

**PHASE  
LEARNING PROGRAMME**

**MATHEMATICS  
GRADE 8 – 9**

**PHASE  
LEARNING PROGRAMME**

**MATHEMATICS  
GRADE 8**

<b>GRADE 8</b>		<b>MODULE 1</b>	
<b>LEARNING OUTCOMES</b>		<b>ASSESSMENT STANDARDS</b>	
<p><b>LO 1</b></p> <p><b>NUMBERS, OPERATIONS AND RELATIONSHIPS</b></p> <p>The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.</p>		<p>1.1 describes and illustrates the historical and cultural development of numbers;</p> <p>1.2 recognises, classifies and represents the following numbers in order to describe and compare them:</p> <p style="padding-left: 20px;">1.2.3 numbers written in exponent form; including squares and cubes of natural numbers and their square roots and cube roots;</p> <p style="padding-left: 20px;">1.2.6 multiples and factors;</p> <p style="padding-left: 20px;">1.2.7 irrational numbers in the context of measurement (e.g. square and cube roots on non-perfect squares and cubes);</p> <p>1.6 estimates and calculates by selecting suitable steps for solving problems that involve the following:</p> <p style="padding-left: 20px;">1.6.2 multiple steps with rational numbers (including division with fractions and decimals);</p> <p style="padding-left: 20px;">1.6.3 exponents.</p>	
<p><b>LO 2</b></p> <p><b>PATTERNS FUNCTIONS AND ALGEBRA</b></p> <p>The learner will be able to recognise, describe and represent patterns and relationships, as well as to solve problems, using algebraic language and skills.</p>		<p>2.1 investigates and extends numerical and geometrical patterns to find relationships and rules, including patterns that:</p> <p style="padding-left: 20px;">2.1.1 are presented in physical or diagrammatic form;</p> <p style="padding-left: 20px;">2.1.2 are not limited to series with constant difference or ratio;</p> <p style="padding-left: 20px;">2.1.3 occur in natural and cultural contexts;</p> <p style="padding-left: 20px;">2.1.4 are created by the learner him/herself;</p> <p style="padding-left: 20px;">2.1.5 are presented in tables;</p> <p style="padding-left: 20px;">2.1.6 are presented algebraically;</p> <p>2.3 represents and uses relationships between variables to determine input and output values in a variety of ways by making use of:</p> <p style="padding-left: 20px;">2.3.1 verbal descriptions;</p> <p style="padding-left: 20px;">2.3.2 flow diagrams;</p> <p style="padding-left: 20px;">2.3.3 tables;</p> <p style="padding-left: 20px;">2.3.4 formulas and equations;</p> <p>2.4 builds mathematical models that represent, describe and provide solutions to problem situations, thereby revealing responsibility towards the environment and the health of other people (including problems in the contexts of human rights, social, economic, cultural and environmental issues);</p>	

<b>GRADE 8</b>		<b>MODULE 1</b>	
<b>LEARNING OUTCOMES</b>		<b>ASSESSMENT STANDARDS</b>	
		2.7	is able to determine, analyse and interpret the equivalence of different descriptions of the same relationship or rule which can be represented: 2.7.1 verbally; 2.7.2 by means of flow diagrams; 2.7.3 in tables; 2.7.4 by means of equations or expressions to thereby select the most practical representation of a given situation;
		2.8	is able to use conventions of algebraic notation and the variable, reconcilable and distributive laws to: 2.8.1 classify terms like even and odd and to account for the classification; 2.8.2 assemble equal terms; 2.8.3 multiply or divide an algebraic expression with one, two, or three terms by a monomial; 2.8.4 simplify algebraic expressions in bracketed notation using one or two sets of brackets and two types of operation; 2.8.5 compare different versions of algebraic expressions having one or two operations, select those that are equivalent and motivate the selected examples; 2.8.6 rewrite algebraic expressions, formulas or equations in context in simpler or more usable form;
		2.9	is able to interpret and use the following algebraic ideas in context: term, expression, coefficient, exponent (or index), basis, constant, variable, equation, formula (or rule).

