Province of the
EASTERN CAPE
DEPARTMENT OF EDUCATION

MATHEMATICS

PLANNING DOCUMENT

for

INTERMEDIATE AND SENIOR PHASES

NOVEMBER 2008

PREFACE

The Eastern Cape Department of Education, Curriculum Chief Directorate in collaboration with the District curriculum personnel developed this document to support teachers planning, teaching and assessment for effective implementation of the National Curriculum Statement in the GET Band.

The document contains exemplars of work schedules, lesson plans and assessment tasks. The document is prepared with the intention to give necessary guidance for planning for teaching at the beginning of the next academic year.

This document must be used as a guide in collaboration with the following documents: National Curriculum Statement. NCS Teachers Guide National Assessment Policy, Provincial Assessment Guidelines, Foundations for Learning Assessment Framework as well as the Learner Attainment Targets documents

It is a guide to assist teachers in planning. An exemplar is an illustration of how planning could be done, it is not cast on stone. Critical engagement with the document is encouraged. Inputs, suggestions and recommendations that will strengthen this document are most welcome.

Contact Details
Ms. N. Dabula

040 608 4586

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SENIOR PHASE LEARNING PROGRAMME

GRADE	LEARNING OUTCOMES AND ASSESSMENT STANDARDS	INTEGRATION	CONTENT IN CONTEXT	RESOURCES
LO1- NUMBERS, OPERATIONS AND RELATIONSHIPS				
7	**LO1- NUMBERS, OPERATIONS AND RELATIONSHIPS** **CLUSTER 1** **7.1.1-** Counts forwards and backwards in the following ways: • In decimal intervals; • In integers for any intervals **7.1.2-** Describes and illustrates the historical and cultural development of numbers (e.g. integers, common fractions) **7.1.3-** Recognises, classifies and represents the following numbers in order to describe and compare them: • *integers* • *decimals (to at least three decimal places), fractions and percentages;* • *factors including prime factors of 3-digit whole numbers;* • *numbers in exponential form including squares of natural numbers to at least 12^2, cubes of natural numbers to at least 5^3, and their square and cube roots.* 7.1.4**-** Recognises and uses equivalent forms of rational numbers listed above,	**WITHIN** **LO2- Patterns, Functions and Algebra.** 7.2.1 Investigates and extends numeric and geometric patterns looking for a relationship or rules , including patterns: • *represented in physical or diagrammatic form ;* • *Not limited to sequences involving constant difference or ratio;* • *found in natural and cultural contexts ;* • *of the learner's own creation;* • *represented in tables* 7.2.2 Describes, explains and justifies observed relationships or rules in own words.	Counting in: decimal intervals and integers Description and illustration of numbers. Recognition, classification and representation of numbers in order to describe them. Recognition and use of equivalent forms of rational numbers. Recognition, description	Fraction diagrams & walls Bottle tops Matchsticks Calculators Thermometer Watch Rulers Tape measures Bathroom scale Maths set Wall charts.

	including: • *common fractions* • *decimals* • *percentages.*		and use of: equivalent fractions commutative associative distributive properties	
8	CLUSTER 1 8.1.1- Describes and illustrates the historical development of numbers (e.g. irrational numbers) 8.1.2- Recognises, classifies and represents the following numbers in order to describe and compare them: • *Integers* • *Decimals, fractions and percentages* • *Numbers written in exponential form including squares and cubes of natural numbers and their square and cube roots;* • *Large numbers in scientific notation;* • *Additive and multiplicative inverses;* • *Multiples and factors;* • *Irrational numbers in the context of measurement (e.g. π and square and cube roots of non-perfect squares and cubes.* 8.1.3- Recognises and uses equivalent forms of the rational numbers listed above	**Within** **LO 4 Measurement** 8.4.3 Solves problems using a range of strategies including: • *Estimating* • *Calculating to at least 2 decimal places.* • *Using and converting between appropriate S.I units.* 8.4.4 Describes the meaning of and uses pi in calculations involving circles and discusses its historical development in measurement.	Description and comparison of irrational Numbers Decimals, fractions and percentages S.I units Conversions Exponents Additive and multiplicative inverses Multiples and factors Basic operations with Rational numbers	Number-lines Magazines Number grids News papers Measuring instruments.
9	**CLUSTER 1** **9.1.1-** Describes and illustrates the historical development of number systems in a variety of historical and cultural context (including local). **9.1.2-** Recognises, uses and represents rational numbers (including very small	**WITHIN** **LO5-Data handling** **9.5.5**- Critically reads and interprets data with awareness of sources of error and manipulations to draw conclusions and make predictions about: • *social environment and*	Description and illustration of historical development of numbers. Recognition and representation of rational	Text books Internet

	numbers written in scientific notation), moving flexibly between equivalent forms in appropriate contexts.	*political issues (e.g. crime, national expenditure, conservation, HIV/AIDS);* • *characteristics of target groups (e.g. age, gender, race, socio - economic groups);* • *attitudes or opinions of people on issues (e.g. smoking, tourism, sport);* • *any other human rights issues and inclusivity issues.* **ACROSS: FAL** **LO4- Writing.** **9.4.1**- Writes to communicate information: • writes longer texts of several paragraphs describing processes and procedures, giving explanations, giving advantages and disadvantages, arguing for and against; • writes texts that includes graphs and statistics; • does a survey and writes it up (e.g. as a report or a newspaper article); • writes text types required in other Learning Areas (e.g. an explanation of how a circuit works for Technology).	numbers.	
7	**CLUSTER 2**	**WITHIN**	Solving problems that involve:	Stationery, Calculator.

	7.1.5- Solves problems in context including contexts that may be used to build awareness for other Learning Areas, as well as human rights, social, economic and environmental issues such as: • *financial(including profit and loss, budgets, accounts, loans, simple interest, hire purchase, exchange rates);* • *measurements in Natural Sciences and Technology contexts* **7.1.6**- Solves problems that involve ratio and rate.	**LO4-Measurement.** 7.4.3- Solves problems using a range of strategies including : • *estimating ;* • *calculating to at least 2 decimal places ;* • *using and converting between appropriate S.I. units.* **ACROSS: EMS** **LO3- Managerial, Consumer, Financial Knowledge and Skills.** **7.3.3-** Completes source documents (e.g. receipts, deposit slips, cheques) and records elementary cash transactions in a statement of receipts and payments**.**	Financial issues, Ratio; Rate	Money
8	CLUSTER 2 8.1.4- Solves problems in context including context that may be used to build awareness of other Learning Areas, as well as human rights, social, economic and environmental issues such as: • Financial (including profit and loss, budget, accounts, loans, simple and, hire purchase, exchange rates. • Measurements in Natural Sciences and Technology contexts. 8.1.5- Solves problems that involve ratio and rate.	**Within** **LO 4 Measurement** 8.4.1- Solves more complex problems involving time, including relating time distance and speed. **Across: EMS** **LO 3** 8.3.6- Investigates the various methods of savings and investments (e.g. savings accounts, fixed deposits, shares, unit trusts), and calculates the returns on a variety of investments.	Problem solving involving finances, ratio and rate and measurement..	Text book Newspapers Magazines Banking statements and slips.

9	**CLUSTER 2** **9.1.3-** Solves problems in context including contexts that may be used to build awareness for other Learning Areas, as well as human rights, social, economic and environmental issues such as: • *financial(including profit and loss, budgets, accounts, loans, simple and compound interest, hire purchase, exchange rates, commissions, rentals and banking);* • *measurements in Natural Sciences and Technology contexts* **9.1.4**- Solves problems that involve ratio, rate and proportion (direct and indirect).	**WITHIN** **LO4-Measurement.** **9.4.1-**Solves ratio and rate problems involving time, distance and speed. **ACROSS: EMS** **LO3-Managerial, Consumer and Financial Knowledge and Skills.** **9.3.3-** Completes cash and credit transactions in the books of service and retail businesses: • uses cash receipts and payment journal, and a debtors' and creditors' journal; • posts journals to the general ledger and draws up a trial balance.	Problem solving including profit and loss, budgets, hire purchase, accounts, compound and simple interest, direct and indirect proportion and finances.	Text book Bank statements Newspapers Magazines Catalogues Deposit slips TV
7	**CLUSTER 3** 7.1.7 Estimates and calculates by selecting and using operations appropriate to solving problems that involve: • *Rounding off numbers to at least one decimal place;* • *Multiple operations with integers ;* • *Addition, subtraction and multiplication of common fractions.* • *Addition, subtraction and multiplication of positive decimals to at least 2 decimal places;* • *Division of positive decimals with at least 3 decimal places by whole numbers;* • *Finding percentages ;*	**WITHIN** **L04- Measurement.** 7.4.3- Solves problems using a range of strategies including : • estimating **ACROSS: FAL** **LO5- Thinking and Reasoning.** **AS1-** Uses language and literacy across the curriculum: • *understands some concepts from other Learning Areas and uses the vocabulary*	Estimations and calculations using operations: Integers, common fractions, Rounding off to one decimal place.	Number grid Fraction diagrams Calculator

	• *Exponents* 7.1.8 Performs mental calculations involving squares of natural numbers to at least 10^2 and cubes of natural numbers to at least 5^3. 7.1.10 Uses a range of strategies to check solutions and judges the reasonableness of solutions.	*associated with them in the additional language (e.g. 'trade' in Economic and Management Sciences);* • *understands and produces texts used in other Learning Areas (e.g. the factual description in Geography or a report in Natural Sciences).*	Mental calculations involving squares to at least 10^2 and cubes to at least 5^3 Calculations using a range of techniques.	
8	CLUSTER 3 8.1.6 - Estimates and calculates by selecting and using operations appropriate to solving problems that involve: • *Rounding off* • *Multiple operations with rational numbers (including division with fraction and decimals)* • *Exponents* 8.1.8 - Uses a range of strategies to check solutions and judges the reasonableness of solutions.	**WITHIN** **LO4- Measurement** 8.4.3- Solves problems using a range of strategies including: • *Estimating;* • *Calculating to at least 2 decimal places;* • *Using and converting between appropriate S.I. units.*	Rounding off; Operations with rational numbers; exponents	Calculator; Stationery; Activity book
9	**CLUSTER 3** **9.1.5**-Estimates and calculates by selecting and using operations appropriate to solving problems and judges the reasonableness of results(including measurement problems that involve rational approximations of irrational numbers) **9.1.6**- Uses a range of techniques and tools	**WITHIN** **LO2-Patterns,functions and algebra** **9.2.8-**Uses the laws of exponents to simplify expressions and solve equations. **ACROSS: FAL** **LO5- Thinking and Reasoning.** **9.5.1-** Uses language and literacy	Estimates and calculates by selecting and using operations appropriate to solving problems.	Text book Bank statements Newspapers Magazines Catalogues Deposit slips TV

	(including technology) to perform calculations efficiently and to the required degree of accuracy, including the following laws and meaning of exponents (the expectation being that learners should be able to use these laws and meanings in calculations only): • $x^n \times x^m = x^{n+m}$ • $x^n \div x^m = x^{n-m}$ • $x^0 = 1$ • $x^{-n} = 1/x^n$	across the curriculum: • *understands some certain concepts from other Learning Areas and uses the vocabulary associated with them in their additional language(e.g. xenophobia in Social Science);* • *writes texts required in other Learning Areas (e.g. reports and explanations in Natural Sciences);* • *produces visual or graphic material to support texts (e.g. diagrams for explanations and reports).*		
7	CLUSTER 4 **7.1.9** Uses a range of techniques to perform calculations including : • using the commutative , associative and distributive properties with positive rational numbers and zero; • Using a calculator. **7.1.11**.Recognises , describes and uses : • *fractions algorithms for finding equivalent;* • *the commutative , associative and distributive properties with positive rational numbers and zero. (The expectation is that learners should be able to use these properties and not necessarily to know the names of properties.)*	**WITHIN** **LO2- Patterns, Functions and Algebra.** **7.2.2**- Describes, explains and justifies observed relationships or rules in own words. **ACROSS: FAL** **LO2- Speaking.** **7.2.3-** Shows developing ability to use features of spoken language to communicate: word stress, weak vowels, intonation and rhythm.	Recognition, description and use of mental calculation using commutative , associative and distributive properties of numbers. Using a calculator Equivalent fractions; Properties of positive rational numbers	Stationery. Calculator
8	CLUSTER 4 8.1.7 - Uses a range of techniques to perform calculations including : • *Using commutative , associative and*	**WITHIN** **LO4- Measurement** 8.4.3- Solves problems using a range	Recognition , description and use of: commutative , associative and distributive properties	Charts Calculators

	distributive properties with rational numbers ; • *using a calculator.* 8.1.9-Recognises , describes and uses : algorithms for finding equivalent fractions the commutative, associative and distributive properties with rational numbers (the expectation is that learners should be able to use these properties and not necessarily to know the names of properties).	of strategies including : • *estimating* • *calculating to at least 2 decimal places ;* • *using and converting between appropriate S.I.units.*	algorithms Using calculators	
9	**<u>CLUSTER 4</u>** **9.1.7-** Recognises, describes and uses the properties of rational numbers.	**<u>WITHIN</u>** **LO4- Measurement** 9.4.1- Solves ratio and rate problems involving time, distance And speed. **<u>ACROSS</u>: FAL** **LO2-Speaking.** **9.2.3-** Shows developing ability to use features of spoken language to communicate: word stress, weak vowels, intonation and rhythm.	Recognition, uses and representation of rational numbers.	Stationery Calculator

LO2- PATTERNS, FUNCTIONS AND ALGEBRA				
7	**CLUSTER 1** **7.2.1**- Investigates and extends numeric and geometric patterns looking for a relationship or rules, including patterns: • *represented in physical or diagrammatic form.* • *not limited to sequences involving constant difference or ratio.* • *found in natural and cultural contexts;* • *of the learner's own creation.* • *represented in tables.* **7.2.2**- Describes, explains and justifies observed relationships or rules in own words.	**WITHIN** **LO1- Numbers, Operations and Relationships**. **7.1.4** Recognises and uses equivalent forms of rational numbers listed above, including: • *common fractions* • *decimals* • *percentages.* **ACROSS:NS** **LO2-Constructing Science Knowledge.** **7.2.3-**Interprets information: interprets information identifying key ideas in text, finding patterns in recorded data, and making inferences from information in various forms (e.g. pictures, diagrams, text).	Investigation and extension of numeric and geometric patterns to find relationships and to formulate rules.	Matchsticks Calculator Poster paper Koki pens Retail products
8	CLUSTER 1 8.2.1- Investigates and extends numeric and geometric patterns looking for relationship or rules, including patterns: • *represented in physical and diagrammatic form.* • *Not limited to sequences involving constant difference or ratio.*	**Within**: **LO3: Space and Shape** 8.3.9- Locates position on co-ordinate systems (ordered grids), Cartesian plane (first quadrant) and maps, and describes how to move	Investigation of numeric and geometric patterns Flow diagrams Formulae Equations and Mathematical Modelling Graphs	Matchsticks Calculator Poster paper Koki pens Retail products

	• *Found in natural and cultural contexts.* • *Of the learner's own creation.* • *Represented in tables.* • *Represented algebraically.* 8.2.2 - Describes, explains and justifies observed relationships or rules in own words or in algebra.	between positions using: • *Horizontal and vertical change;* • *Ordered pairs;* • *Compass directions* **Across: NS** **LO2** 8.2.3- Interprets information by translating tabulated data into graphs, by reading data off graphs, by making predictions from patterns		
9	**CLUSTER 1** 9.2.1- Investigates, in different ways, a variety of numeric and geometric patterns and relationships by representing and generalizing them, and by explaining and justifying the rules that generate them(including patterns of the learner's own creation)	**Within**: **LO1- Numbers, Operations and Relationships**. **9.1.5**-Estimates and calculates by selecting and using operations appropriate to solving problems and judges the reasonableness of results(including measurement problems that involve rational approximations of irrational numbers) **Across: Arts & culture** **LO4: Expressing and communicating.** **Dance as a discipline** 9.4.1- Explains how dance is shaped by and reflects the value of the times and is influenced by music, place, fashion and technology.	Investigation of numeric and geometric patterns	Graph papers Text books Examples from garments and other relevant sources. Charts
7	**CLUSTER 2** 7.2.3 Represents and uses relationships between variables in order to determine	**WITHIN** **LO1- Numbers, Operations and**	Representation and use of input and/ or output values in a variety of	Magazines Strings Paper strips

	input and/or output values in a variety of ways using : • *Verbal descriptions* • *Flow diagrams* • *Tables* 7.2.4 Constructs mathematical models that represent, describe and provide solutions to problem situations, showing responsibility toward the environment and the health of others (including problems within human rights, social , economic , cultural and environmental contexts). 7.2.5 Solves or completes number sentences by inspection or by trial- and-improvement , checking the solutions by substitution (e.g. 2 x Π -8 = 4)	**Relationships**. 7.1.9 Uses a range of techniques to perform calculations including : • *Using commutative, associative and distributive properties with positive rational numbers and zero.* **<u>ACROSS</u>: TECH** LO 1 AS: Chooses possible solutions ,gives sensible reasons for choice , and develops the chosen idea using graphics or modelling techniques .	ways. Construction of mathematical models that represent, describes and provide solutions to problem situations. Problem solving by inspection or trial and improvement.	Mathematical instruments set
8	<u>CLUSTER 2</u> 8.2.3- Represents and uses relationships between variables in order to determine input and/or output values in a variety of ways using: • *Verbal descriptions* • *Flow diagrams* • *Tables* • *Formulae and equations* 8.2.4- Constructs mathematical models that represent, describe and provide solutions to problem situations, showing responsibility to the environment and the health of others (including problems within human rights, social, economic, cultural and environmental contexts).	**LO 5 Data handling.** 8.5.8 Draws a variety of graphs by hand/technology to display and interpret data including: • *Bar graphs and double bar graphs* • *Histograms with given and own intervals;* • *Pie charts* • *Line and broken-line graphs;* • *Scatter plots* **Across: NS** **LO2** 8.2.3- Interprets information by translating tabulated data into	Representation and use of input and/ or output values in a variety of ways. Problem-solving involving equations.	Text book Newspapers Magazines Graph paper

	8.2.5- Solves equations by inspection, trial-and-improvement or algebraic processes (additive and multiplicative inverses), checking the solution by substitution	graphs, by reading data off graphs, by making predictions from patterns	Graphical representation of a problem situation. .	
	CLUSTER 2 **9.2.2**- Represents and uses relationship between variables in order to determine input and/or output values in a variety of ways using : • *verbal descriptions;* • *flow diagrams;* • *tables;* • *formulae and equations.* 9.2.3- Constructs mathematical models that represent, describes and provide solutions to problem situations, showing responsibility toward the environment and the health of others (including problems within human rights, social, economic, cultural and environmental contexts). 9.2.4- Solves equations by inspection, trial-and-improvement or algebraic process (additive and multiplicative inverses, and factorization), checking the solution by substitution.	**Within**: **LO1- Numbers, Operations and Relationships**. **9.1.5**-Estimates and calculates by selecting and using operations appropriate to solving problems and judges the reasonableness of results(including measurement problems that involve rational approximations of irrational numbers)	Problem solving involving equations Constructions of mathematical models that represent, describes and provide solutions to problem situations.	Books Magazines Internet Newspapers
7	**CLUSTER 3** 7.2.6 Describes a situation by interpreting a graph of the situation, or draws a graph from a description of a situation (e.g. height of a roller – coaster car over time; the speed of a racing car going around a track).	**WITHIN** **LO3-Space and Shape.** **7.3.4-**Designs and uses nets to make models of geometric solids studied up to and including this grades. **ACROSS: NS** **LO2- Constructing Science**	Graph interpretation.	Graph Books Papers

