Senior Preparatory Mathematics
Scope and Skills Document

These are the minimum requirements laid down in the RNCS.
Each grade should revise and build on the work from the previous grades.

Grade 4	Grade 5	Grade 6	Grade 7
Learning Outcome 1	**Learning Outcome 1**	**Learning Outcome 1**	**Learning Outcome 1**
Tables 0 x table to 12 x table	Tables 0 x table to 12 x table	Tables 0 x table to 12 x table	Tables 0 x table to 12 x table
Counting Count forward and backwards in 2s, 3s 5s,10s25s,50s,100s and others between 0 and at least 10 000 Odd and even numbers Doubling and Halving	Counting Count forward and backwards in to 1 000 000 and in fractions up to $\frac{1}{12}$ s Doubling and halving	Counting Count forward and backwards in decimal fractions up to three decimal places	Counting Count forward and backwards in decimal fractions up to 3 decimal places and in integers, crossing zero.
Place Value and Expanded Notation Up to 4 digit whole numbers	Place Value and Expanded Notation Up to 6 digit whole numbers	Place Value and Expanded Notation Up to 9 digit whole numbers and decimals to three decimal places.	Place Value and Expanded Notation Revision of work covered in previous grades.
Factors and Multiplies Multiples of 1 to 9 up to 100	Factors and Multiplies Multiples of 1 to 9 up to 100 Factors of numbers up to 99	Factors and Multiplies Factors and multiples up to 99. Prime numbers to 100 Divisibility rules for2, 5, 10, 100 and 1 000	Factors and Multiplies Factors and prime factors up to 999 Squares of whole numbers to 12^2 Cubes of whole numbers to 5^3 Square roots and cubed roots of the above
Estimation Rounding off to the nearest 10, 100 or 1 000	Estimation Rounding off to the nearest 5, 10, 100 or 1 000 Compensating	Estimation Rounding off to the nearest 5, 10, 100 or 1 000	Estimation Rounding off to at least one decimal place
Basic Operations NO ALGORITHMS Addition and subtraction of at least 4 digit numbers. Multiplication of at least 2 digit by 2 digit numbers Division of at least 3 digit by 1 digit numbers with remainders Reasonableness of solutions Reciprocal relationship between addition and subtraction and multiplication and division	Basic Operations NO ALGORITHMS Addition and subtraction of at least 5 digit numbers. Multiplication of at least 3 digit by 2 digit numbers Division of at least 3 digit by 2 digit numbers with remainders 0 as an additive inverse 1 as a multiplicative inverse Reasonableness of solutions Reciprocal relationship between addition and subtraction and multiplication and division	Basic Operations INTRODUCE ALGORITHMS Addition and subtraction of at least 4 digit numbers. Multiplication of at least 4 digit by 3 digit numbers Division of at least 4 digit by 3 digit numbers with remainders 0 as an additive inverse 1 as a multiplicative inverse Reasonableness of solutions Reciprocal relationship between addition and subtraction and multiplication and division Multiple operations with and without brackets	Basic Operations ALGORITHMS ONLY Revision of work covered in previous grades.
Decimal Fractions Using measurement to recognise 0,5; 1,5; 2,5; etc	Decimal Fractions Using measurement to recognise 0,5; 1,5; 2,5; etc Addition and subtraction to I decimal place Converting 0,5; 0,2; 0,25 etc to common fractions	Decimal Fractions Decimal fractions to hundredths Addition and subtraction to 2 decimal places	Decimal Fractions Decimal fractions up to at least three decimal places Addition and subtraction Multiplying and dividing by multiples of 10 Multiplying and dividing a decimal fraction by a decimal fraction Converting decimal fractions to common fractions and percentages Problem solving