<b>GRADE 8</b>		<b>MODULE 2</b>	
<b>LEARNING OUTCOMES</b>		<b>ASSESSMENT STANDARDS</b>	
<b>LO 1</b> <b>NUMBERS, OPERATIONS AND RELATIONSHIPS</b>	<p>The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.</p>	<p>1.2 recognises, classifies and represents the following numbers in order to describe and compare them:</p> <p style="margin-left: 20px;">1.2.1 integers;</p> <p style="margin-left: 20px;">1.2.5 additive and multiplicative inverses;</p> <p>1.7 uses a range of techniques to perform calculations including:</p> <p style="margin-left: 20px;">1.7.1 using the commutative, associative and distributive properties with rational numbers;</p> <p style="margin-left: 20px;">1.7.2 using a calculator;</p> <p>1.8 uses a range of strategies to check solutions and judges the reasonableness of solutions.</p>	
<b>LO 2</b> <b>PATTERNS, FUNCTIONS AND ALGEBRA</b>	<p>The learner will be able to recognise, describe and represent patterns and relationships, as well as to solve problems, using algebraic language and skills.</p>	<p>2.5 solves equations by inspection, trial-and-improvement or algebraic processes (additive and multiplicative inverses), checking the solution by substitution;</p> <p>2.8 is able to use conventions of algebraic notation and the variable, reconcilable and distributive laws to: is able to use conventions of algebraic notation and the variable, reconcilable and distributive laws to:</p> <p style="margin-left: 20px;">2.8.4 simplify algebraic expressions in bracketed notation using one or two sets of brackets and two types of operation;</p> <p style="margin-left: 20px;">2.8.6 rewrite algebraic expressions, formulas or equations in context in simpler or more usable form.</p>	
<b>LO 3</b> <b>SPACE AND SHAPE (GEOMETRY)</b>	<p>The learner will be able to describe and represent characteristics and relationships between two-dimensional shapes and three-dimensional objects in a variety of orientations and positions.</p>	<p>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:</p> <p style="margin-left: 20px;">3.2.1 sides, angles and diagonals and their interrelationships, with focus on triangles and quadrilaterals (e.g. types of triangles and quadrilaterals).</p>	
<b>LO 4</b> <b>MEASUREMENT</b>	<p>The learner will be able to use appropriate measuring units, instruments and formulae in a variety of contexts.</p>	<p>4.7 estimates, compares, measures and draws angles accurate to one degree using protractors.</p>	

<b>GRADE 8</b>		<b>MODULE 3</b>	
<b>LEARNING OUTCOMES</b>		<b>ASSESSMENT STANDARDS</b>	
<p style="text-align: center;"><b>LO 1</b></p> <p style="text-align: center;"><b>NUMBERS, OPERATIONS AND RELATIONSHIPS</b></p> <p>The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.</p>	<p>1.2 recognises, classifies and represents the following numbers to describe and compare them:</p> <p style="margin-left: 20px;">1.2.2 decimals, fractions and percentages;</p> <p style="margin-left: 20px;">1.2.5 additive and multiplicative inverses;</p> <p style="margin-left: 20px;">1.2.6 multiples and factors;</p> <p style="margin-left: 20px;">1.2.7 irrational numbers in the context of measurement (e.g. <math>\pi</math> and square and cube roots of non-perfect squares and cubes);</p> <p>1.3 recognises and uses equivalent forms of the rational numbers listed above;</p> <p>1.6 estimates and calculates by selecting and using operations appropriate to solving problems that involve:</p> <p style="margin-left: 20px;">1.6.1 rounding off;</p> <p style="margin-left: 20px;">1.6.2 multiple operations with rational numbers (including division with fractions and decimals);</p> <p>1.7 uses a range of techniques to perform calculations, including:</p> <p style="margin-left: 20px;">1.7.1 using the commutative, associative and distributive properties with rational numbers;</p> <p style="margin-left: 20px;">1.7.2 using a calculator;</p> <p>1.9 recognises, describes and uses:</p> <p style="margin-left: 20px;">1.9.1 algorithms for finding equivalent fractions;</p> <p style="margin-left: 20px;">1.9.2 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 the properties).</p>		
<p style="text-align: center;"><b>LO 3</b></p> <p style="text-align: center;"><b>SPACE AND SHAPE (GEOMETRY)</b></p> <p>The learner will be able to describe and represent characteristics and relationships between two-dimensional shapes and three-dimensional objects in a variety of orientations and positions.</p>	<p>3.2 in context 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:</p> <p style="margin-left: 20px;">3.2.1 sides, angles and diagonals and their interrelationships, with focus on triangles and quadrilaterals (e.g. types of triangles and quadrilaterals).</p>		