		Knowledge. **7.2.3-**Interprets information: Interprets information identifying key ideas in text, finding patterns in recorded data, and making inferences from information in various forms (e.g. pictures, diagrams, text).		
8	CLUSTER 3 8.2.6 - Describes a situation by interpreting a graph of the situation, or draws a graph from a description of a situation, with special focus on trends and features such as: • *Linear or non-linear* • *Increasing or decreasing* • *Maximum/minimum* • *Discrete or continuous.*	**Within** **LO 5 Data handling.** 8.5.8- Draws a variety of graphs by hand/technology to display and interpret data including: • *Bar graphs and double bar graphs* • *Histograms with given and own intervals;* • *Pie charts* • *Line and broken-line graphs;* • *Scatter plots*	Interpretation of graphs.	Text book Newspapers Magazines Graph paper
9	**CLUSTER 3** 9.2.5- Draws graphs on the Cartesian plane for given equations (in two variables), or determines equations or formulae from given graphs using tables where necessary.	**WITHIN** **LO5- Data Handling** 9.5.4- Draws a variety of graphs by hand/technology to display and interpret data including: • *Bar graphs and double bar graphs* • *Histograms with given and own intervals* • *Pie charts* • *Line and broken-line graphs* • *Scatter plots.*	Problem solving involving equations	Books Magazines Internet Newspapers
7	CLUSTER 4 7.2.7 Determines, analyses and interprets the equivalence of different descriptions of	**WITHIN** **LO1- Numbers, Operations and**	Determination and representation of input and output values:	Worksheets Wall charts Various texts

	the same relationship or rule presented: • *Verbally* • *In flow diagrams* • *In tables* • *By equations or expressions* In order to select the most useful representation for a given situation	**Relationships**. 7.1.1 Counts backwards and forwards in the following ways: • *In decimal intervals* • *in integers for any intervals.* **<u>ACROSS</u>: LO** LO 3 AS : Critically evaluates own study skill strategies	verbally, in flow diagrams and tables in order to formulate rules.	
8	<u>CLUSTER 4</u> 8.2.7 - Determines, analyses and interprets the equivalence of different descriptions of the same relationship or rule presented: • *Verbally* • *In flow diagrams* • *In tables* • *By equations or expressions in order to select the most useful representation for the given situation.*	**Within:** **LO2: Patterns, Functions and Algebra.** 8.2.3 -Represents and uses relationships between variables in order to determine input and/or output values in a variety of ways using: • *Verbal descriptions* • *Flow diagrams* • *Tables* • *Formulae and equations*	Representation of a given situation in equivalent forms.	Text book Newspapers Magazines Graph paper
9	<u>CLUSTER 4</u> 9.2.6- Determines, analyses and interprets the equivalence of different descriptions of the same relationship or rule presented: • *Verbally* • *In flow diagrams* • *In tables* • *By equations or expressions* • *By graphs on the Cartesian plane in order to select the most useful representation for a given situation.*	**<u>WITHIN</u>** **LO1-Numbers, operations and relationships.** **AS5**-Estimates and calculates by selecting and using operations appropriate to solving problems and judges the reasonableness of results (including measurement problems that involve rational approximations of irrational numbers).	Determination, analyses and interpretation of different descriptions using flow diagrams and graphs on a Cartesian plane	Graph papers Text books Examples from garments and other relevant sources. Charts

		ACROSS: EMS **LO2-Sustainable Growth and Development.** **AS1-**Discusses how the national budget is used to influence growth and redress economic inequalities.		
7	CLUSTER 5 NO ASSESSMENT STANDARDS			
8	**CLUSTER 5** 8.2.8 -Uses conventions of algebraic notation and the commutative, associative and distributive laws to: • *Classify terms as like and unlike, and to justify the classification.* • *Collect like terms.* • *Multiply or divide an algebraic expression with one, two or three terms by a monomial.* • *Simplify algebraic expressions given in bracket notation, involving one or two sets of brackets and two kinds of operations.* • *Compare different representations of algebraic expressions involving one or more operations, selecting those which are equivalent and justifying own choice.* • *Write algebraic expressions, formulae or equations in simpler or more useful equivalent forms in context.* 8.2.9- Interprets and uses the following basic algebraic vocabulary in context : term , expression , coefficient (or index) , base , constant , variable , equation , formula	**Within:** **LO 1: Numbers, operations and relationships.** **8**.1.7 Uses arrange of techniques to perform calculations including: • Using the commutative, associative and distributive properties with rational numbers. • Using a calculator. **LO 4: Measurement** 8.4.2 Solves problems involving: • Length • Perimeter • Area/ surface area • Volume of rectangular prisms and cylinders	Conventions of algebraic notation. Commutative, associative and distributive laws. Algebraic terminology Solve equations by inspection. Use substitution to check solutions word problems Formulae	Magazines Newspapers Books

	(or rule)			
9	CLUSTER 5 9.2.7- Uses the distributive law and manipulative skills developed in Grade 8 to : • *Find the product of two binomials* • *Factorise algebraic expressions (limited to common factors and difference of squares)* 9.2.8- Uses the laws of exponents to simplify expressions and solve equations . 9.2.9- Uses factorisation to simplify algebraic expressions and equations.	**WITHIN** **LO1-Numbers, operations and relationships.** **9.1.5**-Estimates and calculates by selecting and using operations appropriate to solving problems and judges the reasonableness of results(including measurement problems that involve rational approximations of irrational numbers)	Product of two binomials Factorising algebraic expressions Laws of exponents Solving equations Simplifying algebraic expressions and equations	Maths set Books
LO3- SPACE AND SHAPE				
7	**CLUSTER 1** 7.3.1 Recognises, visualises and names geometric figures and solids in natural and cultural forms and geometric settings , including those previously dealt with as well as focussing on ; • *similarities and differences between different polyhedra ;* • *Similarities and differences between all quadrilaterals including kites and trapeziums.* 7.3.2 In contexts that include those that may be used to build awareness of social , cultural and environmental issues , describes and classifies geometric figures and solids in terms of properties , including : • *faces, vertices and edges;* • *sides and angles of polygons (with focus on , but not on limited to, triangles and quadrilaterals);* • *parallel and perpendicular sides.*	**WITHIN** **L04- Measurement.** 7.4.6 -Describes interrelationships between perimeter and area of geometric figures **ACROSS: TECH** LO 1 AS : Chooses and uses appropriate tools and materials to make products by measuring, marking, cutting o r separating shaping or forming, joining or combining and finishing different materials with some accuracy	Exploring geometric shapes Similarities and differences between different polyhedra, quadrilaterals. Classification of geometric figures and solids in terms of properties.	Models Different types of quadrilaterals Nets Wall charts

	7.3.3 Uses a pair of compasses, ruler and protractor to accurately construct geometric figures for investigation of own property and designs of nets. 7.3.4- Designs and uses nets to make models of geometric solids studied up to and including this grade.			
8	**CLUSTER 1** 8.3.1 -Recognises, visualises and names geometric figures and solids in natural and cultural forms and geometric settings, including: • *Those previously dealt with.* • *The platonic solids (tetrahedron, cube, octahedron, dodecahedron, icosahedrons).* 8.3.2 -In contexts that include those that may build awareness of social, cultural and environmental issues, describes and classifies geometric figures and solids in terms of properties, including: • *Sides, angles and diagonals and their interrelationships with focus on triangles and quadrilaterals (e.g. types of triangles and quadrilaterals*). 8.3.4- Uses a pair of compasses, ruler and protractor to accurately construct geometric figures for investigation of own property and design of nets. 8.3.5- Design and uses nets to make a model of geometric solids studied up to and including this grade.	**Within :** **LO4- Measurement** 8.4.8- Investigates (alone and /or as a member of a group or team) the relationship between the sides of a right-angled triangle to develop the Theorem of Pythagoras. **Across: Technology** **LO 1:** **Technological processes and skills** 8.1.9- Develops a plan for making that outlines all the following: • *Sketches showing the necessary dimensions or quantities.*	Investigation of relationship between the angles and sides of 2-dimensional shapes and 3-dimensional objects. Geometric shapes in natural and cultural forms. Regular and irregular polygons and polyhedron, together with their properties, as well as models of solids. Differentiate between 2Ds and 3Ds	Text book Newspapers Magazines Graph paper Examples of 2D and 3D objects Mathematical instruments Artifacts with Geometric patterns
	CLUSTER 1 9.3.1- Recognizes, visualizes and names	. **WITHIN** **LO2- Patterns, functions and**	Geometric shapes in natural and cultural forms. Regular and irregular	Examples of 2D shapes and 3D objects

	geometric figures and solids in natural and cultural forms and geometric settings, including: • *Regular and irregular polygons and polyhedra* • *Spheres* • *Cylinders* 9.3.4- Draws and/or constructs geometric figures and makes models of solids in order to investigate and compare their properties and model situations in the environment.	**algebra** **AS3-** Constructs mathematical models that represent, describe a solution to problem situations, showing responsibility toward environment and the health of others (including problems within human rights, social, economic, cultural and environmental contexts). **Across:** **Technology** **LO 1:** **Technological processes and skills** 9.1.1 Presents ideas (in a project portfolio) using formal drawing techniques, in two-dimensional and three-dimensional sketches, circuit diagrams or systems.	polygons and polyhedron, together with their properties, as well as models of solids.	Mathematical instruments
7	<u>CLUSTER 2</u> 7.3.5- Uses transformations (rotations, reflections and translations) and symmetry to investigate (alone and /or as a member of a group or team) properties of geometric figures . 7.3.6- Recognises and describes the properties of similar and congruent figures and the difference between them.	**<u>WITHIN</u>** **L04- Measurement.** **AS6-** Describes interrelationships between perimeter and area of geometric figures. **<u>ACROSS</u>: FAL** **LO2- Speaking.** **AS2-** Interacts in additional language: • *uses language for a range*	Transformation (rotation, reflection, and translation) and symmetry to investigate properties of geometric figures. Recognition and description of congruency and similarities in real life context.	Maths set Grid paper Mirror Real objects Graph paper Mathematical instrument set Pins

		of functions: expresses opinions and feelings, makes choices, makes advice and makes suggestions (e.g. ' I think you should…'), etc.; • *takes part in role-plays of different situations involving different kinds of language (e.g. formal and informal telephone conversations).*		
8	**CLUSTER 2** 8.3.6- Uses transformations (rotations, reflections and translations) and symmetry to investigate (alone and/or as a member of a group or team) properties of geometric figures. 8.3.7- Uses proportion to describe the effect of enlargement and reduction on properties of geometric figures.	**Within:** **LO3- Space and Shape** **8**.3.9- Locates positions on co-ordinate systems (ordered grids). Cartesian plane (first quadrant) and maps, and describes how to move between positions using: • *Horizontal and vertical change;* • *Ordered pairs;* • *Compass direction.*	Investigation of properties of geometric shapes by using rotations, reflections and translations and concept of similarity.	Grid paper/Graph paper Tracing paper Compass Text books Maps
9	CLUSTER 2 9.3.2- In contexts that include those that may be used to build awareness of social, cultural and environmental issues, describes the interrelationships of the properties of geometric figures and solids with justification, including: • Congruence and straight line geometry; • Transformations. 9.3.5- Uses transformations, congruence and	**Within:** **LO 4: Measurement** 9.4.4- Uses the Theorem of Pythagoras to solve problems involving missing lengths in known geometric figures and solids. 9.4.2- Solves problems- including problems in contexts that may be used to develop awareness of human rights, social, economic, cultural and	Transformation Congruency and similarity Use of triangles to solve problems	Dotted grid paper Graph paper Mathematical instrument

	similarity to investigate, describe and justify (alone and/ or as a member of a group or team) properties of geometric figures and solids, including tests for similarity and congruence of triangles.	environmental issues- involving known geometric figures and solids in a range of measurement contexts by: • *Measuring precisely and selecting measuring instruments appropriate to the problem;* • *Estimating and calculating with precision;* • *Selecting and using formulae and measurements.*		
7	CLUSTER 3 7.3.7- Draws and interprets sketches of solids from different perspectives 7.3.8- Locates positions on co-ordinate systems (ordered grids) and maps using: • *Horizontal and vertical change* • *Compass directions.*	**WITHIN** **L04- Measurement.** 7.4.7 Describes interrelationships between surface area and volume of geometric solids. **ACROSS: SS** LO 1 (GEO) AS : Uses local maps and/or orthophoto maps to locate and investigate the issue and its context (compares with field observations) [works with sources	Drawing and interpretation of sketches of solids in different perspective Location of positions on co-ordinate systems and maps using compass directions	Drawing and interpretation of sketches of solids in different perspective Grid papers Graph papers
8	**CLUSTER 3** 8.3.8- Draws and interprets sketches of geometric solids from different perspectives with attention to the preservation of properties. **8**.3.9- Locates positions on co-ordinate systems (ordered grids). Cartesian plane (first quadrant) and maps, and describes how to move between positions using:	**Within:** **LO 2- Patterns, Functions and Algebra** **8.2.6** **Describes** a situation by interpreting a graph of the situation, or draws a graph from a description of a situation, with special focus on trends and features such as:	Plotting of points on a Cartesian plane. Transformations (e.g. rotations, reflections and translations)	Graph paper Text books Mathematical instruments Mirrors Tracing paper Transparencies

	• *Horizontal and vertical change;* • *Ordered pairs;* • *Compass direction.*	• *Linear or non-linear* • *Increasing or decreasing* • *Maximum/minimum* • *Discrete or continuous.*		
9	**CLUSTER 3** 9.3.6- Recognizes and describes geometric solids in terms of perspective, including simple perspective drawing. 9.3.7- Uses various representational systems to describe position and movement between positions, including: • *Ordered grids;* • *Cartesian plane (4 quadrants)* • *Compass directions in degrees;* • *Angles of elevation and depression*.	**Within:** **LO 2- Patterns, Functions and Algebra** 9.2.5- Draws graphs on the Cartesian plane for given equations (in two variables), or determines equations or formulae from given graphs using tables where necessary.	Transformation Congruency Use of triangles to solve problems	Dotted grid paper Graph paper Mathematical instrument
7	CLUSTER 4 NO ASSESSMENT STANDARDS			
8	**CLUSTER 4** 8.3.3- Uses vocabulary to describe parallel lines cut by a transversal, perpendicular lines, intersecting lines and triangles in terms of angle relationship. (e.g. vertically opposite, corresponding, co-interior, alternate angles)	**Within** **LO 4 Measurement** 8.4.7- Estimates, compares, measures and draws angles accurate to one degree using protractors.	Investigation of the properties of parallel lines/non-parallel lines and associated angles (alternate, co-interior, corresponding angles) using measurement initially. Designing of geometric solids using nets.	Mathematical instruments. Mathematics kits. Books Internet
9	**CLUSTER 4** 9.3.3- Uses geometry of straight lines and triangles to solve problems and to justify relationships in geometric figures.	**WITHIN** **LO4- Measurement** 9.4.2- Solves problems- including problems in contexts that may be used to develop awareness of human rights, social, economic, cultural and environmental issues-	Transformation Congruency Use of triangles to solve problems	Dotted grid paper Graph paper Mathematical instrument

		involving known geometric figures and solids in a range of measurement contexts by: • *Measuring precisely and selecting measuring instruments appropriate to the problem;* • *Estimating and calculating with precision;* • *Selecting and using formulae and measurements.*		
LO4- MEASUREMENT				
7	**LO4- <u>MEASUREMENT</u>** **<u>CLUSTER 1</u>** 7.4.1- Solve problems involving time, including relating time, distance and speed	**<u>WITHIN</u>** **LO1- Numbers, Operations and Relationships.** **7.1.9**- Uses a range of techniques to perform calculations including: • *using commutative, associative and distributive properties with positive rational numbers and zeros;* • *using a calculator.*	Problem-solving involving time, distance and speed	Calculators Text books Clock
8	**<u>CLUSTER 1</u>** 8.4.1- Solve more complex problems involving time , including relating time , distance and speed	Within 8.1.6 Estimates and calculates by selecting and using operations appropriate to solving problems that involve: • Rounding off; • Multiple operations with rational numbers (including division with fractions and decimals); • Exponents	Problem-solving involving time, distance and speed	Calculators Text books Clock
9	**<u>CLUSTER 1</u>**	**<u>WITHIN</u>**	Problem solving involving	Mathematical

	9.4.1- Solves ratio and rate problems involving time, distance and speed	**LO1- Numbers, Operations and Relationships.** 9.1.4- Solves problems that involve ratio, rate and proportion (direct and indirect).	time, distance and speed.	Instruments Text books
7	**CLUSTER 2** 7.4.3- Solves problems using a range of strategies including : • *estimating ;* • *calculating to at least 2 decimal places ;* • *using and converting between appropriate S.I. units.*	**WITHIN** **LO1- Numbers, Operations and Relationships.** 7.1.7- Estimates and calculates by selecting and using operations appropriate to solving problems ---- **ACROSS: TECH** LO 1 AS: Presents ideas (in a project portfolio) using two dimensional and three dimensional sketches, circuit diagrams or systems diagrams that include most of the following features : • Notes to communicate design reasoning • dimensions	Problem solving including : Time , distance, speed , length , Perimeter and area of polygons Volume and surface area Problem solving, estimation, calculation and conversions between S.I. units. Description and illustration in different contexts.	Watch Rulers Tape measure Prisms Worksheet
8	**CLUSTER 2** 8.4.2- Solves problems involving: • *Length;* • *Perimeter and area of polygons and circles;* • *Volume and surface area of rectangular-based prisms and cylinders.* 8.4.4- Describes the meaning of and uses π in calculations involving circles and	**WITHIN** **LO 3 Space and shape** 8.3.2- In contexts that may be used to build awareness of social, cultural and environmental issues, describes and classifies geometric figures and solids in terms of properties, including: • Sides, angles and diagonals and their	measurement of geometric figures (perimeter, area , total surface area and volumes). Conversions between S.I. units	Mathematical Instruments Calculators Text books 2D and 3D shapes

	discusses its historical development in measurement. 8.4.5- Calculates by selecting and using appropriate formulae : • *Perimeter of polygons and circles ;* • *Area of triangles , rectangles; circles and polygons by decomposition into triangles and rectangles ;* • *Volume of triangular and rectangular –based prisms and cylinders.*	interrelationships, with focus on triangles and quadrilaterals (e.g. types of triangles and quadrilaterals).		
9	**CLUSTER 2** 9.4.2- Solves problems- including problems in contexts that may be used to develop awareness of human rights, social, economic, cultural and environmental issues- involving known geometric figures and solids in a range of measurement contexts by: • Measuring precisely and selecting measuring instruments appropriate to the problem; • Estimating and calculating with precision; • Selecting and using formulae and measurements. 9.4.3- Describes and illustrates the development of measuring instruments and conventions' in different cultures throughout history.	**WITHIN** **LO1- Numbers, Operations and Relationships.** 9.1.5- Estimates and calculates by selecting and using operations appropriate to solving problems and judging the reasonableness of results (including measurement problems that involve rational approximations of irrational numbers).	Problem solving involving time, distance and speed.	Mathematical Instruments Text books
7	**CLUSTER 3** 7.4.2- Solves problems involving: • *length;* • *perimeter and area of polygons ;* • *volume and surface area of rectangular prisms .*	**WITHIN** **LO3-Space and Shape** 7.3.2- In contexts that include those that may be used to build awareness of social, cultural and environmental issues , describes and classifies geometric figures in terms of	Calculations using appropriate formulae in polygons, triangles and quadrilaterals. Description of interrelationship between surface area and volume	2-D shapes 3 D objects Ruler Tape measure Metre stick Dotted paper

	7.4.4- Describes and illustrates ways of measuring in different cultures throughout history, including metric and other formal measuring systems. 7.4.5- Calculates , by selecting and using appropriate formulae : • *perimeter of polygons* • *area of triangles , rectangles and squares.* • *volume of triangular and rectangular based prisms.* 7.4.6- Describes interrelationships between perimeter and area of geometric figures. 7.4.7- Describes interrelationships between surface and volume of geometric solids.	properties including :* sides and angles of polygons (with focus on , but not limited to, triangles and quadrilaterals) ; • *parallel and perpendicular sides.* **<u>ACROSS</u>: TECH** LO 1 AS : Chooses and uses appropriate tools and materials to make products by measuring, marking, cutting o r separating shaping or forming, joining or combining and finishing different materials with some accuracy		
8	CLUSTER 3 8.4.3- Solves problems using a range of strategies including: • *Estimating;* • *Calculating to at least 2 decimal places;* • *Using and converting between appropriate S.I. units .* 8.4.6- Converts between: • $mm^2 \leftrightarrow cm^2 \leftrightarrow m^2 \leftrightarrow km^2$ • $mm^3 \leftrightarrow cm^3 \leftrightarrow m^3$ • $ml\ (cm^3) \leftrightarrow l \leftrightarrow kl$	**<u>WITHIN</u>** **LO4- Measurement** 8.1.6 - Estimates and calculates by selecting and using operations appropriate to solving problems that involve: • *Rounding off* • *Multiple operations with rational numbers (including division with fraction and decimals)* • *Exponents*	Problem solving using a range of strategies. measurement of geometric figures (perimeter, area , total surface area and volumes). Conversions between S.I. units	Mathematical Instruments Calculators Text books 2D shapes and 3D objects
9	**<u>CLUSTER 3</u>** 9.4.4- Uses the Theorem of Pythagoras to solve problems involving missing lengths in known and solids	**<u>WITHIN</u>** **LO3-Space and Shape.** 9.3.3- Uses geometry of straight lines and triangles to solve problems and to justify relationships in geometric	Use of Pythagoras Theorem to solve problems.	Text books Mathematical set

		figures.		
7	**CLUSTER 4** 7.4.8- Classifies angles into acute, right, obtuse, straight, reflex or revolution 7.4.9- Estimates, compares, measures and draws angles accurate to one degree using protractors.	**WITHIN** **LO3-Space and Shape.** 7.3.1 Recognises, visualises and names geometric figures and solids in natural and cultural forms and geometric settings , including those previously dealt with as well as focussing on ; • *similarities and differences between different polyhedra ;* • *Similarities and differences between all quadrilaterals including kites and trapeziums.*	Classification, estimation and drawing of different angles.	Mathematical instrument set Watch Wall charts
8	**CLUSTER 4** 8.4.8- Investigates (alone or as a member of a group or team) the relationship between the sides of a right-angled triangle in order to develop the Theorem of Pythagoras. 8.4.9- Uses the Theorem of Pythagoras to calculate a missing length in a right-angled triangle leaving irrational answers in surd form ($\sqrt{}$) 8.4.10- Describes and illustrates ways of measuring in different cultures throughout history (e.g. determining the right- angles using knotted string, leading to the Theorem of Pythagoras.	**Within** **LO 3 Space and shape** 8.3.2 In contexts that may be used to build awareness of social, cultural and environmental issues, describes and classifies geometric figures and solids in terms of properties, including: Sides, angles and diagonals and their interrelationships, with focus on triangles and quadrilaterals (e.g. types of triangles and quadrilaterals).	Problem-solving using the theorem of Pythagoras.	Mathematical instruments Text books Magazines Graph paper/Square grid paper
9	**CLUSTER 4** **NO ASSESSMENT STANDARDS**			
7	**CLUSTER 5**			