		Percentage	Percentage
		Percentage of a whole number	Percentage of a whole number
			Finding 100% if a percentage of the whole is known
			Profit and loss
			Converting percentages to common and decimal fractions
Ratio and Rate	Ratio and Rate	Ratio and Rate	Ratio and Rate
Comparing 2 quantities of the same kind (ratio)	Comparing 2 quantities of the same kind (ratio)	Comparing 2 quantities of the same kind (ratio)	Calculating the parts of a quantity
Comparing 2 quantities of different kinds e.g. kg/R	Comparing 2 quantities of different kinds e.g. teachers/learners	Comparing 2 quantities of different kinds e.g. wages/days	Calculating the total quantity if only a part is known
			Problem solving
Calculator Skills	Calculator Skills	Calculator Skills	Calculator Skills
Using a calculator	Using a calculator	Using a calculator	Using a calculator
			Memory Function
			Constant function

Learning Outcome 2	**Learning Outcome 2**	**Learning Outcome 2**	**Learning Outcome 2**
Number Patterns and Variables	Number Patterns and Variables	Number Patterns and Variables	Number Patterns and Variables
Relationships and rules for numeric and geometric patterns in physical or diagrammatic form, with and without constant ratios or of their own creation.	Relationships and rules for numeric and geometric patterns in physical or diagrammatic form, with and without constant ratios or of their own creation.	Relationships and rules for numeric and geometric patterns in physical or diagrammatic form, with and without constant ratios or of their own creation.	Relationships and rules for numeric and geometric patterns in physical or diagrammatic form, with and without constant ratios or of their own creation or in tables
Describe relationships or rules in own words	Describe relationships or rules in own words	Number patterns in tables	Describe relationships or rules in own words
Input and output values in flow diagrams	Input and output values in flow diagrams	Describe relationships or rules in own words	Input and output values in verbal descriptions, flow diagrams and tables
Writing, solving and completing open number sentences by trial and improvement or inspection to describe a problem	Writing, solving and completing open number sentences by trial and improvement or inspection to describe a problem	Input and output values in flow diagrams, number sentences and tables	Construct mathematical models to represent, describe and provide solutions to problem situations
Checking the answer by substitution	Compare equivalence of different descriptions of relationships and rules presented verbally, in flow diagrams and number sentences	Writing, solving and completing open number sentences by trial and improvement or inspection to describe a problem	Solve or complete number sentences by inspection or by trial and improvement
	Checking the answer by substitution	Compare equivalence of different descriptions of relationships and rules presented verbally, in flow diagrams, number sentences and tables	Check answers by substitution
		Checking the answer by substitution	Describe a graph by interpretation
			Draw a graph from a description of a situation

Learning Outcome 3	**Learning Outcome 3**	**Learning Outcome 3**	**Learning Outcome**
2-D Shapes and 3-D Objects	2-D Shapes and 3-D Objects	2-D Shapes and 3-D Objects	2-D Shapes and 3-D Objects
Recognise, visualise and name rectangular prisms, spheres, cylinders, prisms, pyramids, circles and rectangles.	Similarities between cubes and rectangular prisms and squares and rectangles	Similarities and differences between tetrahedrons and pyramids and rectangles and parallelograms	Similarities and differences between different polyhedra
Faces, sides, flat and curved surfaces, straight and curved sides.	Describe, sort and compare 2-D shapes and 3-D objects according to shape and number of sides (geometric properties)	Describe, sort and compare 2-D shapes and 3-D objects according to faces, vertices, edges, length of sides and size of angles (geometric properties)	Similarities and differences between quadrilaterals including kites and trapeziums
Construct models and draw shapes on grid paper.	Construct models and draw above shapes on grid paper	Models using straws and nets	Describe, sort and compare 2-D shapes and 3-D objects according to faces, vertices, edges, sides and angles, parallel and perpendicular lines
	Nets of above shapes	Draw above shapes on grid paper	Construction and investigation of the properties of nets
		Draw circles and circle patterns	Rotation, reflection and translation
		Enlarge and reduce quadrilaterals and triangles on grid paper to compare size and shape	Similar and congruent figures
			Draw solids from different perspectives
Symmetry	Symmetry	Symmetry	Symmetry
Draw lines of symmetry	Line symmetry		Line symmetry and rotational symmetry
	Rotational symmetry		
Tessellation	Tessellation	Tessellation	Tessellation
Pattern making from geometric shapes	Pattern making from geometric shapes		