GRADE 8		MODULE 3
LEARNING OUTCOMES	ASSESSMENT STANDARDS	
<p><b>LO 4</b></p> <p><b>MEASUREMENT</b></p> <p>The learner will be able to use appropriate measuring units, instruments and formulae in a variety of contexts.</p>	<p>4.2 solves problems involving:</p> <p>4.2.1 length;</p> <p>4.2.2 perimeter and area of polygonals and circles;</p> <p>4.3 solves problems using a range of strategies including:</p> <p>4.3.1 estimating;</p> <p>4.3.2 calculating to at least two decimal positions;</p> <p>4.3.3 using and converting between appropriate SI units;</p> <p>4.4 describes the meaning of and uses <math>\pi</math> in calculations involving circles and discusses its historical development in measurement;</p> <p>4.5 calculates, by selecting and using appropriate formulae:</p> <p>4.5.1 perimeter of polygons and circles;</p> <p>4.5.2 area of triangles, rectangles circles and polygons by decomposition into triangles and rectangles;</p> <p>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;</p> <p>4.9 uses the Theorem of Pythagoras to calculate a missing length in a right-angled triangle leaving irrational answers in surd form (<math>\sqrt{\quad}</math>);</p> <p>4.10 describes and illustrates ways of measuring in different cultures throughout history (e.g. determining right angles using knotted string leading to the Theorem of Pythagoras).</p>	

<b>GRADE 8</b>		<b>MODULE 4</b>	
<b>LEARNING OUTCOMES</b>		<b>ASSESSMENT STANDARDS</b>	
<p><b>LO 1</b></p> <p><b>NUMBERS, OPERATIONS AND RELATIONSHIPS</b></p> <p>The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.</p>		<p>1.4 solves problems in context, inclusive of contexts that can be used to promote awareness of other learning areas, and of human rights, social, economic and environmental issues, like:</p> <p>1.4.1 financial contexts (including profit and loss, budgets, accounts, loans, simple interest, hire purchase, rates of exchange);</p> <p>1.4.2 measuring in the context of the Natural Sciences and technology;</p> <p>1.5 solves problems dealing with ratio and rate.</p>	
<p><b>LO 3</b></p> <p><b>SPACE AND SHAPE (GEOMETRY)</b></p> <p>The learner will be able to describe and represent characteristics and relationships between two-dimensional shapes and three-dimensional objects in a variety of orientations and positions.</p>		<p>3.2 describes and classifies geometric figures and three-dimensional objects in terms of properties in contexts inclusive of those that can be used to promote awareness of social, cultural and environmental issues, including:</p> <p>3.2.1 sides, angles and diagonals and their relationships, focusing on triangles and quadrilaterals (e.g. types of triangles and quadrilaterals);</p> <p>3.3 uses vocabulary to describe parallel lines that are cut by a transverse, perpendicular or intersection line, as well as triangles, with reference to angular relationships (e.g. vertically opposite, corresponding);</p> <p>3.4 uses a pair of compasses, a ruler and a protractor for accurately constructing geometric figures so that specific properties may be investigated and nets may be designed;</p> <p>3.5 designs and uses nets to make models of geometric three-dimensional objects that have been studied in the preceding grades and up till now;</p> <p>3.7 uses proportion to describe the effect of expansion and reduction on the properties of geometric figures;</p> <p>3.8 draws and interprets sketches of geometric three-dimensional objects from several perspectives, focusing on the retention of properties.</p>	