	NO ASSESSMENT STANDARDS			
8	**CLUSTER 5** 8.4.7- Estimates, compares, measures and draws angles accurate to one degree using protractors.	**WITHIN** **LO3-Space and Shape** 8.3.4- Uses a pair of compasses, ruler and protractor to accurately construct geometric figures for investigation of own property and design of nets.	Constructions	Graph paper; Text books; Mathematical instruments.
9	**CLUSTER 5** **NO ASSESSMENT STANDARDS**			
LO5- DATA HANDLING				
7	**LO5- DATA HANDLING** **CLUSTER 1** **7.5.1-** Poses questions relating to human rights, social, economic, environmental and political issues in own environment. **7.5.2-** Selects appropriate resources for the collection of data (including peers, family, newspapers, books, magazines). **7.5.3-** Uses simple questionnaires (with a variety of possible responses) and designs and uses questionnaires (with yes/no type responses) in order to collect data (alone and/or as members of a group or team) to answer questions. **7.5.4-** Distinguishes between samples and populations and suggests appropriate samples for investigations (including random samples). **7.5.5**- Organises (including grouping where appropriate) and records data using tallies, tables and stem-and-leaf displays.	**WITHIN** **LO1- Numbers, Operations and Relationships.** **7.1.5-** Solves problems in context including contexts that may be used to build awareness for other Learning Areas, as well as human rights, social, economic and environmental issues such as: • *financial(including profit and loss, budgets, accounts, loans, simple interest, hire purchase, exchange rates);* • *measurements in Natural Sciences and Technology contexts* **ACROSS: NS** **LO1- Scientific investigation.** **7.1.2-** Conducts investigations and collects data,organises and uses equipment or sources to gather and record information.	Data collection and recording Selection and use of appropriate methods to collect data. Design questionnaires Data collection information. Records data using tallies , stem and leaf displays Mean, median and mode Samples and populations Use of questionnaire to collect data, record using tables and stem-and –leaf displays	Tallies and tables; Stationery.

8	**CLUSTER 1** CLUSTER 1 8.5.1- Poses questions relating to human rights, social, economic, environmental and political issues in own environment. 8.5.2- Selects, appropriate sources of data (including peers, family, news papers, books, magazines, the internet). 8.5.3- Designs and uses questionnaires with a variety of possible responses in order to collect data (alone and/or as a member of a group or team) to answer questions. 8.5.4- Performs simple experiments using random number generators, coins, spinners, dice and cards in order to collect data. 8.5.5- Organises (including grouping where appropriate) and records data using tallies, tables and stem-and-leaf displays.	**Within** **LO1** 8.1.4- Solves problems in context including contexts that be used to build awareness of other Learning Areas , as well as human rights , social, economic, and environmental issues such as : • financial (including profit and loss , budgets, accounts , loans , simple interest, hire purchase, exchange rates); **NS** LO 1 AS : Conducts investigations and collects data : Organises and uses equipment or sources to gather and record information **Across** **1st Additional Language** **LO 5: Thinking and reasoning**. 8.5.3- Collects and records information in different ways: • Transfers information from one mode to another by, for example, using mind maps.	Design questionnaires Data collection information. Records data using tallies , stem and leaf displays Mean, median and mode	Books Magazines Data Generators e.g. dice, spinners.
9	**CLUSTER 1** 9.5.1- Poses questions relating to human rights, social, economic, environmental and political issues in South Africa.	**WITHIN** **LO1- Numbers, Operations and Relationships.** **9.1.3-** Solves problems in context	Selection and use of appropriate methods to collect data,	Magazines Books

	9.5.2- Selects, justifies and uses appropriate methods for collecting data (alone and/or as a member of a group or team) which include questionnaires and interviews, experiments, and sources such as books, magazines and the Internet in order to answer questions and thereby draw conclusions and make predictions about the environment. 9.5.3- Organizes numerical data in different ways in order to summarize by determining: • Measures of central tendency • Measures of dispersion	including contexts that may be used to build awareness of other Learning Areas , as well as human rights, social economic and environmental issues such as : • Financial (including profit and loss, budgets , accounts , loans, simple and compound interest, hire purchase, exchange rates , commission , rentals and banking). **ACROSS: FAL** **LO 5: Thinking and reasoning**. 9.5.3- Collects and records information in different ways: • Transfers information from one mode to another.		
7	**CLUSTER 2** **7.5.6-** Summarises ungrouped numerical data by determining mean, median and mode as measures of central tendency and distinguishes between them. **7.5.7-** Identifies the largest and smallest scores in a data set and determines the difference between them in order to determine the spread of the data (range). **7.5.8-** Draws a variety of graphs by hand/technology to display and interpret data (grouped and ungrouped) including: • *bar graphs and double-bar graphs* • *histograms with given intervals;* • *pie charts;* • *line and broken-line graphs.*	**WITHIN** **LO3- Space and Shape.** **7.3.7-** Draws and interprets sketches of solids from different perspectives. **ACROSS: SS** **LO1- Historical Enquiry.** **7.1.2-**Compiles and organizes information from a number of sources to obtain evidence about aspects of the past [works with sources].	Determination and identification of central tendency viz.: Median, mode median, range and mean. Drawing of graphs viz.: bar graphs histograms pie charts line and broken line graphs	Graph papers Maths set Charts Calculators Crayons

	7.5.9- Critically reads and interprets data presented in a variety of ways to draw conclusions and make predictions to the role of: • *context (e.g. rural or urban, national or provincial)* • *categories within the data (e.g. age, gender, race);* • *scales used in graphs as a source of error and bias;* • *choice of summary statistics (mean, median or mode);* • *any other human rights issues and inclusivity issues.*			
8	**CLUSTER 2** 8.5.6- Summarizes grouped and ungrouped numerical data by determining mean, median and mode as measures of central tendency and distinguishes between them. 8.5.7- Determines measures of dispersion, including range and extremes. 8.5.8- Draws a variety of graphs by hand/technology to display and interpret data including: • *Bar graphs and double bar graphs* • *Histograms with given and own intervals;* • *Pie charts;* • *Line and broken-line graphs;* • *Scatter plots.* 8.5.9- Critically reads and interprets data presented in a variety of ways in order to draw conclusions and make predictions sensitive to the role of: • *Context (e.g. rural or urban, national*	**WITHIN** **LO 2: Patterns, Functions and Algebra** 8.2.3- Represents and uses relationships between variables in order to determine input and/or output values in a variety of ways using: • *Verbal descriptions* • *Flow diagrams* • *Tables* • *Formulae and equations* **ACROSS:NS** LO 1 AS : Conducts investigations and collects data : Organises and uses equipment or sources to gather and record information	Measures of central tendency: Mean, median and mode. Measures of dispersion: Range and extremes.	Calculators Text books Graph paper Magazines

	or provincial) • *Categories within the data (e.g.age, gender, race);* • *Data manipulation (e.g. grouping, scale, choice of summary statistics) for different purposes;* • *The role of outliers on data distribution;* • Any other human rights and inclusivity issues.			
9	**CLUSTER 2** 9.5.4- Draws a variety of graphs by hand/technology to display and interpret data including: • *Bar graphs and double bar graphs* • *Histograms with given and own intervals* • *Pie charts* • *Line and broken-line graphs* • *Scatter plots.* 9.5.5- Critically reads and interprets data with awareness of sources of error and manipulation to draw conclusions and make predictions about: • *Social, environmental and political issues (e.g. crime, national expenditure, conservation, HIV/AIDS);* • *Characteristics of target groups (e.g. age, gender, race, socio-economic groups);* • *Attitudes or opinions of people on issues(e.g. smoking, tourism, sport);* • *Any other human rights and exclusivity issues.*	**Within:** **LO 3: Space and Shape** 9.3.7- Uses various representational systems to describe position and movement between positions **Across: Life Orientation** **LO 3: Personal Development** 9.3.1- Analyses and reflects on positive personal qualities in a range of context. 9.3.2- Critically discusses own rights and responsibilities in interpersonal relationships. **Social Sciences:** **LO 1: -Geographical Enquiry**:- AS: Analyses and reaches conclusions about information from source such as photos, maps and atlases, graphs and statistics [works with sources]	Data organisation to determine measures of central tendency and dispersion. Drawing of different kinds of graphs to interpret data. Interpretation of data	Graph papers Mathematical set Text books Newspaper Magazine Internet
7	**CLUSTER 3** **7.5.10**-Performs simple experiments where	**WITHIN** **LO1- Numbers, Operations and Relationships.**	Theory of probability: listing possible outcomes and determine relative frequency	Cards Dice Worksheets Coins

	the possible outcomes are equally likely and: • *lists the possible outcomes based on the conditions of the activity;* • *determines the frequency of actual outcomes for a series of trials;* • *determines the relative frequency using the definition of relative frequency (see Mathematics Learning Area Glossary).*	7.1.7 Estimates and calculates by selecting and using operations appropriate to solving problems that involve • *Rounding off numbers to at least one decimal place,* • *Multiple operations with integers ,* • *Addition, subtraction and multiplication of common fractions* **<u>ACROSS</u>: TECHNOLOGY** **LO3-Technology, Society and the Environment.** **7.3.3-**Expresses an opinion that explains how certain groups of society might be favoured or disadvantaged by given products of technology**.**		
8	**<u>CLUSTER 3</u>** 8.5.10- Considers a simple situation (with equally likely outcomes) that can be described using probability and: • *Lists all the possible outcomes;* • *Determines the probability of each possible outcome using the definition of probability;* • *Finds the relative frequency of actual outcomes for a series of trials;* • *Compares relative frequency with probability and explains possible differences;* • *Predicts with reason the relative frequency of possible outcomes for a series of trials based on probability.*	**Within** **LO 1 Numbers, operations and relationships.** 8.1.2- Recognises, classifies and represents the following numbers in order to describe and compare them; • *Decimals, fractions and percentages*	Probability	Dice Coins Spinners Playing cards Text books Lotto
9	**<u>CLUSTER 3</u>** 9.5.6- Considers situations with equally	**Within:**	Probability using two way	Dice

	probable outcomes, and: • *Determines probabilities for compound events using two-way tables and tree diagrams;* • *Determines the probabilities for outcomes of events and predicts their relative frequency in simple experiments;* • *Discusses the differences between the probability of outcomes and their relative frequency.*	**LO 1: Numbers, operations and relationships.** 9.1.4- Solves problems that involve ratio, rate and proportion (direct and indirect).	tables and tree diagrams.	Coins Spinners Playing cards Text books Lotto Worksheets

GRADE 7 WORKSCHEDULE

DURATION	LOs and ASSs	INTEGRATION	CONTENT IN CONTEXT	RESOURCES	ASSESSMENT FORMS; METHODS and TOOLS	TEACHING and LEARNING STRATEGIES
TERM 1						
1ST -3rd week	CLUSTER 1: LO 1 7.1.1 Counts backwards and forwards in the following ways: • In decimal intervals • in integers for any intervals. 7.1.2 Describes and illustrates the historical and cultural development of numbers (e.g. integers, common fractions) 7.1.3 Recognises , classifies and represents the following numbers in order to describe and compare them: • integers • decimals (to at least three decimal places), fractions	Mathematics 7.2.1 Investigates and extends numeric and geometric patterns looking for relationships or rules, including patterns -- represented in physical or diagrammatic form - not limited to sequences involving constant difference or ratio 7.4.3Solves problems using a range of strategies including : • estimating • calculating to at least two decimal places	Counting in: decimal intervals and integers Description and illustration of numbers. Recognition, classification and representation of numbers in order to describe them.	Fraction diagrams & walls Bottle tops Matchsticks Calculators Thermometer Watch Rulers Tape measures Bathroom scale Maths set Wall charts. Number line strips	FORM Daily activities Investigations Tests Assignments METHOD Group assessment Peer assessment Self assessment Teacher assessment TOOLS Checklist Rubric Rating Scale Observation Sheets Memorandum	Cooperative Groups Hot Potato Discussions Zopp Cards

	and percentages ; • factors including prime factors of 3-digit whole numbers; • numbers in exponential form including squares of natural numbers to at least 12^2, cubes of natural numbers to at least 5^3 , and their square and cube roots . 7.1.4 Recognises and uses equivalent forms of the rational numbers listed above ;including ; • common • fractions; • decimals ; • percentages .	• using and converting between appropriate S.I. units	Recognition and use of equivalent forms of rational numbers. Recognition, description and use of: equivalent fractions commutative associative distributive properties			

4^{th} -5^{th} week	<u>CLUSTER 1: LO2</u> 7.2.1 Investigates and extends numeric and geometric patterns looking for a relationship or rules , including patterns:	<u>MATHS</u> <u>LO 1</u> 7.1.1. Counts forwards and backwards in the following ways : • Decimal	Investigation and extension of numeric and geometric patterns to find relationships and to formulate rules.	Multiplication tables Matchsticks	<u>FORM</u> Daily activities Investigations Tests Assignments <u>METHOD</u>	Cooperative Groups Hot Potato Discussions Zopp Card

	.represented in physical or diagrammatic form ; .Not limited to sequences involving constant difference or ratio; . found in natural and cultural contexts ; . of the learner's own creation; . represented in tables 7.2.2 Describes, explains and justifies observed relationships or rules in own words.	intervals • In integers for any intervals <u>ARTS & CULTURE</u> <u>LO 1</u> AS : Learns and performs steps from dances of popular cultures			Group assessment Peer assessment Self assessment Teacher assessment <u>TOOLS</u> Checklist Rubric Rating Scale Observation Sheets Memorandum	
6th week	<u>Cluster 1: LO 3</u> 7.3.1 Recognises, visualises and names geometric figures and solids in natural and cultural forms and geometric settings , including those previously dealt with as well as focussing on ; . similarities and differences between different polyhedra ; . Similarities and differences between all quadrilaterals including kites and trapeziums. 7.3.2 In contexts that include those that may be used to build awareness of social , cultural and environmental issues , describes and	<u>MATHS</u> <u>LO 4</u> 7.4.6 Describes interrelationships between perimeter and area of geometric figures <u>TECH</u> <u>LO 1</u> AS : Chooses and uses appropriate tools and materials to make products by measuring, marking, cutting o r separating shaping or forming, joining or combining and finishing different materials with some accuracy	Exploring geometric shapes Similarities and differences between different polyhedra, quadrilaterals. Classification of geometric figures and solids in terms of properties.	Models Different types of quadrilaterals Nets Wall charts Models Different types of quadrilaterals Nets Wall charts	<u>FORM</u> Daily activities Investigations Tests Assignments <u>METHOD</u> Group assessment Peer assessment Self assessment Teacher assessment <u>TOOLS</u> Checklist Rubric Rating Scale Observation Sheets Memorandum	Cooperative Groups Hot Potato Discussions

	classifies geometric figures and solids in terms of properties , including : . faces, vertices and edges; . sides and angles of polygons (with focus on , but not on limited to, triangles and quadrilaterals); .parallel and perpendicular sides. 7.3.3 Uses a pair of compasses, ruler and protractor to accurately construct geometric figures for investigation of own property and designs of nets. 7.3.4 Designs and uses nets to make models of geometric solids studied up to and including this grade.		Construction of geometric figures and designing of nets to make models			

7th week	CLUSTER 1: LO 4 7.4.1 Solve problems involving time, including relating time, distance and speed. 7.4.2 Solves problems involving: . length; . perimeter and area of polygons ; . volume and surface area of rectangular prisms .	MATHS LO 1 7.1.7 Estimates and calculates by selecting and using operations appropriate to solving problems ---- TECH LO 1	Problem solving including : Time , distance, speed , length , Perimeter and area of polygons Volume and surface area	Watch Rulers Tape measure Prisms Worksheets	FORM Daily activities Investigations Tests Assignments METHOD Group, Peer, Self, and Teacher assessment.	Cooperative Groups Hot Potato Discussions Zopp Card

	7.4.3 Solves problems using a range of strategies including : . estimating ; . calculating to at least 2 decimal places ; . using and converting between appropriate S.I. units. 7.4.4 Describes and illustrates ways of measuring in different cultures throughout history, including metric and other formal measuring systems.	AS: Presents ideas (in a project portfolio) using two dimensional and three dimensional sketches, circuit diagrams or systems diagrams that include most of the following features : *Notes to communicate design reasoning *dimensions	Problem solving, estimation, calculation and conversions between S.I. units. Description and illustration in different contexts.		TOOLS Checklist Rubric Rating Scale Observation Sheets Memorandum	
8th -10th week	CLUSTER 3: LO1 7.1.7 Estimates and calculates by selecting and using operations appropriate to solving problems that involve: Rounding off numbers to at least one decimal place; .Multiple operations with integers ; .Addition, subtraction and multiplication of common fractions. . Addition, subtraction and multiplication of positive decimals to at least 2 decimal places; .Division of positive decimals with at least 3 decimal places by whole numbers; . Finding percentages ; . Exponents	Mathematics 7.4.3 Solves problems using a range of strategies including : *estimating	Estimations and calculations using operations: Integers, common fractions, Rounding off to one decimal place.	Number grid Fraction diagrams & walls Calculator	FORM Daily activities Investigations Tests Assignments METHOD Group assessment Peer assessment Self assessment Teacher assessment TOOLS Checklist Rubric Rating Scale Observation Sheets Memorandum	Cooperative Groups Hot Potato Discussions Zopp Card

