



# NumberSense

Mathematics Programme

## Curriculum

Grades 4 – 7

(May 2023)



## Number, Operations and Relationships

	Grade 4	Grade 5	Grade 6	Grade 7		
Numbers	Rote counting	<ul style="list-style-type: none"> <li>Rote counts forwards and backwards in:                             <ul style="list-style-type: none"> <li>a variety of intervals (including 2s, 5s, 10s, 20s, 25s, 50s, and 100s, 200s, 250s, 500s) between 0 and at least 10000</li> <li>fractions (including <math>\frac{1}{2}</math>; <math>\frac{1}{3}</math>; <math>\frac{1}{4}</math>; <math>\frac{1}{5}</math>; <math>\frac{1}{10}</math>; <math>1\frac{1}{2}</math>)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Counts forwards and backwards in whole number intervals and fractions</li> </ul>	<ul style="list-style-type: none"> <li>Counts forwards and backwards in decimal fractions</li> </ul>	<ul style="list-style-type: none"> <li>Counts forwards and backwards in the following ways:                             <ul style="list-style-type: none"> <li>in decimal fraction intervals</li> <li>in integers for any intervals</li> </ul> </li> </ul>	
	Reading & writing numbers	<ul style="list-style-type: none"> <li>Reads and writes whole numbers</li> <li>Reads and writes fractions using words and fraction notation</li> <li>Reads and writes decimal fractions in the context of measurement</li> <li>Round off whole numbers to nearest 10, 100 and 1 000</li> </ul>	<ul style="list-style-type: none"> <li>Round off whole numbers to nearest 5, 10, 100 and 1 000</li> </ul>	<ul style="list-style-type: none"> <li>Round off whole numbers to nearest 5, 10, 100 and 1 000</li> </ul>	<ul style="list-style-type: none"> <li>Round off numbers to at least 1 decimal place</li> </ul>	
	Ordering and comparing	<ul style="list-style-type: none"> <li>Recognises the following numbers in order to describe and compare them:                             <ul style="list-style-type: none"> <li>positive whole numbers beyond 1000</li> <li>positive unitary and non-unitary fractions in the context of problems</li> <li>positive decimal fractions in the context of measurement</li> <li>positive odd and even numbers</li> <li>multiples of single-digit whole numbers to at least 100</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Recognises the following numbers in order to describe and compare them:                             <ul style="list-style-type: none"> <li>positive whole numbers</li> <li>positive unitary and non-unitary fractions</li> <li>positive decimal fractions in the context of measurement</li> <li>positive odd and even numbers</li> <li>multiples of single-digit whole numbers to at least 100</li> <li>factors of 1- and 2-digit whole numbers</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Recognises the following numbers in order to describe and compare them:                             <ul style="list-style-type: none"> <li>positive whole numbers</li> <li>positive unitary and non-unitary fractions</li> <li>positive decimal fractions (to at least 2 decimal places)</li> <li>multiples and factors of 1-, 2- and 3-digit whole numbers</li> <li>prime numbers to at least 100</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Recognises the following numbers in order to describe and compare them:                             <ul style="list-style-type: none"> <li>integers</li> <li>positive unitary and non-unitary fractions</li> <li>decimal fractions (to at least 3 decimal places)</li> <li>factors including prime factors of 3-digit whole numbers</li> <li>numbers in exponential form</li> </ul> </li> </ul>	
	Place value	<ul style="list-style-type: none"> <li>Recognises the place value of digits in whole numbers to at least 4-digit numbers by partitioning and recombining using multiples of 1 000, 100, 10 and 1 (e.g. <math>6\ 325 = 6\ 000 + 300 + 20 + 5</math>; <math>6\ 325 = 6\ 000 + 325</math>; <math>6\ 325 = 6\ 300 + 25</math> ...)</li> <li>Recognises the place value of digits in decimal fractions (in the context of measurement) to at least 1-decimal place by partitioning and recombining using multiples of 10, 1 and tenths (e.g. <math>63.2 = 60 + 3 + 2\text{-tenths}</math>)</li> </ul>	<ul style="list-style-type: none"> <li>Recognises the place value of digits in whole numbers by partitioning and recombining using multiples of 100 000, 10 000, 1000, 100, 10 and 1 (e.g. <math>632\ 531 = 6\ 00\ 000 + 30\ 000 + 2\ 000 + 500 + 30 + 1</math>; <math>632\ 531 = 632\ 000 + 531</math>; <math>632\ 531 = 602\ 500 + 30\ 031</math>)</li> <li>Recognises the place value of digits in decimal fractions (in the context of measurement) to at least 1-decimal place by partitioning and recombining using multiples of 10, 1 and tenths (e.g. <math>63.2 = 60 + 3 + 2\text{-tenths}</math>)</li> </ul>	<ul style="list-style-type: none"> <li>Recognises the place value of digits in whole numbers by partitioning and recombining</li> <li>Recognises the place value of digits in decimal fractions to at least 2-decimal places by partitioning and recombining using multiples of 10, 1, tenths and hundredths (e.g. <math>63.24 = 60 + 3 + 2\text{-tenths} + 4\text{-hundredths}</math>)</li> </ul>		