GRADE 8		MODULE 4
LEARNING OUTCOMES	ASSESSMENT STANDARDS	
<p style="text-align: center;"><b>LO 4</b></p> <p style="text-align: center;"><b>MEASUREMENT</b></p> <p>The learner will be able to use appropriate measuring units, instruments and formulae in a variety of contexts.</p>	<p>4.1 solves more complicated problems involving time, inclusive of the ratio between time, distance and speed;</p> <p>4.2 solves problems involving the following:</p> <p style="padding-left: 20px;">4.2.1 length;</p> <p style="padding-left: 20px;">4.2.2 circumference and area of polygons and circles;</p> <p style="padding-left: 20px;">4.2.3 volume and exterior area of rectangular prisms and cylinders;</p> <p>4.3 solves problems using a variety of strategies, including:</p> <p style="padding-left: 20px;">4.3.1 estimation;</p> <p style="padding-left: 20px;">4.3.2 calculation to at least two decimal points;</p> <p style="padding-left: 20px;">4.3.3 use and converting between appropriate S.I. units;</p> <p>4.5 calculates the following with the use of appropriate formulas:</p> <p style="padding-left: 20px;">4.5.1 circumference of polygons and circles;</p> <p style="padding-left: 20px;">4.5.2 area of triangles, right angles and polygons by means of splitting up to triangles and right angles;</p> <p style="padding-left: 20px;">4.5.3 volume of prisms with triangular and rectangular bases and cylinders;</p> <p>4.7 estimates, compares, measures and draws triangles accurately to within one degree.</p>	

**PHASE  
LEARNING PROGRAMME**

**MATHEMATICS  
GRADE 9**

GRADE 9		MODULE 1
LEARNING OUTCOMES	ASSESSMENT STANDARDS	
<p style="text-align: center;"><b>LO 1</b></p> <p style="text-align: center;"><b>NUMBERS, OPERATIONS AND RELATIONSHIPS</b></p> <p>The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.</p>	<p>1.1 describes and illustrates the historical development of number systems in a variety of historical and cultural contexts (including local);</p> <p>1.2 recognises, uses and represents rational numbers (including very small numbers written in scientific notation), moving flexibly between equivalent forms in appropriate contexts;</p> <p>1.3 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:</p> <p>1.3.1 financial (including profit and loss, budgets, accounts, loans, simple and compound interest, hire purchase, exchange rates, commission, rentals and banking);</p> <p>1.3.2 measurements in Natural Sciences and Technology contexts;</p> <p>1.4 solves problems that involve ratio, rate and proportion (direct and indirect);</p> <p>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);</p> <p>1.6 uses a range of techniques and tools (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):</p> <p>1.6.1 <math>x^n \times x^m = x^{n+m}</math></p> <p>1.6.2 <math>x^n \div x^m = x^{n-m}</math></p> <p>1.6.3 <math>x^0 = 1</math></p> <p>1.6.4 <math>x^{-n} = \frac{1}{x^n}</math></p> <p>1.7 recognises, describes and uses the properties of rational numbers.</p>	