	7.1.8 Performs mental calculations involving squares of natural numbers to at least 10^2 and cubes of natural numbers to at least 5^3 7.1.10 Uses a range of strategies to check solutions and judges the reasonableness of solutions.		Mental calculations involving squares to at least 10^2 and cubes to at least 5^3 Calculations using a range of techniques.			
11th week	CLUSTER 1: LO 5 7.5.1 Poses questions relating to human rights, social, economic, environmental and political issues in own environment. 7.5.2 Selects appropriate sources for the collection of data (including peers, family, newspapers, books, magazines). 7.5.3 Uses simple questionnaires (with a variety of possible responses) and designs and uses questionnaires (with yes/no type responses) in order to collect data (alone and/or as a member of a group or team) to answer questions. 7.5.4 Distinguishes between samples and	MATHS LO1 7.1.5 Solves problems in context including contexts that be used to build awareness of other Learning Areas , as well as human rights , social, economic, and environmental issues such as : . financial (including profit and loss , budgets, accounts , loans , simple interest, hire purchase, exchange rates); NS LO 1 AS : Conducts investigations and collects data : Organises and uses equipment or sources to gather	Selection and use of appropriate methods to collect data. Designing and Using questionnaires to collect data, record using tables and stem-and –leaf displays Samples and populations	Worksheets Newspapers Magazines Questionnaires	FORM Assignment Test Classworks METHOD Teacher, Group, Self and Peer Assessment TOOLS Memorandum Rubric Checklist Recording sheets	

	populations , and suggests appropriate samples for investigation (including random samples) 7.5.5 Organises (including where appropriate) and records data using tallies, tables and stem-and- leaf displays. 7.5.6 Summarises ungrouped numerical data by determining mean, median and mode as measures of central tendency and distinguishes between them.	and record information				
Term 2 1st-2nd week	Cluster 2: LO 1 7.1.5 Solves problems in contexts including contexts that be used to build awareness of other learning Areas, as well as human rights, social, economic, and environmental issues such as final (including profit and loss, budget account, loans, simple interest, hire purchase, exchange rates); Measurements in Natural Sciences and Technology contexts. 7.1.6 Solves problems that involve ratio and	MATHS 7.4.3 Solves problems using a range of strategies including : . estimating ; . calculating to at least 2 decimal places ; . using and converting between appropriate S.I. units. including metric and other formal measuring systems. EMS LO 3 AS :	Problem solving Including profit and loss, budgets, accounts, loans, simple interest, hire purchase and exchange rates.	Calculators Flyers Bank brochures Calculators Workbooks Newspapers	FORM Daily exercises Assignments Tests METHOD Group Assessment Peer Assessment Self assessment Teacher assessment TOOLS Memorandum Rubric Checklist Observation sheets Recording	Questions and answers Cooperative group work Discussions

	rate.	Draws up an elementary statement of net worth, using personal records .			sheets	
3rd -4th week	Cluster 2: LO 2 7.2.3 Represents and uses relationships between variables in order to determine input /or output values in a variety of ways using: • Verbal descriptions • Flow diagrams • Tables 7.2.4 Constructs mathematical models that represent, describe and provide solutions to problem situations, showing responsibility towards the environment and the health of others (including problems within human rights, social, economic, cultural and environmental contexts). 7.2.5 Solves or complete number sentences by inspection or by trial and improvement, checking the solutions by substitution (e.g. 2 x □ - 8 = 4)	MATHS 7.1.9 Uses a range of techniques to perform calculations including : *Using commutative, associative and distributive properties with positive rational numbers and zero. TECH LO 1 AS: Chooses possible solutions ,gives sensible reasons for choice , and develops the chosen idea using graphics or modelling techniques .	Constructions of mathematical models that represent, describes and provide solutions to problem situations. Problem solving by inspection or trial and improvement.	Magazines Strings Paper strips Mathematical instruments set	FORM Classswork Assignments/ investigations Tests METHOD Group, Peer, Self and Teacher assessment TOOLS Memorandum Rubric Checklist Observation sheets Recording sheets	Questions and answers Cooperative group work Discussions Problem posing

5th -6th week	CLUSTER 2: LO 3 7.3.5 Uses transformations (rotations, reflections and translations) and symmetry to investigate (alone and /or as a member of a group or team) properties of geometric figures . 7.3.6 Recognises and describes the properties of similar and congruent figures and the difference between them.	MATHS 7.1.1 Counts backwards and forwards in the following ways: .In decimal intervals .in integers for any intervals 7.4.1 Solves problems involving distance	Transformation (rotation, reflection, and translation) and symmetry to investigate properties of geometric figures. Recognition and description of congruency and similarities in real life context.	Maths set Grid paper Mirror Real objects Graph paper Mathematical instrument set Pins	FORMS Daily tasks Assignment Tests exams METHOD Peer, Self, Teacher and Group assessment TOOLS Memorandum Rubric Checklist	Discussions Question and answer Cooperative groups Brainstorming
7th -9th week	Cluster 2:LO 4 7.4.5 Calculates, by selecting and using appropriate formulae: • Perimeter of polygons; • Area of triangles, rectangles and squares; • Volume of triangular and rectangular based prisms. 7.4.6 Describes interrelationships between perimeter and area of geometric figures.	MATHS 7.3.2 In contexts that include those that may be used to build awareness of social, cultural and environmental issues , describes and classifies geometric figures in terms of properties including :* sides and angles of polygons (with focus on , but not limited to, triangles and quadrilaterals) ; 7. . parallel and perpendicular sides.	Calculations using appropriate formulae in polygons, triangles and quadrilaterals. Description of	2-D shapes 3 D objects Ruler Tape measure Metre stick Dotted paper	FORMS Classworks Assignment Tests exams METHOD Peer, Self, Teacher and Group assessment TOOLS Memorandum Rubric Checklist	Discussions Question and answer Cooperative groups Brainstorming

	7.4.7 Describes interrelationships between surface area and volume of geometric solids.	TECH LO 1 AS : Chooses and uses appropriate tools and materials to make products by measuring, marking, cutting o r separating shaping or forming, joining or combining and finishing different materials with some accuracy	interrelationship between surface area and volume.			
10th -11th week	CLUSTER 2: LO 5 7.5.7 Identifies the largest and smallest scores in a data set and determines the difference between them in order to determine the spread of data (range). 7.5.8 Draws a variety of graphs by hand/ Technology to display and interpret data (grouped and ungrouped) including : • Bar graphs and double bar graphs • Histograms with given intervals • Pie charts • Line and broken line graphs 7.5.9 Critically reads and interprets data presented in a variety of ways to draw conclusions and make predictions sensitive to	MATHS 7.1.3 Recognises , classifies and represents the following numbers in order to describe and compare them: . integers .decimals (to at least three decimal places), fractions and percentages NS LO 1 AS : Conducts investigations and collects data : Organises and uses equipment or sources to gather and record information Maths 7.1.1 Counts backwards and forwards in the following ways:	Determination and identification of central tendency viz.: Median, mode median, range and mean. Drawing of graphs viz.: bar graphs histograms pie charts	Worksheets Calculators Graph papers Maths set Charts Calculators Crayons	FORMS Daily assessment tasks Assignment Tests Exams METHOD Peer, Self, Teacher and Group assessment TOOLS Memorandum Rubric Checklist FORMS Daily assessment tasks Assignment	Question and answer Cooperative groups Brainstorming Discussions Pair work Cooperative group work Discussions Brainstorming

	the role of : • Context (e.g. rural or urban, national or provincial); • Categories within the data (e.g. age, gender, race); • Scales used in graphs as a source of error and bias; • Choice of summary statistics (mean, median or mode); • Any other human rights and inclusivity issues.	.In decimal intervals .in integers for any intervals NS LO 1 AS : Evaluates data and communicates findings : Generalises in terms of a relevant aspect and describes how the data supports the generalisation	line and broken line graphs Critical reading and interpretation of data to draw conclusions and make predictions.		Tests METHOD Peer, Self, Teacher and Group assessment TOOLS Memorandum Rubric Checklist	
Term 3 1st- 4th week	Cluster 4:LO 1 7.1.7 Estimates and calculates by selecting and using operations appropriate to solving problems that involve: • Rounding off numbers to at least one decimal place; • Multiple operations with integers • Addition, subtraction and multiplication of common fractions; • Addition, subtraction	Life Orientation LO 3 AS : Demonstrates and reflects on decision – making skills LO 3 AS : Critically evaluates own study skill strategies	Addition , subtraction and multiplication of decimal fractions, division of positive decimals, percentages and exponents.		Memorandum Rubric Checklist	

	and multiplication of positive decimals to at least 2 decimal places; • Division of positive decimals with at least 3 decimal places by whole numbers; • Finding percentages; • Exponents 7.1.8 Performs mental calculations involving squares of natural numbers to at least 10^2 and cubes of natural numbers to at least 5^3. 7.1.10 Uses a range of strategies to check solutions and judges the reasonableness of solutions.		Mental calculations involving squares to at least 10^2 and cubes to at least 5^3 Calculations using a range of techniques			
5^{th-} 6^{th} week	<u>Cluster 3: LO 2</u> 7.2.7 Determines, analyses and interprets the equivalence of different descriptions of the same relationship or rule presented: • Verbally • In flow	<u>Life Orientation</u> LO 3 AS : Critically evaluates own study skill strategies	Determination and representation of input and output values: verbally, in flow diagrams and tables in order to formulate rules.	Worksheets Wall charts Various texts	<u>FORMS</u> Daily assessment tasks Assignment Tests Exams <u>METHOD</u> Peer, Self,	Cooperative group work Discussions Brainstorming

	diagrams • In tables • By equations or expressions In order to select the most useful representation for a given situation				Teacher and Group assessment TOOLS Memorandum Rubric Checklist	
7th week	CLUSTER 3: LO 3 7.3.7 Draws and interprets sketches of solids from different perspectives 7.3.8 Locates positions on co-ordinate systems (ordered grids) and maps using: • Horizontal and vertical change • Compass directions.	Maths 7.4.7 Describes interrelationships between surface area and volume of geometric solids. TECH LO 1 AS : Chooses and uses appropriate tools and materials to make products by measuring, marking, cutting o r separating shaping or forming, joining or combining and finishing different materials with some accuracy	Drawing and interpretation of sketches of solids in different perspective. Location of positions on co-ordinate systems and maps using compass directions	Crayons A 4 papers Maths set Grid papers Graph papers	FORMS Daily assessment tasks Assignment Tests Exams METHOD Peer, Self, Teacher and Group assessment TOOLS Memorandum Rubric Checklist	Cooperative group work Discussions Brainstorming
8th - 9th week	Cluster 3:LO 4 7.4.5 Calculates, by selecting and using appropriate formulae: • Perimeter of polygons; • Area of triangles, rectangles and squares; • Volume of	MATHS 7.3.2 In contexts that include those that may be used to build awareness of social, cultural and environmental issues , describes and classifies geometric figures in terms of properties including :*	Calculations using appropriate formulae in polygons, triangles and quadrilaterals.	2-D shapes 3 D objects Ruler Tape measure Metre stick Dotted paper	FORMS Classworks Assignment Tests exams METHOD Peer, Self, Teacher and Group assessment	Discussions Question and answer Cooperative groups Brainstorming

	triangular and rectangular based prisms. 7.4.6 Describes interrelationships between perimeter and area of geometric figures. 7.4.7 Describes interrelationships between surface area and volume of geometric solids.	sides and angles of polygons (with focus on , but not limited to, triangles and quadrilaterals) ; 8. . parallel and perpendicular sides. TECH LO 1 AS : Chooses and uses appropriate tools and materials to make products by measuring, marking, cutting o r separating shaping or forming, joining or combining and finishing different materials with some accuracy	Description of interrelationship between surface area and volume.		TOOLS Memorandum Rubric Checklist	
10th week	CLUSTER 3: LO 5 7.5.7 Identifies the largest and smallest scores in a data set and determines the difference between them in order to determine the spread of data (range). 7.5.8 Draws a variety of graphs by hand/ Technology to display and interpret data (grouped and ungrouped) including : • Bar graphs and double bar graphs • Histograms with given intervals	MATHS 7.1.3 Recognises , classifies and represents the following numbers in order to describe and compare them: . integers .decimals (to at least three decimal places), fractions and percentages NS LO 1 AS : Conducts investigations and collects data :	Determination and identification of central tendency viz.: Median, mode median, range and mean.	Worksheets Calculators	FORMS Daily assessment tasks Assignment Tests Exams METHOD Peer, Self, Teacher and Group assessment TOOLS Memorandum Rubric Checklist	Question and answer Cooperative groups Brainstorming Discussions

	• Pie charts • Line and broken line graphs 7.5.9 Critically reads and interprets data presented in a variety of ways to draw conclusions and make predictions sensitive to the role of : • Context (e.g. rural or urban, national or provincial); • Categories within the data (e.g. age, gender, race); • Scales used in graphs as a source of error and bias; • Choice of summary statistics (mean, median or mode); • Any other human rights and inclusivity issues.	Organises and uses equipment or sources to gather and record information <u>Maths</u> 7.1.1 Counts backwards and forwards in the following ways: .In decimal intervals .in integers for any intervals <u>NS</u> LO 1 AS : Evaluates data and communicates findings : Generalises in terms of a relevant aspect and describes how the data supports the generalisation	Drawing of graphs viz.: bar graphs histograms pie charts line and broken line graphs Critical reading and interpretation of data to draw conclusions and make predictions.	Graph papers Maths set Charts Calculators Crayons	<u>FORMS</u> Daily assessment tasks Assignment Tests <u>METHOD</u> Peer, Self, Teacher and Group assessment <u>TOOLS</u> Memorandum Rubric Checklist	Pair work Cooperative group work Discussions Brainstorming
Term 4 1st – 3rd week	<u>Cluster 5: LO 1</u> 7.1.9 Uses a range of techniques to perform calculations including : • using the commutative , associative and distributive properties with positive rational	<u>WITHIN</u> LO2- Patterns, Functions and Algebra. 7.2.2- Describes, explains and justifies observed relationships or rules in own words.	Calculations using a range of techniques. Recognition,	Fraction diagrams & walls Calculators Rulers Maths set Wall charts. Number line strips	<u>FORM</u> Daily activities Investigations Tests Assignments <u>METHOD</u> Group assessment Peer assessment Self assessment	Cooperative Groups Hot Potato Discussions Zopp Cards

	numbers and zero; • Using a calculator. 7.1.11.Recognises , describes and uses : • .algorithms for finding equivalent fractions ; • .the commutative , associative and distributive properties with rational numbers and zero	<u>ACROSS</u>: FAL LO2- Speaking. 7.2.3- Shows developing ability to use features of spoken language to communicate: word stress, weak vowels, intonation and rhythm.	description and use of: equivalent fractions commutative associative distributive properties		Teacher assessment <u>TOOLS</u> Checklist Rubric Rating Scale Observation Sheets Memorandum	
4^{th} – 6^{th} week	<u>CLUSTER 4: LO 2</u> 7.2.6 Describes the situation by interpreting a graph of the situation, or draws a graph from a description of a situation, (e.g. height of a roller –coaster car over time ; the speed of a racing car going around a track.	Maths 7.5.8 Draws a variety of graphs by hand/ Technology to display and interpret data (grouped and ungrouped) including : *bar graphs and double bar graphs ; * histograms with given intervals * pie charts * line and broken line graphs <u>NS</u> LO 1 AS : Evaluates data and communicates findings : Generalises	Description of a situation by interpreting graphs Drawing of graphs	Graph paper Maths set	<u>FORMS</u> Daily assessment tasks Assignment Tests METHOD Peer assessment Self assessment Teacher assessment Group assessment <u>TOOLS</u> Memorandum Rubric	Question and answer Cooperative groups Brainstorming Discussions

		in terms of a relevant aspect and describes how the data supports the generalisation			Checklist	
7th - 10th week	CLUSTER 4: LO 3 7.3.7 Draws and interprets sketches of solids from different perspectives 7.3.8 Locates positions on co-ordinate systems (ordered grids) and maps using: • Horizontal and vertical change • Compass directions.	Maths 7.4.7 Describes interrelationships between surface area and volume of geometric solids. TECH LO 1 AS : Chooses and uses appropriate tools and materials to make products by measuring, marking, cutting o r separating shaping or forming, joining or combining and finishing different materials with some accuracy	Drawing and interpretation of sketches of solids in different perspective. Location of positions on co-ordinate systems and maps using compass directions	Crayons A 4 papers Maths set Grid papers Graph papers	FORMS Daily assessment tasks Assignment Tests Exams METHOD Peer, Self, Teacher and Group assessment TOOLS Memorandum Rubric Checklist	Cooperative group work Discussions Brainstorming
11thweek	CLUSTER 4: LO 4 7.4.8 Classifies angles into acute, right, obtuse, straight, reflex or revolution 7.4.9 Estimates, compares, measures and draws angles accurate to one degree using protractors.	Maths 7.1.1 Counts backwards and forwards in the following ways: .In decimal intervals .in integers for any intervals TECH LO 1 AS : Chooses and uses appropriate tools and materials to make products by measuring, marking, cutting o r separating shaping or forming, joining or	Classification, estimation and drawing of different angles.	Mathematical instrument set Watch Wall charts	FORMS Daily assessment tasks Assignment Tests METHOD Peer, Self, Teacher and Group assessment TOOLS Memorandum	Cooperative Groups Hot Potato Discussions Zopp Card

		combining and finishing different materials with some accuracy			Rubric Checklist	
	<u>Cluster 4: LO 5</u> 7.5.10 Performs simple experiments where the possible outcomes are equally likely and : • Lists the possible outcomes based on the conditions of the activity : • Determines the frequency of actual outcomes for a series of trials; Determines the relative frequency using the definition of relative frequency (see Mathematics Learning Area Glossary)	NS LO 1 AS: Evaluates data and communicates findings: Generalises in terms of a relevant aspect and describes how the data supports the generalisation.	Theory of probability -listing possible outcomes and determine relative frequency	Cards Dice Worksheets Coins	<u>FORMS</u> Daily assessment tasks Assignment Tests <u>METHOD</u> Peer, Self, Teacher and Group assessment <u>TOOLS</u> Memorandum Rubric Checklist	Cooperative Groups Hot Potato Discussions Zopp Card

GRADE 8 WORKSCHEDULE

TERM	LO and ASs	INTEGRATION	CONTENT IN CONTEXT	RESOURCES	ASSESSMENT FORMS, METHODS and TOOLS	TEACHING AND LEARNING STRATEGIES
1. WEEK 1-4	LO1 Number, operations and relationships. <u>CLUSTER 1 (LO1)</u> 8.1.1 Describes and illustrates the historical development of numbers (e.g. irrational numbers) 8.1.2 Recognises, classifies and represents the following numbers in order to describe and compare them: • Integers • Decimals, fractions and percentages • Numbers written in exponential form including squares and cubes of natural numbers and their square and cube roots; • Large numbers in scientific notation; • Additive and multiplicative inverses; • Multiples and factors; • Irrational numbers in the context of measurement	Within: MATHEMATICS LO 4 Measurement 8.4.3 Solves problems using a range of strategies including: • Estimating • Calculating to at least 2 decimal places. • Using and converting between appropriate S.I units. 8.4.4 Describes the meaning of and uses pi in calculations involving circles and discusses its historical development in	Rational Numbers Measurement S.I units Conversions Exponents	Number-lines Magazines Number grids News papers Measuring instruments.	Forms of Ass: Class work Tests Homework Method Teacher Group Self Tools Memorandum Rubric	Rainbow Groups Discussions Brainstorming Cooperative Groupwork Individual work

	(e.g. π and square and cube roots of non-perfect squares and cubes. 8.1.3 Recognises and uses equivalent forms of the rational numbers listed above. CLUSTER 4 (LO1) 8.1.7 Uses a range of techniques to perform calculations including : • Using commutative , associative and distributive properties with rational numbers ; • using a calculator. 8.1.9 Recognises, describes and uses: • Algorithms for finding equivalent fractions; • Commutative, associative, distributive properties with rational numbers (the expectations is that learners will be able to use these properties and not necessarily to know the names of properties).	measurement. Within: Mathematics 8.4.3 Solves problems using a range of strategies including : • Estimating; • calculating to at least 2 decimal places ; • using and converting between appropriate S.I.units.	Calulations including commutative, associative and distributive properties of rational numbers.	Text books Calculators Fraction strips Fraction circles Paper for A 4 folding	Forms of Ass: Class work Tests Homework Method Teacher Group Self Tools Memorandum Rubric	Work in pairs Individually Gallery walk Investigative approach I
WEEK 5-8	CLUSTER 3 (LO1) 8.1.6 Estimates and calculates by selecting and using operations appropriate to solving problems that involve: • Rounding off • Multiple operations	Within: Mathematics LO 4: Measurement 8.4.3 Solves problems using a range of strategies including:	Multiple operations involved in solving problems with rational numbers.	Text books Calculators	Forms of Ass: Class work Tests Homework Method Teacher Group	ndividual/group work Brainstorming Discussions

	with rational numbers (including division with fraction and decimals) • exponents	• Estimating; • Calculating to at least 2 decimal places; • Using and converting between appropriate S.I units. 8.4.6 Converts between: • (			Self Tools Memorandum Rubric	
WEEK 9-11	<u>CLUSTER 1 (LO2)</u> LO 2 Patterns, functions and algebra. 8.2.1 Investigates and extends numeric and geometric patterns looking for relationship or rules, including patterns: • represented in physical and diagrammatic form. • Not limited to sequences involving constant difference or ratio. • Found in natural and cultural contexts. • Of the learner's own creation. • Represented in tables. • Represented algebraically. 8.2.2 Describes, explains and justifies observed relationships or rules in	Within: Mathematics LO3: Space and Shape 8.3.9 Locates position on co-ordinate systems (ordered grids), Cartesian plane (first quadrant) and maps, and describes how to move between positions using: • Horizontal and vertical change; • Ordered pairs;	Investigation of numeric and geometric patterns.	Graph papers Text books Examples from garments and other relevant sources. Charts	Forms: Investigation Class work Test Homework Method Teacher Group Peer Tools Memorandum Checklist rubric	Investigations Verbal presentations Discussions Brainstorming Individual / groupwork

	own words or in algebra. CLUSTER 2 (LO2) 8.2.3 Represents and uses relationships between variables in order to determine input and/or output values in a variety of ways using: • Verbal descriptions • Flow diagrams • Tables • Formulae and equations	• Compass directions NS LO 2 8.2.3 Interprets information by translating tabulated data into graphs, by reading data off graphs, by <u>making predictions from patterns</u> Within: Mathematics LO 5 Data handling. 8.5.8 Draws a variety of graphs by hand/technology to display and interpret data including: • Bar graphs and double bar graphs • Histograms with given and own intervals; • Pie charts • Line and broken-line graphs; • Scatter plots NS LO 2 8.2.3 Interprets information by	Relationship between the dependent and independent variables. Problem-solving involving equations. Graphical representation of a problem situation. Interpretation of graphs.	Graph paper Calculator Text book	Forms of Ass: Class work Tests Homework Poster predsentations Method Teacher Group Self Tools Memorandum Rubric	Co-operative work Verbal presentations Discussions Investigative approach

	CLUSTER 1 (LO3) LO 3 Space and shape 8.3.1 Recognises, visualises and names geometric figures and solids in natural and cultural forms and geometric settings, including: • Those previously dealt with. • The platonic solids (tetrahedron, cube, octahedron, dodecahedron, icosahedrons). 8.3.4 Uses a pair of compasses, ruler and protractor to accurately construct geometric figures for investigation of own property and design of nets. 8.3.5 Design and uses nets to make a model of geometric solids studied up to and including this grade.	translating tabulated data into graphs, by reading data off graphs, by making predictions from patterns Within: Mathematics LO 4 Measurement 8.4.7 Estimates, compares, measures and draws angles accurate to one degree using protractors. Across: Technology LO 1: Technological processes and skills 8.1.9 Develops a plan for making that outlines all the following: • Sketches showing the necessary dimensions or quantities.	Geometric shapes in natural and cultural forms. Regular and irregular polygons and polyhedron, together with their properties, as well as models of solids.	Examples of 2D and 3D objects Mathematical instruments	Forms: Class work Homework Investigation Test Assignment poster Method Teacher Group Peer Tools Memorandum Rubric	Verbal presentations Individual Work in pairs Poster presentations Gallery walk

	8.3.2 In contexts that include those that may build awareness of social, cultural and environmental issues, describes and classifies geometric figures and solids in terms of properties, including: Sides, angles and diagonals and their interrelationships with focus on triangles and quadrilaterals (e.g. types of triangles and quadrilaterals).					