Problems (as a pedagogical device)	Equivalence	<ul style="list-style-type: none"> <li>Recognises and uses equivalent forms of numbers including:                             <ul style="list-style-type: none"> <li>common fractions with denominators that are multiples of each other in the context of problems</li> <li>converting between common fractions and decimal fractions in the context of measurement, e.g. <math>2\frac{1}{2}\text{ cm} = 2,5\text{ cm}</math></li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Recognises and uses equivalent forms of numbers including:                             <ul style="list-style-type: none"> <li>common fractions with denominators that are multiples of each other in the context of problems</li> <li>converting between common fractions and decimal fractions in the context of measurement, e.g. <math>2\frac{1}{2}\text{ cm} = 2,5\text{ cm}</math></li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Recognises and uses equivalent forms of numbers including:                             <ul style="list-style-type: none"> <li>common fractions with denominators that are multiples of each other</li> <li>converting between percentages; common fractions; and, decimal fractions<sup>1</sup>, e.g. <math>35\% = \frac{35}{100} = 0,35</math></li> </ul> </li> </ul> <p><sup>1</sup> where the denominators of the common fractions are factors of 100</p>	<ul style="list-style-type: none"> <li>Recognises and uses equivalent forms of numbers including:                             <ul style="list-style-type: none"> <li>common fractions</li> <li>converting between percentages; common fractions; and, decimal fractions</li> </ul> </li> </ul>	
	Problem types	<ul style="list-style-type: none"> <li>In a number range appropriate to the grade, solves and explains solutions to everyday situations/problems that involve:                             <ul style="list-style-type: none"> <li>equal sharing in situations that involve left-overs/reminders that can easily be partitioned in different ways<sup>1</sup></li> <li>unequal sharing<sup>2</sup></li> <li>calculations with common fractions in context<sup>3</sup></li> <li>money problems involving totals and change (using age, grade and number-range appropriate strategies – see below)</li> </ul> </li> </ul> <p><sup>1</sup> to introduce the concept of a part of a whole (unitary, non-unitary fractions, and equivalent fractions)  <sup>2</sup> to introduce the concept of ratio  <sup>3</sup> limited to like fractions and whole numbers and fractions</p>	<ul style="list-style-type: none"> <li>In a number range appropriate to the grade, solves and explains solutions to everyday situations/problems that involve:                             <ul style="list-style-type: none"> <li>equal sharing</li> <li>unequal sharing</li> <li>calculations with common fractions in context<sup>1</sup></li> <li>money problems involving profit and loss (using age, grade and number-range appropriate strategies – see below)</li> </ul> </li> </ul> <p><sup>1</sup> limited to like fractions and whole numbers and fractions</p>	<ul style="list-style-type: none"> <li>In a number range appropriate to the grade, solves and explains solutions to everyday situations/problems that involve:                             <ul style="list-style-type: none"> <li>equal sharing</li> <li>unequal sharing</li> <li>calculations with common fractions in context<sup>1</sup></li> <li>accounts and discounts</li> <li>perimeter and area of rectangles and square, in the context of measurement</li> <li>surface area, volume and the dimensions of rectangular prisms, in the context of measurement (using age, grade and number-range appropriate strategies – see below)</li> </ul> </li> </ul> <p><sup>1</sup> limited to fractions in which one denominator is a multiple of the other and whole numbers and fractions</p>	<ul style="list-style-type: none"> <li>In a number range appropriate to the grade, solves and explains solutions to everyday situations/problems that involve:                             <ul style="list-style-type: none"> <li>equal sharing</li> <li>unequal sharing</li> <li>calculations with common fractions in context</li> <li>calculations with integers in context</li> <li>money problems involving loans; simple interest, hire purchase; exchange rates</li> <li>perimeter and area of geometric figures, in the context of measurement</li> <li>surface area, volume and the dimensions of geometric figures, in the context of measurement (using age, grade and number-range appropriate strategies – see below)</li> </ul> </li> </ul>	