<b>GRADE 9</b>		<b>MODULE 1</b>	
<b>LEARNING OUTCOMES</b>		<b>ASSESSMENT STANDARDS</b>	
<p><b>LO 2</b></p> <p><b>PATTERNS, FUNCTIONS AND ALGEBRA</b></p> <p>The learner will be able to recognise, describe and represent patterns and relationships, as well as to solve problems, using algebraic language and skills.</p>		<p>2.8 uses the laws of exponents to simplify expressions and solve equations.</p>	
<p><b>LO 4</b></p> <p><b>MEASUREMENT</b></p> <p>The learner will be able to use appropriate measuring units, instruments and formulae in a variety of contexts.</p>		<p>4.1 solves ratio and rate problems involving time, distance and speed;</p> <p>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:</p> <p style="padding-left: 20px;">4.2.1 measuring precisely and selecting measuring instruments appropriate to the problem;</p> <p style="padding-left: 20px;">4.2.2 estimating and calculating with precision;</p> <p style="padding-left: 20px;">4.2.3 selecting and using appropriate formulae and measurements;</p> <p>4.3 describes and illustrates the development of measuring instruments and conventions in different cultures throughout history;</p> <p>4.4 uses the Theorem of Pythagoras to solve problems involving missing lengths in known geometric figures and solids.</p>	

GRADE 9		MODULE 2
LEARNING OUTCOMES	ASSESSMENT STANDARDS	
<p style="text-align: center;"><b>LO 1</b></p> <p style="text-align: center;"><b>NUMBERS, OPERATIONS AND RELATIONSHIPS</b></p> <p>The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.</p>	<p>1.1 describes and illustrates the historical development of number systems in a variety of historical and cultural contexts (including local);</p> <p>1.2 recognises, uses and represents rational numbers (including very small numbers written in scientific notation), moving flexibly between equivalent forms in appropriate contexts;</p> <p>1.3 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:</p> <p>1.3.1 financial (including profit and loss, budgets, accounts, loans, simple and compound interest, hire purchase, exchange rates, commission, rentals and banking);</p> <p>1.3.2 measurements in Natural Sciences and Technology contexts;</p> <p>1.4 solves problems that involve ratio, rate and proportion (direct and indirect);</p> <p>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);</p> <p>1.6 uses a range of techniques and tools (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):</p> <p>1.6.1 <math>x^n \times x^m = x^{n+m}</math></p> <p>1.6.2 <math>x^n \div x^m = x^{n-m}</math></p> <p>1.6.5 <math>x^0 = 1</math></p> <p>1.6.6 <math>x^{-n} = \frac{1}{x^n}</math></p> <p>1.7 recognises, describes and uses the properties of rational numbers.</p>	

GRADE 9		MODULE 2
LEARNING OUTCOMES	ASSESSMENT STANDARDS	
<p style="text-align: center;"><b>LO 2</b> <b>PATTERNS, FUNCTIONS AND ALGEBRA</b></p> <p>The learner will be able to recognise, describe and represent patterns and relationships, as well as to solve problems, using algebraic language and skills.</p>	<p>2.1 investigates, in different ways, a variety of numeric and geometric patterns and relationships by representing and generalising them, and by explaining and justifying the rules that generate them (including patterns found in natural and cultural forms and patterns of the learner's own creation);</p> <p>2.7 uses the distributive law and manipulative skills developed in Grade 8 to:</p> <p style="padding-left: 20px;">2.7.1 find the product of two binomials;</p> <p style="padding-left: 20px;">2.7.2 factorise algebraic expressions (limited to common factors and difference of squares).</p> <p>2.8 uses the laws of exponents to simplify expressions and solve equations;</p> <p>2.9 uses factorisation to simplify algebraic expressions and solve equations.</p>	
<p style="text-align: center;"><b>LO 3</b> <b>SPACE AND SHAPE (GEOMETRY)</b></p> <p>The learner will be able to describe and represent characteristics and relationships between two-dimensional shapes and three-dimensional objects in a variety of orientations and positions.</p>	<p>3.1 recognises, visualises and names geometric figures and solids in natural and cultural forms and geometric settings, including:</p> <p style="padding-left: 20px;">3.1.1 regular and irregular polygons and polyhedra;</p> <p style="padding-left: 20px;">3.1.2 spheres;</p> <p style="padding-left: 20px;">3.1.3 cylinders;</p> <p>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:</p> <p style="padding-left: 20px;">3.2.1 congruence and straight line geometry;</p> <p>3.3 uses geometry of straight lines and triangles to solve problems and to justify relationships in geometric figures;</p> <p>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;</p> <p>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.</p>	