2 WEEK 1-2	<u>CLUSTER 1 (LO5)</u> LO5: Data Handling 8.5.1 Poses questions relating to human rights, social, economic, environmental and political issues in own environment. 8.5.2 Selects, appropriate sources of data (including peers, family, news papers, books, magazines, the internet). 8.5.3 Designs and uses questionnaires	Across 1st Additional Language LO 5: Thinking and reasoning. 8.5.3 Collects and records information in different ways: • Transfers information from one	Methods of collecting information.	Books Magazines Internet Human resource Data generators e.g. dice, spinners.	Forms of Ass: Class work Tests Homework Assignment Investigation Project Method Teacher Group/ peer Tools Memorandum	Poses questions. Designing a questionnaire as well as interview questions Research Verbal presentations

	with a variety of possible responses in order to collect data (alone and/or as a member of a group or team) to answer questions. 8.5.4 Performs simple experiments using random number generators, coins, spinners, dice and cards in order to collect data. 8.5.5 Organises (including grouping where appropriate) and records data using tallies, tables and stem-and-leave displays.	mode to another by, for example, using mind maps.			Rubric Tools Memorandum	
	CLUSTER 2 (LO5) 8.5.6 Summarizes grouped and ungrouped numerical data by determining mean, median and mode as measures of central tendency and distinguishes between them. 8.5.7 Determines measures of dispersion, including range and extremes.	Across: NS LO1 8.2.3 Interprets information by translating tabulated data into graphs, by reading data off graphs, and by making predictions from patterns	Measures of central tendency: Mean, median and mode. Measures of dispersion: Range and extremes.	Calculator Text book	Forms of Ass: Class work Tests Homework Assignment Investigation Project Method Teacher Group/ peer Tools Memorandum Rubric Tools Memorandum	Group work Verbal presentations

WEEK 3-6	<u>CLUSTER 5 (LO2)</u> LO2: Patterns, Functions and Algebra. 8.2.9 Interprets and uses the following basic algebraic vocabulary in context: term, expression, coefficient, exponent (index), base, constant, variable, equation, formula (or rule). 8.2.8 Uses conventions of algebraic notation and the commutative, associative and distributive laws to: • Classify terms as like and unlike, and to justify the classification. • Collect like terms. • Multiply or divide an algebraic expression with one, two or three terms by a monomial. • Simplify algebraic expressions given in bracket notation, involving one or two sets of brackets and two kinds of operations. • Compare different representations of algebraic expressions involving one or more operations, selecting those which are equivalent and justifying	Within: Mathematics LO 1: Numbers, operations and relationships. 8.1.7 Uses arrange of techniques to perform calculations including: • Using the commutative, associative and distributive properties with rational numbers. • Using a calculator.	Uses conventions of algebraic notation. Commutative, associative and distributive laws. Algebraic terminology.	Books Magazines Internet Newspapers	Forms of Ass: Class work Tests Homework Assignment Investigation Method Teacher Group/ peer Tools Memorandum	Investigative approach Verbal presentations Discussions Individual work initially. Discussions

	own choice. • Write algebraic expressions, formulae or equations in simpler or more useful equivalent forms in context. CLUSTER 2 8.2.5 Solves equations by inspection, trial-and-improvement or algebraic processes (additive and multiplicative inverses), checking the solution by substitution.	Within: Mathematics LO 5 Data handling. 8.5.8 Draws a variety of graphs by hand/technology to display and interpret data including: • Bar graphs and double bar graphs • Histograms with given and own intervals; • Pie charts • Line and broken-line graphs; • Scatter plots	Problem-solving involving equations. Graphical representation of a problem situation. Interpretation of graphs.	Text books Calculators	Forms of Ass: Class work Tests Homework Assignment Investigation Method Teacher Group/ peer Tools Memorandum	Investigations Problem solving
WEEK 7 - 11	<u>CLUSTER 4 (LO3)</u> LO 3 Space and Shape 8.3.3 Uses vocabulary to describe parallel lines cut by a transversal, perpendicular lines, intersecting lines and triangles in terms of	Within: Mathematics LO 4: Measurement 8.4.2 Solves problems involving: • Length	Investigation of the properties of parallel lines/non-parallel lines	Mathematical instruments. Mathematics kits. Books Internet	Forms of Ass: Class work Tests Homework Investigation Examination	Verbal presentations

	angle relationship. (e.g. vertically opposite, corresponding, co-interior, alternate angles) LO 4 Measurement 8.4.7 Estimates, compares, measures and draws angles accurate to one degree using protractors.	• Perimeter • Area/ surface area • Volume of rectangular prisms and cylinders.	and associated angles (alternate, co-interior, corresponding angles) using measurement initially. Designing of geometric solids using nets.		Method Teacher Group/ peer Tools Memorandum Rubric	
3 WEEK 1-3	<u>CLUSTER 2 (LO2)</u> LO 2 Patterns, functions and algebra. 8.2.4 Constructs mathematical models that represent, describe and provide solutions to problem situations, showing responsibility to the environment and the health of others (including problems within human rights, social, economic, cultural and environmental contexts). CLUSTER 3 (LO2)	Within: Mathematics LO 5 Data handling. 8.5.8 Draws a variety of graphs by hand/technology to display and interpret data including: • Bar graphs and double bar graphs • Histograms with given and own intervals; • Pie charts • Line and broken-line graphs; • Scatter plots Within: Mathematics	Problem-solving involving equations. Graphical representation of a problem situation. Interpretation of graphs. Interpretation	Text book Newspapers Magazines Graph paper Graph paper	Forms of Ass: Class work Tests Homework Project Assignment Investigation Method Teacher Group/ peer Tools Memorandum Rubric Forms of Ass:	Group work Include problems that highlights issues within human rights, social, economic, cultural and environmental contexts). Individual work/Group work

	8.2.6 Describes a situation by interpreting a graph of the situation, or draws a graph from a description of a situation, with special focus on trends and features such as: • Linear or non-linear • Increasing or decreasing • Maximum/minimum • Discrete or continuous.	LO 5 Data handling. 8.5.8 Draws a variety of graphs by hand/technology to display and interpret data including: • Bar graphs and double bar graphs • Histograms with given and own intervals; • Pie charts • Line and broken-line graphs; • Scatter plot	of graphs	Text books Claculators	Class work Tests Homework Project Assignment Investigation Method Teacher Group/ peer Tools Memorandum Rubric	This content lends itself to investigations and projects as well as equations.
WEEK 4-6	<u>CLUSTER 4 (LO2)</u> 8.2.7 Determines, analyses and interprets the equivalence of different descriptions of the same relationship or rule presented: • Verbally • In flow diagrams • In tables • By equations or expressions in order to select the most useful representation for the given situation.	Within: Mathematics LO 4 Measurement 8.4.1 Solves more complex problems involving time, including relating time distance and speed. Across EMS LO 1 8.1.1 Describes the	Problem solving involving finances, ratio and rate and measurement.	Text book Newspapers Magazines Banking statements and slips.	Forms of Ass: Class work Tests Homework Project Assignment Investigation Method Teacher Group/ peer Tools Memorandum Rubric	Problem posing Verbal presentations Discussions

		historical development of money and its role in societies and their economies. EMS LO 3 8.3.6 Investigates the various methods of savings and investments (e.g. savings accounts, fixed deposits, shares, unit trusts), and calculates the returns on a variety of investments.				
WEEK 7-9	<u>CLUSTER 2 (LO1)</u> LO 1: Numbers, operations and relationships. 8.1.4 Solves problems in context including context that may be used to build awareness of other Learning Areas, as well as human rights, social, economic and environmental issues such as: • Financial (including profit and loss, budget, accounts, loans, simple and, hire purchase, exchange rates. • Measurements in Natural Sciences and Technology contexts.	Within: Mathematics LO 4 Measurement 8.4.1 Solves more complex problems involving time, including relating time distance and speed. Across EMS LO 1 8.1.1 Describes the historical development of money and its role in societies and	Problem solving involving finances, ratio and rate and measurement. . Problem-solving involving measurement of geometric figures (perimeter, area and volumes). Conversions between S.I. units.	Text books Calculators	Forms of Ass: Class work Tests Homework Project Assignment Investigation Method Teacher Group/ peer Tools Memorandum Rubric	Group work/Individual work Problem solving Reseach

	8.1.5 Solves problems that involve ratio and rate.	their economies.		Mathematical Instruments Calculators Text books	Forms of Ass: Class work Tests Homework Assignment Method Teacher Group/ peer Tools Memorandum Rubric	Brainstorming, co-operative learning.
	CLUSTER 2 (LO 4) LO 4: Measurement 8.4.1 Solves more complex problems involving time, including relating time distance and speed. CLUSTER 3 (LO1) 8.1.8 Uses a range of strategies to check solutions and judge the reasonableness of solutions. CLUSTER 2 (LO4) LO4: Measurement 8.4.3 Solves problems using a range of strategies including:	Within: Mathematics LO 1 Numbers, operations and relationships. 8.1.6 Estimates and calculates by selecting and using operations appropriate to solving problems that involve: • Rounding off; • Multiple operations with rational numbers (including	Problem-solving involving time; Distance and speed;	Text books News Papers Magazines Calculators Stop watch	Forms of Ass: Class work Tests Homework Assignment Method Teacher Group/ peer Tools Memorandum Rubric	Problem posing Group work and individual work

	• Estimating; • Calculating to at least 2 decimal places; • Using and converting between appropriate S.I units. 8.4.6 Converts between: • ( CLUSTER 1 (LO4) 8.4.4 Describes the meaning of and uses π in calculations involving circles and discusses its historical development in measurement. 8.4.2 Solves problems involving: • Length • Perimeter and area polygons and circles; • Volume and surface area of rectangular prisms and cylinders. 8.4.5 Calculates, by selecting and using appropriate formulae: • Perimeter of polygons and circles; • Area of triangles, rectangles, circles and polygons by decomposition into triangles and rectangular-based prisms and cylinders.	division with fractions and decimals); • Exponents Within: Mathematics LO 3 Space and shape 8.3.2 In contexts that may be used to build awareness of social, cultural and environmental issues, describes and classifies geometric figures and solids in terms of properties, including: • Sides, angles and diagonals and their interrelationships, with focus on triangles and quadrilaterals (e.g. types of triangles and quadrilaterals).	Measurement of geometric figures (perimeter, area, total surface area and volumes). Conversions between S.I. units Use and meaning of pi and its historical development in measurement	Measuring instruments Calculator Text books	Forms of Ass: Class work Tests Homework Assignment Method Teacher Group/ peer Tools Memorandum Rubric	Group work

WEEK 10-11	CLUSTER 2 (LO5) LO 5 Data handling 8.5.8 Draws a variety of graphs by hand/technology to display and interpret data including: • Bar graphs and double bar graphs • Histograms with given and own intervals; • Pie charts • Line and broken-line graphs; • Scatter plots 8.5.9 Critically reads and interprets data presented in a variety of ways in order to draw conclusions and make predictions sensitive to the role of : • Context (e.g. rural or urban, national or provincial); • Categories within the data (e.g. age, gender, race); • Data manipulation (e.g. grouping, scale, choice of summary statistics) for different purposes; • The role of outliers on data distribution; • Any other human rights and inclusive issues.	Within: Mathematics LO 2 Patterns, functions and algebra. 8.2.6 Describes a situation by interpreting a graph of the situation, or draws a graph from a description of a situation, with special focus on trends and features such as: • Linear or non-linear • Increasing or decreasing • Maximum/minimum • Discrete or continuous.	Reading and interpretation of graphs.	Graph paper Text books Magazines News papers Mathematical instruments	Forms: Class work Tests Homework Assignment Investigation Project Method Teacher Self Tools Memorandum	Individual work/group work.
4. WEEK 1 – 2	CLUSTER 3 (LO4) LO 4: Measurement 8.4.10	Within: Mathematics LO 3 Space and	Problem-solving using the theorem of	Mathematical instruments Text books	Forms: Class work Tests	Group discussions, Investigations Verbal presentations

	Describes and illustrates ways of measuring in different cultures throughout history (e.g. determining the right- angles using knotted string, leading to the Theorem of Pythagoras. 8.4.8 Investigates (alone or as a member of a group or team) the relationship between the sides of a right-angled triangle in order to develop the Theorem of Pythagoras. 8.4.9 Uses the Theorem of Pythagoras to calculate a missing length in a right-angled triangle leaving irrational answers in surd form (√)	shape 8.3.2 In contexts that may be used to build awareness of social, cultural and environmental issues, describes and classifies geometric figures and solids in terms of properties, including: Sides, angles and diagonals and their interrelationships, with focus on triangles and quadrilaterals (e.g. types of triangles and quadrilaterals).	Pythagoras.	Magazines Graph paper/Square grid paper	Homework Investigations Method Teacher Self Tools Memorandum	Problem posing
WEEK 3-5	CLUSTER 3 (LO3) LO 3 Space and shape 8.3.9 Locates positions on co-ordinate systems (ordered grids). Cartesian plane (first quadrant) and maps, and describes how to move between positions using: • Horizontal and vertical change; • Ordered pairs; • Compass direction. 8.3.8 Draws and interprets sketches of geometric solids from different perspectives with attention to the preservation of properties.	Within: Mathematics LO 2 Patterns, functions and algebra. 8.2.6 Describes a situation by interpreting a graph of the situation, or draws a graph from a description of a situation, with special focus on trends and features such as: • Linear or non-linear • Increasing	Plotting of points on a Cartesian plane. Transformations (e.g. rotations, reflections and translations)	Graph paper Text books Mathematical instruments Mirrors Tracing paper	Forms: Class work Tests Homework Investigations Method Teacher Self Tools Memorandum	Work in pairs and individually Investigative approach

		or decreasing • Maximum/minimum • Discrete or continuous.				
WEEK 6	CLUSTER 2 (LO3) 8.3.6 Uses transformations (rotations, reflections and translations) and symmetry to investigate (alone and/or as a member of a group or team) properties of geometric figures. 8.3.7 Uses proportion to describe the effect of enlargement and reduction on properties of geometric figures.	Within: Mathematics LO 1 Numbers, operations and relationships. 8.1.5 Solves problems that involves ratio and rate.	Problem-solving involving time, distance and speed. Ratio and rate.	Mathematical instruments Stopwatch Trundle wheel/tape measure Text books	Forms: Class work Tests Homework Investigations Method Teacher Self Tools Memorandum	Group as well as individual work. Investigations Verbal presentations
WEEK 7-8	CLUSTER 3 (LO5) LO 5 Data handling 8.5.10 Considers a simple situation (with equally likely outcomes) that can be described using probability and: • Lists all the possible outcomes; • Determines the probability of each possible outcome using the definition of probability;	Within: Mathematics LO 1 Numbers, operations and relationships. 8.1.2 Recognises, classifies and represents the following numbers in order to describe and compare them; • Decimals, fractions and percentages	Probability	Dice Coins Spinners Playing cards Text books Lotto	Forms: Class work Tests Homework Investigations Method Teacher Self Tools Memorandum	Group discussions with respect to real-life situations in which probability occurs. Verbal presentations

	• Finds the relative frequency of actual outcomes for a series of trials; • Compares relative frequency with probability and explains possible differences; • Predicts with reason the relative frequency of possible outcomes for a series of trials based on probability.					

GRADE 9 WORKSCHEDULE

TERM	LOs and ASs	Integration	Content in Context	Resources	Assessment Strategies	Teaching and Learning Strategy
1 Week 1- 2	Cluster 1 LO1:Number Recognition 9.1.1 Describes and illustrates the historical development of number systems in a variety of historical and cultural contexts (including local). 9.1.2 Recognises, uses and represents rational numbers (including very small numbers written in scientific notation), moving flexible between equivalent forms in appropriate context. Cluster 4 (Properties of numbers) 9.1.7 Recognises, describes and uses the properties of rational numbers.	Within: LO2: Patterns, functions and Algebra. 9.2.8 Uses the laws of exponents to simplify expressions and solve equations.	Description and illustration of historical development of numbers. Recognition, uses and representation of rational numbers. Calculations using various techniques: including laws and meaning of exponents.	Number-lines Number grids	Forms of Ass: Class work Tests Homework Assignment Method Teacher Group Tools Memorandum Rubric	Brainstorming Problem posing Research
Week 3 – 4	LO2: Patterns, functions and algebra. Cluster 1 (PATTERNS) 9.2.1 Investigates, in different ways, a variety of numeric and geometric patterns and relationships by representing and generalizing them, and by explaining and justifying the rules that generate them(including patterns of the learner's own creation)	Within: LO3: Space and Shape 9.3.7 Uses various representational systems to describe position and movement betweenpositions, including: Ordered grids Cartesian plane Compass directions in	Investigation of Patterns and justification of rules. Identify patterns in the environment. Learners design their own patterns.	Graph papers Text books Examples from garments and other relevant sources. Charts	Forms: Investigation Class work Test Homework Method Teacher Group Peer Tools Memorandum Rubric Checklist	Group work. Problem posing Questions and answers.