Position	Position	Position	Position
Describe a 2-D object viewed form different positions Position on a grid from given instructions Columns and rows	Rotation, reflection and translation Describe a 2-D object viewed form different positions Find a position on a grid from given instructions Trace the path between two positions	Describe a3-D shape viewed form different positions Move between position on a grid from given instructions Maps as grids	Locate a position on a grid by plotting co-ordinates or compass direction
Learning Outcome 4	**Learning Outcome 4**	**Learning Outcome 4**	**Learning Outcome 4**
Time	Time	Time	Time
Read, write and tell analogue and digital time to the nearest minute and second Calculate and convert between seconds, minutes, hours, days, weeks, months and years	Read, write and tell analogue and digital time to the nearest minute and second Calculate and convert between seconds, minutes, hours, days, weeks, months, years, decades, centuries and millennia	Read, write and tell analogue and digital time to the nearest minute and second Calculate and convert between time zones and differences	Relationship between distance, speed and time
Length, Mass and Capacity	Length, Mass and Capacity	Length, Mass and Capacity	Length, Mass and Capacity
Measure accurately with scales, balances, measuring jugs, rulers, metre sticks, tape measures and trundle wheels Estimate, measure, record and compare 2-D objects and 3-D shapes using kg and g; *l* and m*l* and km, m, cm and m	Measure accurately with scales, balances, measuring jugs, rulers, metre sticks, tape measures, trundle wheels and thermometers Estimate, measure, record and compare 2-D objects and 3-D shapes using kg and g; *l* and m*l* and km, m, cm and m; degrees Celsius	Measure accurately with scales, balances, measuring jugs, rulers, metre sticks, tape measures, trundle wheels and thermometers Estimate, measure, record and compare 2-D objects and 3-D shapes using kg and g; *l* and m*l* and km, m, cm and m; degrees Celsius	Problem solving Estimating, calculating to at least 2 decimal places and converting between appropriate SI units
Perimeter, Area and Volume	Perimeter, Area and Volume	Perimeter, Area and Volume	Perimeter, Area and Volume
Perimeter, using rulers and tape measures Area using square grids and tiling Volume/Capacity using blocks	Perimeter, using rulers and tape measures Area using square grids and tiling Volume/Capacity using blocks	Perimeter, using rulers and tape measures Area of squares and rectangles using square grids Volume/Capacity of regular prisms using blocks Developing rules to calculate perimeter, area and volume Relationship between surface area, volume and dimensions of rectangular prisms	Perimeter and area of regular and irregular polygons Area of triangles, rectangles and squares Volume and surface area of triangular and rectangular based prisms Interrelationship between perimeter and area; surface area and volume
		Lines and Angles	Lines and Angles
		Acute, right and obtuse angles	Acute, right, straight, obtuse and reflex angles Revolution Draw and measure angles correct to one degree.
Learning Outcome 5	**Learning Outcome 5**	**Learning Outcome 5**	**Learning Outcome 5**
Collecting, organising and interpreting data	Collecting, organising and interpreting data	Collecting, organising and interpreting data	Collecting, organising and interpreting data
Questionnaires to collect data Tallies and data to record data Interpret data and draw conclusions	Questionnaires to collect data Tallies and data to record data Interpret data and draw conclusions Mode	Questionnaires to collect data Tallies and data to record data Interpret data and draw conclusions Mode and median Samples and population	Questionnaires to collect data Appropriate sources for collecting data Samples and population Tallies tables and stem and leaf displays to record data Mean, mode and median Range Interpret data and draw conclusions
Drawing Graphs	Drawing Graphs	Drawing Graphs	Drawing Graphs
Pictographs Bar graphs	Pictographs with key Bar graphs	Pictographs with key Bar and double bar graphs	Bar graphs, double bar graphs, histograms, pie charts and line and broken line graphs
Possibility and Chance	Possibility and Chance	Possibility and Chance	Possibility and Chance
Certainty or uncertainty of events Outcomes of simple trials	Certainty or uncertainty of events Outcomes of simple trials	Certainty or uncertainty of events Outcomes of simple trials Count the frequency of actual outcomes	Possible outcomes based on condition of activity Frequency of outcomes Relative frequency