<p style="text-align: center;"><b>LO 4</b> <b>MEASUREMENT</b></p> <p>The learner will be able to use appropriate measuring units, instruments and formulae in a variety of contexts.</p>	<p>4.1 solves ratio and rate problems involving time, distance and speed;</p> <p>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:</p> <p style="padding-left: 20px;">4.2.1 measuring precisely and selecting measuring instruments appropriate to the problem;</p> <p style="padding-left: 20px;">4.2.4 estimating and calculating with precision;</p> <p style="padding-left: 20px;">4.2.5 selecting and using appropriate formulae and measurements;</p> <p>4.3 describes and illustrates the development of measuring instruments and conventions in different cultures throughout history;</p> <p>4.4 uses the Theorem of Pythagoras to solve problems involving missing lengths in known geometric figures and solids.</p>
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<b>GRADE 9</b>		<b>MODULE 3</b>	
<b>LEARNING OUTCOMES</b>		<b>ASSESSMENT STANDARDS</b>	
<p style="text-align: center;"><b>LO 1</b></p> <p style="text-align: center;"><b>NUMBERS, OPERATIONS AND RELATIONSHIPS</b></p> <p>The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.</p>	<p>1.2 recognises, uses and represents rational numbers (including very small numbers written in scientific notation), moving flexibly between equivalent forms in appropriate contexts;</p> <p>1.3 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:</p> <p style="padding-left: 20px;">1.3.1 financial (including profit and loss, budgets, accounts, loans, simple and compound interest, hire purchase, exchange rates, commission, rentals and banking);</p> <p style="padding-left: 20px;">1.3.2 measurements in Natural Sciences and Technology contexts;</p> <p>1.4 solves problems that involve ratio, rate and proportion (direct and indirect);</p> <p>1.7 recognises, describes and uses the properties of rational numbers.</p>		
<p style="text-align: center;"><b>LO 2</b></p> <p style="text-align: center;"><b>PATTERNS, FUNCTIONS AND ALGEBRA</b></p> <p>The learner will be able to recognise, describe and represent patterns and relationships, as well as to solve problems, using algebraic language and skills.</p>	<p>2.1 investigates, in different ways, a variety of numeric and geometric patterns and relationships by representing and generalising them, and by explaining and justifying the rules that generate them (including patterns found in nature and cultural forms and patterns of the learner's own creation);</p> <p>2.2 represents and uses relationships between variables in order to determine input and/or output values in a variety of ways using:</p> <p style="padding-left: 20px;">2.2.1 verbal descriptions;</p> <p style="padding-left: 20px;">2.2.2 flow diagrams;</p> <p style="padding-left: 20px;">2.2.3 tables;</p> <p style="padding-left: 20px;">2.2.4 formulae and equations;</p> <p>2.3 constructs mathematical models that represent, describe and provide solutions to problem situations, showing responsibility toward the environment and health of others (including problems within human rights, social, economic, cultural and environmental contexts);</p> <p>2.4 solves equations by inspection, trial-and-improvement or algebraic processes (additive and multiplicative inverses, and factorisation), checking the solution by substitution;</p>		