## Number, Operations and Relationships

		Grade 4	Grade 5	Grade 6	Grade 7	
Calculating	Problem-solving strategies	<ul style="list-style-type: none"> <li>For the problem types listed above, the learners will select strategies appropriate to the problem and number range from:                             <ul style="list-style-type: none"> <li>drawings<sup>1</sup></li> <li>combination of drawings and numbers</li> <li>numerical representations<sup>2</sup></li> <li>numerical algorithms<sup>2</sup></li> </ul> </li> </ul> <p><sup>1</sup> limited to new situations/problems, e.g. problems leading to fractions, ratio and rate</p> <p><sup>2</sup> using conventions developed for calculations with numbers (see corresponding manipulating number section)</p>	<ul style="list-style-type: none"> <li>For the problem types listed above, the learners will select strategies appropriate to the problem and number range from:                             <ul style="list-style-type: none"> <li>numerical representations<sup>1</sup></li> <li>numerical algorithms<sup>2</sup></li> </ul> </li> </ul> <p><sup>1</sup> using conventions developed for calculations with numbers (see corresponding manipulating number section)</p>	<ul style="list-style-type: none"> <li>For the problem types listed above, the learners will select strategies appropriate to the problem and number range from:                             <ul style="list-style-type: none"> <li>numerical representations<sup>1</sup></li> <li>numerical algorithms<sup>1</sup></li> </ul> </li> </ul> <p><sup>1</sup> using conventions developed for calculations with numbers (see corresponding manipulating number section)</p>	<ul style="list-style-type: none"> <li>For the problem types listed above, the learners will select strategies appropriate to the problem and number range from:                             <ul style="list-style-type: none"> <li>numerical representations<sup>1</sup></li> <li>numerical algorithms<sup>1</sup></li> </ul> </li> </ul> <p><sup>1</sup> using conventions developed for calculations with numbers (see corresponding manipulating number section)</p>	
	Mental arithmetic	<ul style="list-style-type: none"> <li>Manipulate numbers to perform mental arithmetic<sup>1</sup> that involves:                             <ul style="list-style-type: none"> <li>single-digit arithmetic</li> <li>arithmetic with 10s and multiples of 10</li> <li>adding and subtracting to 10s and multiples of 10</li> <li>completing 10s to multiples of 10</li> <li>bridging 10s and multiples of 10 (as an application of completing 10s and single-digit arithmetic</li> <li>doubling and halving</li> <li>multiplication facts</li> </ul> </li> </ul> <p><sup>1</sup> In order to create an awareness of: The reciprocal relationship between multiplication and division e.g. if <math>5 \times 3 = 15</math> then <math>15 \div 3 = 5</math> and <math>15 \div 5 = 3</math>; and the commutative, associative and distributive properties with whole numbers</p>	<ul style="list-style-type: none"> <li>Manipulate numbers to perform mental arithmetic<sup>1</sup> that involves:                             <ul style="list-style-type: none"> <li>single-digit arithmetic</li> <li>arithmetic with 10s and multiples of 10</li> <li>adding and subtracting to 10s and multiples of 10</li> <li>completing 10s to multiples of 10</li> <li>bridging 10s and multiples of 10 (as an application of completing 10s and single-digit arithmetic</li> <li>doubling and halving</li> <li>multiplication facts</li> </ul> </li> </ul> <p><sup>1</sup> In order to create an awareness of: The reciprocal relationship between multiplication and division e.g. if <math>5 \times 3 = 15</math> then <math>15 \div 3 = 5</math> and <math>15 \div 5 = 3</math>; and the commutative, associative and distributive properties with whole numbers</p>	<ul style="list-style-type: none"> <li>Manipulate numbers to perform mental arithmetic<sup>1</sup> that involves:                             <ul style="list-style-type: none"> <li>single-digit arithmetic</li> <li>arithmetic with 10s and multiples of 10</li> <li>adding and subtracting to 10s and multiples of 10</li> <li>completing 10s to multiples of 10</li> <li>bridging 10s and multiples of 10 (as an application of completing 10s and single-digit arithmetic</li> <li>doubling and halving</li> <li>multiplication facts</li> </ul> </li> </ul> <p><sup>1</sup> In order to create an awareness of: The reciprocal