		degrees Angles of elevation and depression Across: Arts & culture LO4: Expressing and communicating. Dance as a discipline 9.4.1 Explains how dance is shaped by and reflects the value of the times and is influenced by music, place, fashion and technology				
Week 5 -6	<u>Cluster 2</u> (EQUATIONS) 9.2.2 Represents and uses relationships between varieties in order to determine input and/or output values in a variety of ways using: Verbal description Flow diagram Tables Formulae and equations. 9.2.3 Construct Mathematical models that represent, describes and provide solutions to problem situation showing responsibility towards the environment and the health of others (including problems within human rights, social, economic, cultural and environmental context) 9.2.4 Solves equations by inspection, trial and improvement or algebraic process (additive and multiplicative	Within: LO4: Measurement 9.4.1 Solves ratio and rate problems involving time distance and speed. Social Sciences: Historical Interpretation AS: Constructs an interpretation based on sources giving reasons for own interpretation	Determination and representation of input and out-put values: verbally, in Flow diagrams, and in tables in order to formulate rules. Construction of mathematical Models that represent, describes and provide solutions to problem situations. Problem solving equations and multiplicative inverse, factorisation	Various texts Magazines, Internet News papers Graph papers Mathematical instruments set	Forms of Ass: Class works Tests Home works Assignments Method Teacher Group / peer Tools Memorandum rubric	Problem posing Brainstorming Question and answer

	inverses, and factorization), checking the solutions by substitution.					
Week 7	Cluster 3 (Graphs) 9.2.5 Draws graphs on the Cartesian Plane for given equations (in two variables), or determines equations or formulae from given graphs using tables where necessary.		Drawing of graphs and use of tables	Graph Papers Text books	Forms: Class work Homework Test Assignment Method Teacher Group Peer Tools Memorandum Rubric	Group work. Working in pairs Discussion
Week 8	Cluster 5 (EQUIVALENT REPRESENTATION 9.2.6 Determines, analyses and interprets the equivalence of different descriptions of the same relationship or rule presented: Verbally In flow diagrams In tables By equations or expressions By graphs on the Cartesian plane in order to select the most useful representation for a given situation.	Within LO1: Numbers Operations and relationships 9.1.6 Uses a range of techniques and (including technology) to perform calculations efficiently and to the required degree of accuracy, including the following laws and meanings of exponents (the expectation being that learners should be able to use these laws	Interprete relationships	Books Graph papers	Forms: Class work Homework Test Assignment Method Teacher Group Peer Tools Memorandum Rubric	Group work. Working in pairs Discussion

		and meanings in calculations only); • $x^n x x^m = x^{n+m}$ • $x^n \div x^m = x^{n-m}$ • $x^o = 1$ • $x^{-n} = 1/x^n$				
Week 9	Cluster 3 (Shapes and objects) LO3: Space and Shape 9.3.1 Recognizes, visualizes and names geometric figures and solids in natural and cultural forms and geometric settings, including: Regular and irregular polygons and polyhedra Spheres Cylinders 9.3.4 Draws and or construct geometric figures and make models of solids in order to investigate and compare their properties and model situation in the environment	Across: Technology LO 1: Technological processes and skills 9.1.1 Presents ideas (in a project portfolio) using formal drawing techniques, in two-dimensional and three-dimensional sketches, circuit diagrams or systems.	Recognition of geometric shapes in natural and cultural forms. Construction and drawing of geometric figures. Making of models to investigate their properties	Examples of 2Ds and 3D objects Mathematical instruments set	Forms of Ass: Class work Tests/Examination Homework Investigation Method Teacher Group/ peer Tools Memorandum Rubric	Questions and answers. Discussions. Investigations
Week 10	Cluster 2 (LO3) Transformations, congruency and similarity 9.3.2 In contexts that include those that may be used to build awareness of social, cultural and environmental issues, describes the interrelationships of the properties of geometric figures and solids with justification, including: • Congruence and straight line geometry; • Transformations.	Within: LO 4: Measurement 9.4.4 Uses the Theorem of Pythagoras to solve problems involving missing lengths in known geometric figures and solids. LO 2 Patterns,	Transformation Congruency, similarity Application of Pythagoras theorem	Dotted grid paper Graph paper Mathematical instrument	Forms of Ass: Class work Tests Homework Investigation Method Teacher Group/ peer Tools Memorandum Rubric	Questions and answers. Discussions Inverstigations

	9.3.5 Uses transformations, congruence and similarity to investigate, describe and justify (alone and/ or as a member of a group or team) properties of geometric figures and solids, including tests for similarity and congruence of triangles.	Functions and Algebra 9.2.5 Draws graphs on the Cartesian plane for given equations (in two variables), or determines equations or formulae from given graphs using tables where necessary	Problem solving using the geometry of straight lines and triangles.			
Week 11	LO5: Data Handling 9.5.1 Poses questions relating to human rights, social, economic, environmental and political issues in South Africa. 9.5.2 Selects, justifies and uses appropriate methods for collecting data (alone and/or as a member of a group or team) which include questionnaires and interviews, experiments, and sources such as books, magazines and the Internet in order to answer questions and thereby draw conclusions and make predictions about the environment. 9.5.3 Organizes numerical data in different ways in order to summarize by determining: • Measures of central tendency Measures of dispersion	Across 1st Additional Language LO 5: Thinking and reasoning. 9.5.3 Collects and records information in different ways: • Transfers information from one mode to another.	Selection and use of appropriate methods to collect data,	Books Magazines Internet Human resource Questionnaires	Forms of Ass: Class work Tests Homework Project Method Teacher Group/ peer Tools Memorandum Rubric	Discussions Research Problem posing Gallery walk
Term 2 Week 1- 2	Cluster 3 (LO1) Calculations 9.1.5 Estimates and calculates by selecting and using operations appropriate to solving problems and judging the		Calculations using various techniques; including laws and meaning of	Text books	Forms of Ass: Assignment Home work Class work Test	Group work Question and answers Discussions Problem posing

	reasonableness of results (including measurement problems that involve rational approximations of irrational numbers). 9.1.6 Uses a range of techniques and (including technology) to perform calculations efficiently and to the required degree of accuracy, including the following laws and meanings of exponents (the expectation being that learners should be able to use these laws and meanings in calculations only); • $x^n x x^m = x^{n+m}$ • $x^n \div x^m = x^{n-m}$ • $x^o = 1$ • $x^{-n} = 1/x^n$		exponents.		Method Teacher Self	
Week 3- 4	<u>Cluster 4 (LO2)</u> Algebraic Conventions 9.2.7 Uses the distributive law and manipulative skills developed in Grade 8 to : • Find the product of two binomials • Factorise algebraic expressions (limited to common factors and difference of squares) 9.2.8 Uses the laws of exponents to simplify expressions and solve equations. 9.2.9 Uses factorization to simplify algebraic expressions and solve equations	Within LO1: Numbers operations and relationships 9.1.6 Uses a range of techniques and (including technology) to perform calculations efficiently and to the required degree of accuracy, including the following laws and meanings of exponents (the expectation being that learners should be able to	Product of two binomials Factoring algebraic expressions Laws of exponents Solving equations Simplifying algebraic expressions and equations		Forms of Ass: Class work Home work Assignment Test Method Teacher Group Self / peer Tools Memorandum Rubric Observation sheet Check list	Cooperative Group work Question and answer Discussion

		use these laws and meanings in calculations only); • $x^n x x^m = x^{n+m}$ • $x^n \div x^m = x^{n-m}$ • $x^o = 1$ • $x^{-n} = 1/x^n$				
Week 5	Cluster 2 (LO3) Positions 9.3.6 Recognises and describes geometric solids in terms of perspective, including simple perspective drawing. 9.3.7 Uses a various representational systems to describe positions and movement between positions, including • Ordered grids • Cartesian Plane (4 Quadrant) • Compass directions in degrees • Angles of elevation and depression	Within LO2: Patterns Functions and algebra 9.2.5 Draws graphs on the Cartesian Plane for given equations (in two variable), or determines equation or formulae from given graphs using tables where necessary	Drawing solids in perspective Description and representation of position in a Cartesian plane	Isometric paper Mathematical set Graph paper	Forms of Ass: Class work Home work Assignment Test Method Teacher Group Self / peer Tools Memorandum Rubric Observation sheet Check list	Cooperative Group work Question and answer Discussion Problem posing Brain storming Individual Work
Week 6 -7	Cluster 2 (LO4) Solving Problems 9.4.2 Solves problems – including problems in context that may be used to develop awareness of human rights, social, economic, cultural and environmental issue- involving known geometric figures and solids in a range of measurement context by: • Measuring precisely and selecting measuring instruments appropriate to the problem • Estimating and calculating with precision;	Within LO1 Numbers operations and relationships 9.1.5 Estimates and calculates by selecting and using operations appropriate to solving problems and judging the reasonableness of results (including	Solving problems involving measurement Development of measuring instruments	Mathematical instruments Text books Measuring instruments	Forms of Ass: Class work Home work Assignment Test Project Method Teacher Group Self / peer Tools Memorandum	Cooperative Group work Discussion Problem posing Brain storming Individual Work

	• Selecting and using appropriate formulae and measurement 9.4.3 Describes and illustrate the development of measuring instruments and conventions in different cultures throughout history	measurement problems that involve rational approximations of irrational numbers).			Rubric	

TERM	LOs and ASs	Integration	Content in Context	Resources	Assessment Strategies	Teaching and Learning Strategy
Week 8- 10	Cluster 2 (LO5) Representing and Interpreting Data 9.5.4 Draws a variety of graphs by hand / technology to display and interpret data including: • Bar graphs and double bar graphs • Histograms with given and own intervals • Pie Charts • Line and broken –line graph • Scatter plots 9.5.5 Critically reads and interprets data with awareness of sources of error and manipulation to draw conclusions and make predictions about: • Social, environmental and political issues (e.g crime, national expenditure, conservation, HIV/ AIDS); • Characteristics of target groups (e.g age, gender, race, socio-economic groups) • Attitudes or opinions of people on issues (e.g smoking, tourism, sport) • Any other human rights and inclusivity issues	Within LO2: Patterns Functions and algebra 9.2.5 Draws graphs on the Cartesian Plane for given equations (in two variables), or determines equations or formulae from given graphs using tables where necessary Across Life Orientation LO3: Personal development 9.3.1: Analyses and reflects on positive personal qualities in a range of contexts 9.3.2 Critically discusses own rights and responsibilities in	Drawing of different kind of graphs to interpret data Interpretation of data	Graph papers Mathematical sets Text books Magazines News papers Magazine	Forms of Ass: Class work Home work Assignment Test Project Method Teacher Group Self / peer Tools Memorandum Rubric	Cooperative Group work Question and answer Discussion Problem posing Brain storming Individual Work

		interpersonal relationships. Social Sciences LO1: Geographical Enquiry As: Analyses and reaches conclusions about information from sources such as photos, maps and atlases graphs and statistics (work with sources				

TERM	LOs and ASs	Integration	Content in Context	Resources	Assessment Strategies	Teaching and Learning Strategy
3 Week 1- 3	<u>Cluster 1 (LO1)</u> LO1: Number Recognition 9.1.3 Solves problems in context including context that may be used to build awareness of other Learning Areas, as well as human rights, social, economic and environmental issues such as: • Financial (including profit and loss, budget, accounts, loans, simple and compound interest, hire purchase, exchange rates, commission, rentals and banking); • Measurements in Natural Sciences and Technology contexts. 9.1.4 Solves problems that involve ratio, rate and proportion (direct and indirect).	Within: LO 4: Measurement 9.4.1 Solves ratio and rate problems involving time, distance and speed. 9.4.2 Solves problems- including problems in contexts that may be used to develop awareness of human rights, social, economic, cultural and	Problem solving including profit and loss, budgets, hire purchase, accounts, compound and simple interest, direct and indirect proportion and finances.	Text book Bank statements Newspapers Magazines Catalogues Deposit slips TV	Forms of Ass: Class work Tests Homework Project Assignment Investigation Verbal presentation Method Teacher Group/ peer Tools Memorandum Rubric Checklist	Group work Problem posing

		environmental issues- involving known geometric figures and solids in range of measurement contexts. Across: EMS LO 2: Sustainable growth and development. 9.2.3 Explains the role of savings and investments in economic prosperity and growth				
Week 4	Cluster 1 (LO4) Problem solving 9.4.1 Solves ratio and rate problems involving time, distance and speed.	Within LO 1: Numbers, operations and relationships. 9.1.5 Estimates and calculates by selecting and using operations appropriate to solving problems and judging the reasonableness of results (including measurement problems that involve rational approximations of irrational numbers	Solving problem involving time , distance and speed	Text books Watch Stop watch Tape measure Thrundle wheel Meter sticks Ruler	Forms of Ass: Class work Tests Homework Assignment Method Teacher Group/ peer Tools Memorandum Rubric	Group and individual work Problem posing Brain storming
Week	Cluster 3 (LO4) Pythagoras	Within	Use of Pythagoras	Text books	Forms of Ass	Investigation

5-6	9.4.4 Uses the Theorem of Pythagoras to solve problems involving missing lengths in known and solids	LO 3: Space and Shape 9.3.3 Uses geometry of straight lines and triangles to solve problems and to justify relationships in geometric figures	Theorem to solve problems.	Mathematical set Square Grids	Class works Tests Home works Methods Teacher Self Tools Memorandum	Cooperative Group work Discussions
Week 7- 8	Cluster 4 (LO3) Straight line Geometry 9.3.3 Uses geometry of straight lines and triangles to solve problems and to justify relationships in geometric figures		Straight line Geometry	Text book Mathematical set	Forms: Class work Tests Homework Method Teacher Self Tools Memorandum Rating scale	Question and answers Discussions
Week 9-10	Cluster 3(LO5) Probability 9.5.6 Considers situations with equally probable outcomes, and: • Determines probabilities for compound events using two-way tables and tree diagrams; • Determines the probabilities for outcomes of events and predicts their relative frequency in simple experiments; • Discusses the differences between the probability of outcomes and their relative	Within: LO 1: Numbers, operations and relationships. 9.1.4 Solves problems that involve ratio, rate and proportion (direct and indirect). LO 2: Patterns, functions and algebra. 9.2.2	Probability using two way tables and tree diagrams.	Text books Coins Dice TV set Newspapers	Forms: Class work Tests Homework Method Teacher Self Tools Memorandum Rating scale	Cooperative group work Discussions Question and answer

	frequency.	Represents and uses relationships between variables.				
TERM 4	REVISION and CTA ADMINISTRATION					

GRADE 7 LESSON PLAN

Date:	**Learning Area: Mathematics**	**Number of lessons:**	**Grade: 7**
Duration: 8 Hours 15 minutes	**Content in context**		
Selected LOs and ASs	**Learning Activities**	**Details of assessment Forms, Methods and Tools**	**Provision for learners with barriers to learning**
LO 1: Numbers, operations and relationships. CLUSTER 1 7.1.1 Counts forwards and backwards in the following ways: • In decimal intervals • In integers for any intervals. 7.1.3 Recognises, classifies and represents the following numbers in order to describe and compare them: • Integers • Decimals(to at least three decimal places),fractions and percentages; • Factors including prime factors of three digit whole numbers; • Numbers in exponential form including squares of natural numbers to a least 12^2, cubes of natural numbers to at least 5^3, and their square and cube roots. Integration: Mathematics LO2: Patterns, Functions and Algebra. AS 1: Investigates and extends numeric and geometric patterns. LO 4: Measurement AS 3: Solves problems using a range of strategies including: • Calculating to at least two decimal places	Activity 1 (1Hour) • Teacher divides learners into groups • Give different groups different work sheets(others counting forwards and others counting backwards in both whole numbers and decimals) Learners have to complete the following task : a) 0,90; 0,75 ; ---;---;---. b) 1,25; 1,10; ----; ---- ;---. c) 2,125; 2,155; --- ;---; ---. d) 6175;6300;;---; ---; ---. e) 43 400; 43 175; ---; ---;---. • Exchange the worksheets among groups Activity 2 (15 minutes) Introduce the idea of negative whole numbers by referring to concrete examples that learners are already familiar with , e.g. • Temperatures in very cold regions in South Africa and other parts of the world. • Bank statements may reflect a negative balance if you owe the bank money. • It may refer to how deep a ditch is below the surface of the ground . • Learners are prompted to give	Form: • Classwork • homework Method: • Learner assessment • Teacher assessment Tools • Memorandum Form: • Informal questions Method: • Teacher assessment • Peer assessment Tools: • Verbal interaction	The teacher has to use simple language but guard against compromising important mathematical terminology. Individual attention is given to struggling learners. Mixed ability groups are taken care of timeously.

	more examples. • <u>Activity 3(1Hour)</u> Learners give the first five elements of the following sets : i) Natural numbers ii) Counting numbers iii) Negative whole numbers The teacher explains that negative whole numbers together with the counting numbers form a set of Integers. • Represent the integers as an Infinite set : Z= {….. -3; -2 ; -1; 0; +1; =2 ; +3; ……} • Represent the set of integers on a number line. • Note: It is a good idea to view the number line in a vertical position initially so that the idea of order may easily be explained. (As an object moves up the line , the height of the object becomes greater) • In the horizontal position numbers become larger as we move to the right and smaller as we move to the left. Activities should include the following types of questions : a) Indicate the position of the following numbers on the number line : 7; -12; 0 ; -8. b) Arrange in order of increasing size : -56; 45; 0; 11; -28 c) Use the > and < signs to show which of the following is bigger or	Form: • Worksheet • Assignment Method: • Learner assessment • Teacher assessment Tools: • Marking memorandum Form: • Classwork • homework Method: • Learner assessment • Teacher	

	smaller than : i) -5 …..5 ii) -7 ….. -8 iii) 0 …… -6 Activity 4 (3 Hours) • Revise the concept of common fractions as a part of the whole e.g. a loaf divided into four equal parts – each part is a quarter. • Extend to other examples within the same approach : 1/3; 1/8; 2/5; … • These are also known as proper fractions • Learners are guided to differentiate between proper and improper fractions , such as 4/7; 8/3; ….. • They define these types of fractions • Sometimes we write improper fractions as : 7/4=4/4 +3/4 = 1+3/4=1 ¾ • 1 ¾ is a mixed fraction. • Introduction of the concept of percentages , e.g. 12 % means 12 out of a hundred or 12/100 . Complete this table : Percentage | Common fraction | Decimal fraction | ……$^{3}/_{8}$ | …… 15 | …… | …… | …….. | ……2,4…. Activity 5(2 hours) • Divide learners into groups • Each group is given four	assessment Tools: • Marking memorandum Form: • Classwork • homework Method: • Learner assessment • Teacher assessment Tools: • Marking memorandum	

	natural numbers above 20 • Learners are required to investigate which other natural numbers can divide the given natural numbers without a remainder • From the learner's responses, the teacher introduces factors Example: No | Factors of 15 15 | 1; 3; 5; 15 • Oral exercises, e.g. Give / what are the factors of 30; 27;… etc • Learners are required to give different types of numbers (e.g. whole , natural , odd , etc) and describe each. <u>Activity 6 (1 hour)</u> • The teacher asks learners questions about the long and short way of writing a number if it repeatedly multiplies itself e.g. $2 \times 2 \times 2 \times 2 \times 2 = 2^5$ $3 \times 3 = 3^2$ $1 \times 1 \times 1 = 1^3$ • The teacher introduces exponential form b y explaining powers (base and index/exponent) • Introduce a square as a number multiplied by itself once e.g. $3x3 = 3^2 = 9$. Thus 9 is a square . A cube is a number multiplied by itself 3 times e.g. $3x3 \times 3 = 3^3 = 27$.	Form: • Classwork • homework Method: • Learner assessment • Teacher assessment Tools: • Marking memorandum Form: • Classwork • homework Method: • Learner assessment • Teacher assessment Tools: • Marking memorandum	Lot of practise be given on activities involving exponents and multiplication.

	Thus 27 is a cube Learners list the squares of the first twenty natural numbers and cubes of the first ten natural numbers.		

Resources: • Worksheets • Bank statements • Thermometer • Textbooks • Magazines and newspapers • Workbooks • Rulers • Weather map
Teacher Reflection:
Expanded opportunities:.

Date:	Learning Area: Mathematics	Number of lessons: 6	Grade 8
Duration:6 Hours	Content in context: Rational Numbers		
Selected LOs and ASs	Learning Activities	Details of Assessment Forms, Methods and Tools	Provision for learners with barriers to learning
LO1 Number, operations and relationships. **CLUSTER 1** 8.1.1 Describes and illustrates the historical development of numbers (e.g. irrational numbers) 8.1.2 Recognises, classifies and represents the following numbers in order to describe and compare them: • Irrational numbers in the context of measurement (e.g. π and square and cube roots of non-perfect squares and cubes. • Multiples and factors; • Numbers written in exponential form including squares and cubes of natural numbers and their square and cube roots;	Activity 1 (1 Hour) • Divide learners into groups. • Give each group an article on the history of a particular number (e.g. π, 0 or $\sqrt{2}$), a group of numbers (e.g. prime numbers) or different number systems. • Each group reads the article, discusses it and gives a report back to the larger group. • Learners are expected to do a write up on the topic that they had read and discussed. Activity 2 (2 hours) • Introduce learners to the different types of numbers in our number system. These include: • Natural numbers: 1; 2;3;… • Counting numbers: 0;1;2;3;.. • Revise the idea of multiples, factors, highest common factors (HCF) and lowest common factors (LCM) • Use the knowledge gained above to distinguish between Prime numbers and composite numbers. Activity 3 (1 Hour) • Learners may now be expected to conduct an investigation to determine the rules of divisibility. Activity 4 (2 Hours) • Introduce the idea of squares and cubes by asking learners to write the following numbers as a product of its factors in as many ways possible: 1; 4; 9; 16…. 1; 8; 27; …	**Form** Class work Assignment **Method** Teacher Assessment **Tool** Rubric **Form** Home work Assignment **Method** Teacher Assessment **Tool** Rubric **Form** Investigation **Form** Investigation **Method** Teacher Assessment **Tool** Marking Memorandum	Ensure that the language used is simple and clear. Do not introduce too many new ideas at a time. Give learners enough time to practice.