<b>GRADE 9</b>		<b>MODULE 3</b>	
<b>LEARNING OUTCOMES</b>		<b>ASSESSMENT STANDARDS</b>	
		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;
		2.6	determines, analyses and interprets the equivalence of different descriptions of the same relationship or rule presented:
		2.6.1	verbally;
		2.6.2	in flow diagrams;
		2.6.3	in tables;
		2.6.4	by equations or expressions;
		2.6.5	by graphs on the Cartesian plane in order to select the most useful representation for a given situation;
		2.9	uses factorisation to simplify algebraic expressions and solve equations.
<b>LO 3</b>			
<b>SPACE AND SHAPE (GEOMETRY)</b>			
The learner will be able to describe and represent characteristics and relationships between two-dimensional shapes and three-dimensional objects in a variety of orientations and positions.		3.7	uses various representational systems to describe position and movement between positions, including:
		3.7.1	ordered grids;
		3.7.2	Cartesian plane (4 quadrants)
		3.7.3	compass directions in degrees;
		3.7.4	angles of elevation and depression.
<b>LO 4</b>			
<b>MEASUREMENT</b>			
The learner will be able to use appropriate measuring units, instruments and formulae in a variety of contexts.		4.1	solves ratio and rate problems involving time, distance and speed;
		4.4	uses the theorem of Pythagoras to solve problems involving missing lengths in known geometric figures and solids.
<b>LO 5</b>			
<b>DATA HANDLING</b>			
The learner will be able to collect, summarise, display and critically analyse data in order to draw conclusions and make predictions and to interpret and determine chance variation.		5.1	poses questions relating to human rights, social, economic, environmental and political issues in South Africa;
		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;
		5.3	organises numerical data in different ways in order to summarise by determining:
		5.3.1	measures of central tendency;
		5.3.2	measures of dispersion;

<b>GRADE 9</b>		<b>MODULE 3</b>	
<b>LEARNING OUTCOMES</b>		<b>ASSESSMENT STANDARDS</b>	
		5.4	draws a variety of graphs by hand/technology to display and interpret data including:
		5.4.1	bar graphs and double bar graphs;
		5.4.2	histograms with given and own intervals;
		5.4.3	pie charts;
		5.4.4	line and broken–line graphs;
		5.4.5	scatter plots;
		5.5	critically reads and interprets data with awareness of sources of error and manipulation to draw conclusions and make predictions about:
		5.5.1	social, environmental and political issues (e.g. crime, national expenditure, conservation, HIV/AIDS);
		5.5.2	characteristics of target groups (e.g. age, gender, race, socio–economic groups);
		5.5.3	attitudes or opinions of people on issues (e.g. smoking, tourism, sport);
		5.5.4	any other human rights and inclusivity issues;
		5.6	considers situations with equally probable outcomes, and:
		5.6.1	determines probabilities for compound events using two-way tables and tree diagrams;
		5.6.2	determines the probabilities for outcomes of events and predicts their relative frequency in simple experiments;
		5.6.3	discusses the differences between the probability of outcomes and their relative frequency.

<b>GRADE 9</b>		<b>MODULE 4</b>	
<b>LEARNING OUTCOMES</b>		<b>ASSESSMENT STANDARDS</b>	
<p style="text-align: center;"><b>LO 1</b></p> <p style="text-align: center;"><b>NUMBERS, OPERATIONS AND RELATIONSHIPS</b></p> <p>The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.</p>		<p>1.3 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:</p> <p>1.3.2 measurements in Natural Sciences and Technology contexts.</p>	
<p style="text-align: center;"><b>LO 3</b></p> <p style="text-align: center;"><b>SPACE AND SHAPE (GEOMETRY)</b></p> <p>The learner will be able to describe and represent characteristics and relationships between two-dimensional shapes and three-dimensional objects in a variety of orientations and positions.</p>		<p>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:</p> <p>3.2.1 transformations;</p> <p>3.3 uses geometry of straight lines and triangles to solve problems and to justify relationships in geometric figures;</p> <p>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;</p> <p>3.6 recognises and describes geometric solids in terms of perspective, including simple perspective drawing;</p> <p>3.7 uses various representational systems to describe position and movement between positions, including:</p> <p>3.7.1 ordered grids.</p>	
<p style="text-align: center;"><b>LO 4</b></p> <p style="text-align: center;"><b>MEASUREMENT</b></p> <p>The learner will be able to use appropriate measuring units, instruments and formulae in a variety of contexts.</p>		<p>4.4 uses the theorem of Pythagoras to solve problems involving missing lengths in known geometric figures and solids.</p>	