	• Initiate a class discussion so that learners may share their observations. (Learners are expected to notice that all these numbers can be written as a product of the same factor) • Learners may now generate their own square and cube numbers. $2 \times 2 =$ $3 \times 3 \times 3 =$ $5 \times 5 =$ $5 \times 5 \times 5 =$ • Learners must also be able to complete the following type of exercise in preparing them for the concept of square root and cube root: a) $\square \times \square = 25$ b) $\square \times \square \times \square = 64$ • Define the square root of a number as the factor that must be multiplied by itself **twice** in order to equal the number. (i.e. the number that goes into the block in a) above) • Similarly define the cube root of a number as the factor that must be multiplied by itself **three times** in order to equal the number (i.e. the number that goes into the block in b) above) • Now we may introduce the appropriate notation: $\sqrt{25} = 5 \Leftrightarrow \boxed{5} \times \boxed{5} = 25$ $\sqrt[3]{64} = 4 \Leftrightarrow \boxed{4} \times \boxed{4} \times \boxed{4} = 64$ • Define perfect squares and cubes and prompt learners to give examples of non-perfect squares and cubes.		
Resources: • Text books • Calculator • Library books			
Teacher reflection			
Expanded Opportunities			

MATHEMATICS LESSON PLAN 2

Date:	Learning Area: Mathematics	Number of lessons:4	Grade 8
Duration: 3 Hours, 30 minutes.	Content in context: Rational Numbers		
Selected LOs and Ass	Learning Activities	Details of Assessment Forms, Methods and Tools	Provision for learners with barriers to learning
LO1 Number, operations and relationships. **CLUSTER 1** 8.1.2 Recognises, classifies and represents the following numbers in order to describe and compare them: • Integers • Additive and multiplicative inverses;	Addition of Integers <u>Activity 1</u> (15 minutes) Give the learners worked out examples such as these below and ask them if they can figure out how to use the number line to obtain the given answer: 1. (+6) +(+2) = +8 2. 0 + (+5) = +5 3. +10 +(-8) = 2 4. 0 + (-5)= -5 5. (-6) +(+8) = +2 6. (-3) + (-2) = -5 (Ask learners whether the order of the addends has an effect on the final answer) <u>Activity 2</u> (2 Hours) Now introduce the idea of additive inverses by extending the above exercise as shown below: 1. (-5) + (+5) = 2. +2 + (-2) = 3. (-10) + (+10) = (At this stage the learners would have recognized the fact that a positive whole number cancels its negative and vice versa) The above knowledge may now be used to make the addition of integers easier and faster by recognizing the following:	**Form** Worksheet Assignment **Method** Teacher Assessment/Peer assessment **Tool** Marking memorandum **Form** Assignment/Investigation **Method** Teacher Assessment/Peer assessment **Tool** Marking memorandum	Ensure that the language used is simple and clear. Do not introduce too many new ideas at a time. Give learners enough time to practice.

	• $-8 + 12 = -8 + (+8) + (+4) = +4$ • $-9 + 7 = -2 + (-7) + (+7) = -2$ • -9 +(-5)= -14 (no cancellation) • $+9 + (+5) = +14$(no cancellation) **An alternative approach:** Prompt learners to form sentences such as these below: $-8 + 12$ Could mean that I owe someone R 8 and I have R 12. If I pay what I owe, I am left with R 4. Since this is what I have (+) and not what I owe (-), the answer is +4 $-9 + 7 =$ Could mean that I owe someone R 9 but I only have R 7. If I pay what I owe, I still owe that person R 2. Since this is what I owe (-) and not what I have (+), the answer is -2 • -9 +(-5)= Could mean I owe two people money. Therefore I owe R 14 in total. The answer is - 14 • $+9 + (+5)$= Could mean that I have R 9 and I gain another R 5, I now have R 14.The answer is therefore +14. Exercises must include the following types of questions: 1. $(-5) + (+10) =$ 2. $(+15) + (-13) =$ 3. $(-8) + (-4) =$	**Form** Homework Assignment **Method** Teacher Assessment/Peer assessment **Tool** Marking memorandum	Do not be hasty. Give them the allotted time. It will **save** the teacher time in the end. If most of the learners did not discover the method on their own, ask the ones that did discover it on their own to explain the method to the other learners. This type of co-operative learning is beneficial to both the one who explains as it is to the one who listens. The teacher then gives an overview of the method so as to ensure that there is no confusion.
Resources: • Text books • Calculator			
Teacher reflection			
Expanded Opportunities			

MATHEMATICS LESSON PLAN 3

Date:	Learning Area: Mathematics	Number of lessons:3	Grade 8
Duration:3 Hours	Content in context: Rational Numbers		
Selected LOs and ASs	Learning Activities	Details of Assessment Forms, Methods and Tools	Provision for learners with barriers to learning
LO1 Number, operations and relationships. **CLUSTER 1** 8.1.2 (Continued) Recognises, classifies and represents the following numbers in order to describe and compare them: • Integers • Additive and multiplicative inverses;	<u>NOTE:</u> The order of teaching the operations on integers: Addition⟶Multiplication⟶Division⟶Subtraction. <u>Activity 1</u> (1 Hour) (Multiplication and Division of Integers) The concept of multiplication of negative numbers may be approached in the following way: 1. Study the table below and fill in the missing values (Start at the top and work your way down). $2 \times (+6) =$ $2 \times (+5) =$ $2 \times (+4) =$ $2 \times (+3) =$ $2 \times (+2) =$ $2 \times (+1) =$ $2 \times (0) =$ $2 \times (-1) =$ $2 \times (-2) =$ $2 \times (-3) =$ $2 \times (-4) =$ $2 \times (-5) =$ Questions: a) Do you notice any pattern? b) Describe how you would obtain the next value as you work down the list. c) Can you develop a rule for the following? $(+) \times (+) =$ $(+) \times (-) =$	**Form** Homework Assignment **Method** Teacher Assessment **Tool** Rubric	Ensure that the language used is simple and clear. Do not introduce too many new ideas at a time. Give learners enough time to practice Learners that do not see the pattern in Activity 1 may represent each successive answer on a number line.

	2. Study the table below and fill in the missing values: $-2 \times (+6) = -12$ $-2 \times (+5) = -10$ $-2 \times (+4) = -8$ $-2 \times (+3) =$ $-2 \times (+2) =$ $-2 \times (+1) =$ $-2 \times (0) =$ $-2 \times (-1) =$ $-2 \times (-2) =$ $-2 \times (-3) =$ $-2 \times (-4) =$ $-2 \times (-5) =$ Questions: a) As you work from the top to the bottom are the answers becoming bigger or smaller? b) By how much are the answers increasing or decreasing as you move down one step at a time? c) Can you develop a rule for the following? $(-) \times (+) =$ $(-) \times (-) =$ It is **important** that learners develop the following **general rule:** • When multiplying TWO integers of **different signs**, the answer is $(-)$ • When multiplying TWO integers of the **same signs**, the answer is $(-)$ When dealing with division of integers, the same rules that apply to multiplication of integers applies. It is easy to show as multiplication and division are inverse operation.		Learners are advised to use the number line in order to see the pattern.

	Activity 2 (1 Hours) Exercises may include the following types of questions: Simplify: a) $(-5) \times (7) =$ b) $(-8) \times (-2) =$ c) $(3) \times (-7) =$ d) $(-4) \times (4) =$ e) $(-5) \times (7) \times (-2) =$ f) $(-5) \times (-3) \times (-2) =$ g) $(-1) \times (4) \times (-2) =$ h) $(-5) \times (7) \times (-2) \times (-9) =$ i) $(2) \times (-8) \times (3) \times (4) =$ j) $(-2) \times (-2) \times (-2) \times (-2) =$ k) $\frac{-15}{3} =$ l) $\frac{-8}{-2} =$ m) $\frac{(-5).(-7).(2)}{-10}$ n) $-(+7) =$ o) $-(+2) =$ p) $-(-7) =$ q) $-(+8) =$	**Form** Homework Assignment **Method** Teacher Assessment **Tool** Rubric	
	Activity 3 (1 Hour) (Subtraction of Integers) The problem, $(-7) - (+8)$, should be dealt with as follows: Step 1: Remove the brackets by multiplying $+(-7) - (+8) = -7 - 8 =$ Step 2: Now add in the usual way: $-7 - 8 = -15$ Some more examples: • $(-6) - (-7) = -6 + 7 = +1$ $16 - (8) = 16 - 8 = +8 = 8$ • $(3) - (-5) + 10 = 3 + 5 + 10 = 18$ • $(17) - (+2) = +17 - 2 = 15$	**Form** Homework Assignment **Method** Teacher Assessment **Tool** Rubric	After learners have engaged in working with addition, multiplication, division and subtraction of integers as individual tasks, they must be given an opportunity to do a mixed bag of exercises as a summative assignment. Give learners enough time to complete this task in class. (1 or 2 lessons)

	Give learners an assignment that covers all the different aspects above. Ensure that learners spend enough time on this section as it forms the foundations of all the other work done in grade 8.		This exercise is important as it is where the confusion between $(+5) \times (-6)$ and $(+5) + (-6)$ may be clarified if necessary.
Resources: • Text books • Calculator			
Teacher reflection			
Expanded Opportunities			

Comment

- Please note that the times indicated for each activity above refers to the actual contact time. Learners need to be engaged in more consolidation tasks such as homework or assignments.
- Note that all the assessment standards for cluster 1 in term 1 (refer to work schedule) have **not** been done in this exemplar of a lesson plan.
- This exemplar serves merely as a guide and other approaches are welcome.
- Note how the investigative approach has been employed in many difficult concepts above.

GRADE 8 ASSESSMENT TASK

ASSESSMENT TASK: INVESTIGATIONS **TERM: 1**
ASSESSMENT TOOL: MEMO AND RUBRIC **TOTAL: 30**
LO2: AS 1.1; 2.3;1.5; & 1.6

ACTIVITY 1

A wholesaler company sells mealie-meal bags (10kg) to local shops and the table below shows number of bags sold per day during the week leading to Christmas.

No. of days	1	2	3	5	8	c
No. of bags	100	200	300	a	b	1 200

1.1 Complete the table given above (3)
1.2 Determine the general formula for the pattern above (1)

ACTIVITY 2: LO AS 2.2
Complete by adding two more terms, the 10^{th} and the nth terms
2.1 1;5; 9;… (4)
2.2 8;11;14… (4)
2.3 1;2;4;8;… (4)
2.4 10;30;90;270;… (4)
2.5 3;9;19;33… (4)

ACTIVITY 3
Draw your own diagrammatic pattern (2)
Describe the relationship in your own words (2)
Generalise the pattern (2)

GRADE 8 ASSESSMENT TASK

ASSESSMENT TASK: INVESTIGATION
ASSESSMENT TOOL: MEMORANDUM
LO 2 AS 2.1- 2.6
TOTAL MARK 30

ACTIVITY 1:

a=500√ b=800√; c=12√
Tn =100n√

ACTIVITY 2
2.1 13√;17√ Tenth term=37√ Tn=4n-3 √
2.2 17√; 20; √ Tenth term=35; √ Tn= 3n+5√
2.3 16√;32√; Tenth term =512√; Tn=2^{n-1}√
2.4 810√;2430√; Tenth term=196830√ Tn =10.3^{n-1}√
2.5 51√, 73; √ Tenth term=201 √ Tn=$2n^2$+ 1√

ACTIVITY 3
3.1 √ D LP DLP- diagrams leading to a pattern
√ √ D ICP DICP diagrams indicating clear patterns

3.2 √ PDR PDR- Partially describes a relationship
√ √ TDR TDR – Totally describes a relationship

3.3 √ SRCR SRCR- Slighty related to correct rule
√ √ CR CR – Correct rule

LEARNING PROGRAMME
MATHEMATICS
INTERMEDIATE PHASE

GRADE	LOs AND ASs	INTEGRATION	CONTENT IN CONTEXT	RESOURCES
4	**LO 1 : NUMBERS,OPERATIONS AND RELATIONSHIPS** CLUSTER 1 [LO 1] 4.1.1 Count forwards and backwards in 2s, 3s, 5s, 10s, 25s, 50s and 100s between 0 and 10 000. 4.1.2 Describes and illustrates various ways of counting in different cultures (including local) throughout history. 4.1.3 Recognises and represents the following numbers in order to describe and compare them : • Whole numbers to at least 4-digit numbers (including expanded notation of numbers to 1000) ; • Common fractions with different denominators including halves, quarters, and eighths; • Common fractions in diagrammatic form; • Decimal fractions of the form 0,5 in the context of measurement; • Odd and even numbers to at least 1000. • Multiples of single-digit	Mathematics LO 2: Patterns, Functions and Algebra AS 2: Investigates and extends numeric and geometric patterns looking for a relationship or rules. AS 5: Poses simple questions about own school and family environment, and identifies appropriate data sources in order to address human rights, social, political, cultural, environmental and economic issues in that environment. Life Orientation LO 2 Social Development AS: Compares the relationships between adults and children in a variety of situations in different cultural contexts.	Number Recognition and place values in whole numbers . Common Fractions, halves, quarters and eighths. Decimal fractions 1st decimal place such as 0,5 ; odd and Even numbers. Multiples of single digit numbers.	Abacus Calculators Number Grid Wall charts Fraction walls Fraction diagrams Counters Bottle tops Stones

	numbers to at least 100. 4.1.4 Recognises the place value of digits in whole numbers to at least 3-digit numbers. 4.1.5 Recognises and uses equivalent forms of the numbers listed above : • Common fractions with denominators that are multiples of each other; • Decimal fractions of the form 0,5; 1,5 and 2,5 and so on ,in the context of measurement			
5	**LO 1 : NUMBERS,OPERATIONS AND RELATIONSHIPS** CLUSTER 1 [LO 1] 5.1.1 Counts forwards and backwards in whole number intervals and fractions. 5.1.2 Describes and illustrates different ways of writing numbers in different cultures (including local) throughout history. 5.1.3 Recognises and represents the following numbers in order to describe and compare them: • whole numbers to at least 4-digit numbers; • common fractions to at least eights; • decimal fractions of the form 0,5, 1,5 and 2,5 and so on, in the context of measurement; • 0 in terms of additive inverses;	Mathematics LO 4: Measurement AS 1: Reads, tells and writes analogue, digital and 24 hour time to at least the nearest minute and second Life Orientation: AS: Compares the relationships between adults and children in a variety of situations in different cultural contents.	Counting backwards & forwards in whole numbers & fractions. Counting in different cultural styles Recognition and representation of : Whole numbers; Common Fractions; Decimal fractions and Place value.	Counters Number grid Abacus Watch Number lines Fraction wheel and Strips Worksheet Play money

	• 1 in terms of multiplicative inverses; • multiples of single-digit numbers to at least 100; • factors of at least any 2-digit whole numbers. 5.1.4 Recognises the place value of digits in whole numbers to at least 4-digit numbers. 5.1.5 Recognises and uses equivalent forms of the numbers listed below: • common fractions with den. That are multiples of each other. • decimal fractions of the form 0,5 1,5 and 2,5 and so on, in the context of measurement..			
6	**LO 1 : NUMBERS,OPERATIONS AND RELATIONSHIPS** CLUSTER 1 [LO 1]: 6.1.1 Counts forwards and backwards in decimals 6.1.2 Describes and illustrates written number systems different to own e.g. Roman Number Systems, Egyptian, etc. 6.1.3 Recognises and represents the following numbers in order to compare: • to a minimum of 6-digit whole numbers. • common fractions including specifically tenths, • 0 in terms of its additive property.	Mathematics LO 4: Measurement AS 4: Reads, tells and writes analogue, digital and 24-hour time to at least the nearest minute and second.	Counting in decimals Description and illustration of number systems Recognition of place values	Counters, number grid, abacus ,number line, wall clock

	• 1 in terms of its multiplicative property. multiples and factors of 2-digit whole numbers. 6.1.4 Recognises the place value of digits in whole numbers to 6-digits. 6.1.5 Recognises and uses equivalent forms of the numbers listed above, including: • common fractions with 1 digit or 2-digit denominators; • decimal fractions to at least 2 decimal places; percentages			
4	**LO 1 : NUMBERS,OPERATIONS AND RELATIONSHIPS** CLUSTER 2 [LO 1] 4.1.6 Solves problems in context including contexts that may be used to build awareness of other Learning Areas, as well as human rights, social , economic and environmental issues such as : • Financial (including buying and selling, and simple budgets); • Measurements in Natural Sciences and Technology contexts. 4.1.7 Solves problems that involve: • comparing two or more quantities of the same kind (ratio); • comparing two quantities of	Mathematics LO 2: Measurement AS 3: Writes number sentences to describe a problem situation , including problems within context that may be used to build Awareness of human rights, social, economic, cultural and environmental issues. EMS LO 3: AS 3: Completes source documents (e.g. receipts; deposit slips ; cheques) AS 6: Investigates the	Problem solving; Buying and selling Simple budgets Estimations and calculations Rounding off Addition and subtraction of whole numbers.	Financial Statements Calculators Workbooks

	different kinds (rate, e.g. kg/R) 4.1.11 Uses a range of strategies to check solutions and judges the reasonableness of solutions.	various methods of savings and investments (e.g. savings, accounts, fixed deposits, shares, unit trusts) , and calculates returns on a variety of investments . AS 4.4: Evaluates the financial viability of business (e.g. start up costs , production costs , sales, profit)		
5	**LO 1 : NUMBERS,OPERATIONS AND RELATIONSHIPS** CLUSTER 2 [LO 1] 5.1.6 Solves problems in context including contexts that may be used to build awareness of other Learning Areas, as well as human rights, social, economic and environmental issues such as: • financial (including buying and selling, profit and loss, and simple budgets) • measurements in Natural Sciences and Technology contexts. 5.1.7 Solves problems that involve: • comparing two or more quantities of the same kind (ratio); • comparing two quantities of different kinds (e.g. learners/teachers) 5.1.11 Uses a range of strategies to	Mathematics LO 4: Measurement AS 6:Solves problems involving selecting, calculating with and converting between appropriate SI units listed above, integrating appropriate context in Technology and Natural Science EMS 5.4.3 Identifies enterprises and events in own community where specific goods & services are being sold to satisfies consumer's needs & generate profit	Problem Solving Profit and Loss Simple Budgets Estimations using the four basic operations. Rounding off of Numbers Comparison of quantities (Ratio and rate)	Play Money Cashbook Newspapers (adverts) Charts Mass pieces Stones Measuring jugs

	check solutions and judge the reasonableness of solutions. •			
6	**LO 1 :** **NUMBERS,OPERATIONS AND RELATIONSHIPS** **CLUSTER 2 [LO 1]** **6.1.6 Solve problems in context including contexts that may be used to build awareness of other Learning Area, as well as human rights, social and environmental issues such as:** • **financial (including buying and selling, profit and loss, simple budgets, reading and interpreting accounts and discounts)** • **Measurements in Natural Science and Technology contexts.** **6.1.7Solves problems that involve :** • **comparing two or more quantities of the same kind (ratio).** **6.1.11Uses a range of strategies to check solutions and judge reasonableness of solutions.**	**MATHEMATICS** **LO 2: Patterns, functions and algebra** **6.2.4: Writes number sentences to describe a problem situation including problems within contexts that may be used to build awareness of human rights, social, economic, cultural and environmental issues.** **EMS** **LO 4 :** **Identifies a variety of possible business opportunities in the community**	**Problem solving in different contexts.** **Measurement in different in different context.**	**Coins, play money** **cash book statements**
	LO 1 : **NUMBERS,OPERATIONS AND RELATIONSHIPS** **CLUSTER 3 [LO 1]** **4.1.8 Estimates and calculates by selecting and using operations appropriately to solving**	**Life Orientation** **AS 3: Applies appropriate study skills**	**4 basic operations using whole numbers.** **Rounding off.**	**Calculator** **Number Grid**

4	**problems that involve:** • **Rounding off to the nearest 10;100 or 1000** • **Addition and subtraction of whole numbers with at least 4 –digits** • **Addition of common fractions in context;** • **Multiplication of at least whole 2 – digit numbers;** • **Division of at least 3-digit by 1 – digit numbers;** • **Equal sharing with remainders.** **4.1.9 Performs mental calculations involving :** • **Addition and subtraction of a single digit to a 2-digit number e.g. 53+4;63+4; 72-5; 62-5.** • **Multiplication of whole numbers to at least 10x10 (single digit numbers)** **4.1.10 Uses a range of techniques to perform written and mental calculations with whole numbers including :** • **Building –up and breaking down numbers;** • **Rounding off and compensating;** • **Doubling and halving;** • **Using a number line;** • **Using a calculator.**		**Building up and Breaking down numbers** **Addition of common fractions.** **Mental calculations based on addition and subtraction of 1- digit and 2- digit numbers.** **Multiplication of whole numbers to at least (10 x10)**	

	LO 1 :			

5	**NUMBERS,OPERATIONS AND RELATIONSHIPS** **CLUSTER 3 [LO 1]** **5.1.8Estimates and calculates by selecting and using operations appropriate to solving problems that involve:** • **rounding off to the nearest 10, 100 or 1 000;** • **addition and subtraction of whole numbers with at least 4 digits;** • **addition of common fractions with the same denominator and whole numbers with common fractions (mixed numbers);** • **multiplication of at least whole 2-digit by 2-digit numbers to 500;** • **division of at least whole 3-digit by 1-digit numbers;** • **finding fractions of whole numbers which result in whole numbers;** **5.1.9** **Perform mental calculations involving ;** • **addition and subtraction** • **multiplication of whole numbers to at least 10x10.** **5.1.10 Uses a range of techniques to perform written and mental calculations with whole numbers including:** • **Adding and subtracting in columns;** • **Building up and breaking down**	**Mathematics** **LO 5: Data Handling** **AS 4: Solves problems involving calculations and conversions between appropriate time units including decades centuries and millennia**	**Rounding Off** **Four Basic Operations using Whole Numbers up to 4 digit numbers** **Addition of common fractions with same denominator**	**Counters** **Number grid** **Abacus** **Number lines** **Calculators** **Fraction walls, strips** **Concrete objects**

	numbers; • Rounding off and compensating; • Doubling and halving; • Using a calculator.			
6	**LO 1 : NUMBERS,OPERATIONS AND RELATIONSHIPS** **CLUSTER 3 : [LO 1]** 6.1.8-Estimate and calculate by selecting and using operations appropriate to solving problems that involve : • rounding off to the nearest 5, 10, 100, or 1000. • addition and subtraction of whole numbers addition and subtraction of whole numbers with common fractions (mixed numbers); • multiplication of at least whole 3-digit by 2-digit numbers; • division of at least whole 3-digit by 2-digit numbers; • finding fractions of whole numbers. • equivalent fractions; • multiple operations on whole numbers with or without brackets. 6.1.9 Mental calculations using a range of techniques for addition, subtraction and multiplication within the number range dealt with.	**MATHEMATICS** LO 2 : Patterns, functions and algebra AS 3: Determines output values for given input values using : • verbal descriptions • flow diagrams LO 4 : Measurement AS 1: Reads, tells and writes analogue, digital and 24-hour time to at least the nearest minute and second.	Estimation, rounding off, four basic operations using whole numbers and fractions Mental calculations using range of techniques.	Counters, number grid, abacus ,number line, wall clock

	6.1.10 Use a range of techniques to perform written mental calculations with whole numbers including : • **adding and subtracting in columns;** • **building up and breaking down numbers.** • **rounding off and compensating;** • **using a calculator in columns;** • **building up and breaking down numbers.** • **rounding off and compensating;** **using a calculator.**			
4	**<u>CLUSTER 4 [LO 1]</u>** **4.1.12 Recognises, describes and uses:** • **The reciprocal relationship between multiplication & division (e.g. If 5 x3 = 15 then 15 ÷ 3 = 5 and 15 ÷ 5 = 3) ;** • **The equivalence of division & fractions (e.g. 1 ÷ 8 = $^1/_8$);** • **The commutative, associative and distributive properties with whole numbers (the expectation is that learner should be able to use properties and not necessarily know the names).**	**<u>Mathematics</u>** **LO 2 : Patterns, functions and algebra** **AS 5 :** **Solves or completes number sentences by inspection or by trial and improvement , checking the solutions by substitution** **(e.g. ★ ÷ 4 = 12)**	**Reciprocal relationship between multiplication and division.** **Equivalence of division and fractions.** **Distributive properties.**	**Charts**
5	<u>CLUSTER 4 (LO 1)</u> 5.1.12 recognises, describes and uses:		**Reciprocal relationship between multiplication**	**Charts** **Worksheets**

	• the reciprocal relationship between multiplication and division(e.g. if 5×3=15 then 15÷5=3) • the equivalence of division and fractions(e.g. 1÷8=1/8); the commutative, associative and distributive properties with whole numbers(the expectation is that learners should be able to use the properties and not necessarily know the names).		**and division. Equivalence of division and fractions. Distributive properties.**	**Number grids Number cards Fraction wheels Fraction strips.**
6	**<u>CLUSTER 4 [LO 1]</u> 6.1.12Recognises, describes and uses: • divisibility rules for 2, 5, 10, 100 and 1000; the commutative, associative and distributive properties with whole numbers(the expectation is that learners should be able to use the properties and not necessarily know the names).**		**Recognition, use and description of divisibility rules.**	**Charts Worksheets Number grids Number cards**

4	**<u>LO: 2 PATTERNS,FUNCTIONS AND ALGEBRA</u> <u>CLUSTER 1 [LO2]</u> 4.2.1 Investigates and extends numeric and geometric patterns looking for a relationship or rules, including patterns : • Represented in physical or diagrammatic forms; • Not limited to sequences involving constant difference or ratio;**	**<u>Mathematics LO 1: Numbers, operations and relationships.</u> AS 1.1: Counts backwards and forwards in a variety of ways <u>Arts and Culture</u> LO 1 :Creating, Interpreting and Presenting**	**Numeric and Geometric Patterns Describing relationships and Formulating rules Creating patterns**	**Beads Matchsticks Number Grid Wall charts showing geometric designs Worksheets**

	• Found in natural and cultural contexts; • Of the learners` own creation. 4.2.2 Describes observed relationships or rules in own words.	AS : Uses voice , body and found or made instruments to explore sounds.		
5	LO: 2 **PATTERNS,FUNCTIONS AND ALGEBRA** CLUSTER 2[LO 2] 5.2.1Investigates and extends numeric and geometric patterns looking for a relationship or rules, including patterns: • Represented in physical or diagrammatic form; • not limited to sequences involving constant difference or ratio; • found in natural and cultural context • of the learner's own creation. 5.2.2 Describes observed relationships or rules in own words.	Mathematics LO1 Numbers, operations and relationships AS 1: Counts forwards and backwards in whole number intervals and fractions. AS 7: Solve problems that involve: • comparing two or more quantities of the same kind (ratio); • Comparing two quantities of different kinds (e.g. Learner /teacher) Arts & Culture LO 1: AS 8 – 9: Composes & present short rhythmic patterns	Investigation of Numeric & Geometric Patterns Formulation of Rules	Matchsticks Concrete objects Worksheets Number grids
6	LO: 2 PATTERNS,FUNCTIONS AND ALGEBRA CLUSTER 1 [LO 2] 6.2.1- Investigate and extend	Mathematics LO 3: Space and shape AS 1: Recognise, visualise	Investigation of patterns and rules.	2-dimensional shapes and 3-dimensional

	numeric and geometric patterns looking for a relationship or rules, including patterns: • Represented in physical or diagrammatic form • Not limited to sequences involving constant difference or ratio • found in natural and cultural contexts; • of the learner's own creation • represented in tables. 6.2.2- Describe observed relationships or rules in own words.	and name 2-D shapes and 3-D objects focusing on: • Similarities and differences between tetrahedrons and other pyramids. • Similarities and differences between rectangles and parallelograms.	Description and finding of relationships or rules.	objects

4	<u>CLUSTER 2 [LO2]</u> 4.2.3 Determines output values for given output values: • Verbal descriptions; • Flow diagrams. 4.2.4 Writes number sentences to describe a problem situation, including problems within contexts that may be used to build awareness of human rights, social, economic, cultural and environmental issues . 4.2.5 Solves or completes number sentences by inspection or by trial-and-improvement, checking the solutions by substitution (e.g. $\Delta \div 4 = 12$).	<u>MATHEMATICS</u> AS 1.1: Counts backwards and forwards in a variety of ways. <u>Mathematics</u> AS 1.9: Performs mental calculations involving addition and subtraction … AS 12: Recognises , describes and uses : The reciprocal relationship between multiplication and division ……..,.	Determination of input and output values verbally or using flow diagrams. Number sentences	Flow chart diagrams Strings Paper strips
	<u>LO: 2</u>			

5	**PATTERNS,FUNCTIONS AND ALGEBRA** **CLUSTER 2 [LO 2]** **5.2.3 Determines output values for given input values using:** • **Verbal descriptions** • **Flow diagrams**. 5.2.6 **Determines, through discussion and comparison, the equivalence of different descriptions of the same relationship or rule presented:** • **verbally;** • **In flow diagrams;** • **By number sentences.**	**Arts and Culture** **LO1** **AS1: Visual Arts** **Designs and creates artworks and craftworks which explore the use of natural and geometric shapes, shapes and forms in 2and 3 dimensions in observational work, pattern making and design and in simple craft objects**	**Identification and investigation of Geometrical and Numeric Patterns** **Creation of own patterns**	**Matchsticks** **Concrete objects** **Worksheets** **Number grids**
6	**CLUSTER 2[LO 2]** **6.2.3 Determines output values for given input values, or input values for given output values, using:** • **Verbal descriptions;** • **Flow diagrams;** • **Tables.** **6.2.6 Determine, through discussion and comparison, the equivalence of different descriptions of the same relationship or rule presented:** • **verbally.** • **in flow diagrams.** • **by number sentences** • **in tables**	**MATHEMATICS** **LO 1: Number , operation and relationships.** **AS 5:Recognise and use equivalent forms of the numbers listed above, including:** • **common fractions with 1-digit & 2-digit denominators.** • **decimal fractions to at least 2 decimal places.**	**Representing information and rules in a variety of ways.** **Determination of relationships or rules in different descriptions.**	**Number cards** **Worksheets** **Flow charts diagrams** **Number cards** **Worksheets** **Flow charts diagrams**

4	**CLUSTER 3 [LO 2]** **4.2.6 Determines, through discussion and comparison the equivalence of different descriptions of the same relationship or rule presented:** • **verbally:** • **in flow diagrams:** • **by number sentences.**	**Mathematics** **AS 1.9 Performs mental calculations involving:** • **addtition and subtraction;** • **multiplication of whole numbers to at least 10x10.**	**Determination of relationships or rules in different descriptions.**	**Number cards** **Worksheets** **Flow charts diagrams**
5	**CLUSTER 2 [LO 2]** **5.2.4 Write number sentences to describe a problem situation within a contexts that may be used to build awareness of human rights, social, economic, cultural and environmental issues** **5.2.5 Solve or complete number sentences by inspection or trial and improvement, checking the solutions by substitution,(e.g. * / 4 = 12)**	**Mathematics** **5.1.11** **Uses a range of strategies to check solutions and judge the reasonableness of solutions.**	**Solve/ complete Number sentences** **Writing Number Sentences in different contexts.**	**Newspaper** **Worksheets** **Books**
6	**CLUSTER 3 [LO 2]** **6.2.4 Write number sentences to describe a problem situation, within a context.** **6.2.5 Solve or complete number sentences by inspection or by trial-and-improvement, checking the solutions by substitution.**	**MATHEMATICS** **LO 1: Numbers, operations and relationships.** **AS 6: Solves problems in context including contexts that may be used to build awareness of other Learning Areas as well as human rights, social, economic and environmental issues.**	**Number sentences (Mathematical modeling)**	**Text books** **Newspapers** **(case study)**

	LO 3			

4	**SPACE AND SHAPE** **CLUSTER 1 [LO 3]** **4.3.1 Recognises, visualises and names 2 dimensional shapes and 3 dimensional objects in the environment including;** • **Rectangular prisms , spheres, cylinders and other objects ;** • **Prisms and pyramids ;** • **Circles and rectangles ;** • **Polygons in terms of the number of sides up to 8 sided figures.** **4.3.2 Describes, sorts and compares 2 -dimensional shapes and 3 - dimensional objects from the environment according to geometrical properties including :** • **Shapes of faces ,** • **Number of sides ;** • **Flat and curved surfaces , straight and curved sides.** **4.3.3 Investigates and compares (alone and/or as a member of a group or team) 2-dimensional shapes and 3- dimensional objects studied in this grade according to properties listed above by:** • **Making 3-dimensional models using cut-out polygons (supplied)** • **Drawing shapes on grid paper.** **4.3.6 Recognises and describes**	**Mathematics** **AS 4.5: Estimates, measures, compares and orders 2-D shapes and 3-D objects …** **Tech:** **LO 1: Technological processes and Skills** **AS 1.8** **Uses suitable tools and materials to make products by measuring, marking out, cutting simple forms in a form of materials ……** **Mathematics**	**2D shapes and 3D objects and their models** **Geometrical properties of 2D shapes and 3D objects e.g. rectangular prisms. Pyramidsetc.** **Description, sorting and comparison of shapes.** **Investigation and comparison of shapes.**	**Grid paper** **Pair of Compasses** **Glue** **Pair of Scissors** **2-D shapes and 3-D objects** **Pair of Compasses** **Glue** **Pair of Scissors** **2-D shapes and 3-D objects**

	natural and cultural 2 -dimensional shapes, 3 -dimensional objects and patterns in terms of geometric properties.	4.2.1 Investigates and extends numeric and geometric patterns looking for a relationship or rules, including patterns : • Represented in physical or diagrammatic forms; • Not limited to sequences involving constant difference or ratio; • Found in natural and cultural contexts; • Of the learners` own creation.	Recognising natural and cultural 2-D shapes and 3-D objects and patterns.	2-D shapes and 3-D objects.
5	<u>CLUSTER 1 [LO 3]</u> 5.3.1 Recognises, visualizes and names 2 -dimensional shapes and 3 -dimensional objects in natural and cultural forms and geometric settings including those previously dealt with and focusing on: • similarities and differences between cubes and rectangular prisms; • Similarities and differences between squares and rectangles.	<u>Mathematics</u> LO 4: Measurement AS : 5 Estimates, records, measures, compares and orders 2D shapes and 3D objects using SI Units…. <u>Technology</u> LO 1 AS: Produces labeled 2D drawings enhanced with colour where appropriate.	Recognition and properties of 2-D shapes and 3-D objects Models Nets	Concrete 2D shapes and 3D objects Grid papers Rulers Measuring tapes

	5.3.2 Describes, sorts and compares 2 -dimensional shapes and 3 - dimensional objects from the environment and from drawings or pictures according to properties including: • number and/or shape of faces; • Number and/or length of sides. 5.3.3 Investigates and compares 2-dimensional shapes and 3 -dimensional objects			
6	<u>CLUSTER 1 [LO 3]</u> : 6.3.1 - Recognise, visualise and name 2-D shapes and 3-D objects focusing on: • Similarities and differences between tetrahedrons and other pyramids. • Similarities and differences between rectangles and parallelograms 6.3.2 Describes and classifies 2-D shapes and 3-D objects in terms of properties: • faces, vertices and edges; • lengths of sides; angle size of corners 6.3.3 Investigate and compare 2-D shapes and 3-D objects according to properties listed above by: • make 3-D models using; - drinking straws to make a skeleton.	<u>MATHEMATICS</u> LO 4: Measurement AS 8: Investigates and approximates (alone and or as a member of a group or team): • perimeter using rulers or measuring tapes • area of polygons in order to develop rules for calculating the area of rectangles • volume /capacity of objects in order to develop rules for calculating volume of rectangular prisms. <u>Technology</u> LO1 AS: Draws appropriate sketches (e.g. labeled 2 – D	Recognition and visualization of 2-Dimesional shapes and 3-dimensional objects Investigation and comparison of 2-D shapes and 3-D objects. Making models of 3 – D objects.	Boxes, A4 and A3 papers, rulers and trundle wheels, scissors, pairs of compasses, drinking straws Grid paper Nets, paper plates. 2-D shapes and 3-D objects

	- nets provided by the teacher • drawing shapes on grid paper • using a pair of compass to draw circles, patterns in circles, and patterns with circles	drawings of ideas, enhanced drawing of final solutions and drawing showing measurements) to communicate different information appropriately and effectively.		
4	CLUSTER 2 [LO 3] 4.3.4 Recognises and describes lines of symmetry in 2 dimensional shapes, including those in nature and its cultural art forms. 4.3.5 Makes 2-dimensional shapes, 3 -dimensional objects and patterns from geometric objects and shapes (tan grams) with a focus on tiling (tessellation) and line symmetry.	Mathematics AS 2.1: Investigates and extends numeric and geometric patterns looking for a relationship or rules,	Line Symmetry and Tessellation Making 2 dimensional shapes Making 3dimensional models	Cardboards 2-D shapes e.g. boxes 3-D cardboard models Cubes Traffic signs Pictures
5	CLUSTER 2 [LO 3] 5.3.4 Recognises, describes and performs rotations (turns), reflections (flips) and translations (slides) using geometric figures and solids 5.3.5 Makes two-dimensional shapes, three-dimensional objects and patterns from geometric shapes and describes these in terms of: • tessellations • line and rotational symmetry; • movement including rotations, reflections and translations.	Mathematics LO 2: Patterns, Functions and Algebra AS 2: Describes observed relationships or rules in own words	Recognition, description and performance of rotation, reflection and translation. Making 2-D shapes and 3-D objects Tessellations, line, and	Geometric Shapes Transparency Pair of Scissor Koki Pens Grid papers Pins Tracing Paper Mirrors

	5.3.6 Recognises and describes natural and cultural 2-D shapes,3-D objects and patterns in terms of geometric properties.		rotational symmetry.	

6	CLUSTER 2 [LO 3] 6.3.4 Uses the vocabulary and properties of rotations, reflection and translation to describe relationships between distinct two-dimensional shapes and three-dimensional objects within patterns (including transformations and symmetry) 6.3.5 Draws enlargements and reductions of 2-dimensional shapes (at least quadrilaterals and triangles) using grid paper to compare their size and shape	MATHEMATICS LO 4: Measurement 6.4.1 Reads, tells and writes analogue, digital and 24-hour time to at least the nearest minute and second 6.4.11 Recognises and describe angles in two-dimensional shapes, three dimensional objects and the environment in terms of : • right angles angles greater than right angles	Symmetry (Rotations, Reflection and Translation) Draw enlargements and reductions of 2-D shapes.	Wall clock, mathematical sets, grid papers, mirror Pins, transparency, pair of scissors
4	CLUSTER 3 [LO3] 4.3.7 Describes changes in the view of an object held in different positions. 4.3.8 Locates position on a coded (labelled) grid including : • Maps from given instructions; • Column and row.	Social Sciences LO 1 Geographical Enquiry AS : Locates places using a simple grid referencing system and directions (works with sources)	Objects in different positions Locates position on a coded grid	Grid paper Models Maps

	CLUSTER 3 [LO 3]			

5	**5.3.7 Describes and sketches views of a simple three-dimensional object in different positions** **5.3.8 Locates position on a coded (labeled) grid including maps and traces a path between positions following verbal and written instructions.**	**<u>Social Science</u>** **LO 1 : Geographical Enquiry:-** **AS: uses an Index to find places on global atlas maps (Works with Sources)**	**Describe and sketch objects in different positions.** **Location of Positions in a coded grid.**	**Square grids** **Pencils** **Erasers** **Concrete objects** **Grid paper & Graph Papers** **Map**
6	**<u>CLUSTER 3 [LO 3]</u>** **6.3.6 Recognises and describes natural and cultural 2-D shapes and 3-D objects and patterns in terms of geometric shapes** **6.3.7 Draws and interprets sketches of 3-dimensional objects from different positions (perspectives)** **6.3.8 Locates positions on a coded grid , describes how to move between positions on the grid and recognises maps as grids**	**<u>Mathematics</u>** **6.4.6-Using appropriate measuring instruments (with understanding of their limitations) to appropriate levels of precision including :** • **rulers, metre sticks, tape measures and trundle wheels to measure length**	**Recognition and description of 2-D shapes and 3-D objects.** **Drawing of sketches of 3–D objects from different positions** **Location of positions on a grid.**	**Concrete objects.** **Graph & grid papers,** **Maths set of instruments** **Coded grid,** **graph paper and mathematical instruments set.**
4	**<u>LO 4</u>** **<u>MEASUREMENT</u>** **<u>CLUSTER 1 [LO 4]</u>** **4.4.1 Reads, tells and writes analogue , digital and 24-hour time to at least the nearest minute and second .** **4.4.2 Solves problems involving calculation and conversion between appropriate time units including seconds, minutes , hours, days, weeks, months**	**<u>Mathematics</u>** **LO 1: Number, operations and relationships.** **AS 2 : Describes and illustrates various ways of counting in different cultures .** **<u>Social Sciences</u>** **LO 1:** **Historical enquiry**	**Writing Analogue, digital and 24-hour time** **Units of time** **Calculations and conversions between units of time .** **Time measuring instruments.**	**Analogue Clock** **Digital watch** **Calendars**