relationship between multiplication and division e.g. if <math>5 \times 3 = 15</math> then <math>15 \div 3 = 5</math> and <math>15 \div 5 = 3</math>; the commutative, associative and distributive properties with whole numbers and divisibility rules</p>	<ul style="list-style-type: none"> <li>Manipulate numbers to perform mental arithmetic<sup>1</sup> that involves:                             <ul style="list-style-type: none"> <li>single-digit arithmetic</li> <li>arithmetic with 10s and multiples of 10</li> <li>adding and subtracting to 10s and multiples of 10</li> <li>completing 10s to multiples of 10</li> <li>bridging 10s and multiples of 10 (as an application of completing 10s and single-digit arithmetic</li> <li>doubling and halving</li> <li>multiplication facts</li> </ul> </li> </ul> <p><sup>1</sup> In order to create an awareness of: The reciprocal relationship between multiplication and division e.g. if <math>5 \times 3 = 15</math> then <math>15 \div 3 = 5</math> and <math>15 \div 5 = 3</math>; the commutative, associative and distributive properties with whole numbers and divisibility rules</p>	
	Calculations	<ul style="list-style-type: none"> <li>Can, using appropriate symbols and mathematical conventions, record calculations involving:                             <ul style="list-style-type: none"> <li>addition and subtraction with whole numbers<sup>1</sup></li> <li>addition and subtraction of like fractions and mixed numbers (with like fractions)</li> <li>multiplication of whole numbers</li> <li>division of whole numbers</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Can, using appropriate symbols and mathematical conventions, record calculations involving:                             <ul style="list-style-type: none"> <li>addition and subtraction with whole numbers</li> <li>addition and subtraction of like fractions and mixed numbers (with like fractions)</li> <li>multiplication of whole numbers</li> <li>division of whole numbers</li> <li>determining fractions of whole numbers which result in whole numbers</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Can, using appropriate symbols and mathematical conventions, record calculations involving:                             <ul style="list-style-type: none"> <li>addition and subtraction of whole numbers and positive decimal fractions with at least 2 decimal places</li> <li>addition and subtraction of fractions with denominators which are multiples of each other and mixed numbers (where fractions have denominators which are multiples of each other)</li> <li>multiplication of whole numbers</li> <li>division of whole numbers</li> <li>multiplication and division of decimal fractions by 10, 100 and 1 000 to at least 2 decimal places</li> <li>determining fractions of whole numbers</li> <li>determining percentages of whole numbers<sup>1</sup></li> <li>multiple operations on whole numbers with or without brackets</li> </ul> </li> </ul> <p><sup>1</sup> 1%, 5%, 10%, 15%, 20%, 25%, 50% and 75%</p>	<ul style="list-style-type: none"> <li>Can, using appropriate symbols and mathematical conventions, record calculations involving:                             <ul style="list-style-type: none"> <li>addition and subtraction with integers, common fractions and decimal fractions to at least 2 decimal places</li> <li>multiplication of common fractions and positive decimal fractions to at least 2 decimal places</li> <li>division of positive decimal fractions with at least 3-decimal places by whole numbers</li> <li>determining fractions of whole numbers</li> <li>determining percentages of whole numbers</li> <li>multiple operations on positive whole numbers with or without brackets</li> <li>exponents</li> </ul> </li> </ul>	
Calculation strategies	<ul style="list-style-type: none"> <li>Calculates by selecting calculation-appropriate techniques (strategies) from the following:                             <ul style="list-style-type: none"> <li>number lines</li> <li>ignoring the zeroes</li> <li>breaking up</li> <li>doubling and halving</li> <li>completing the tens</li> <li>counting on and counting back</li> <li>adding / subtracting the parts</li> <li>rounding and compensating</li> <li>using the commutative property</li> <li>using a calculator</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Calculates by selecting calculation-appropriate techniques (strategies) from the following:                             <ul style="list-style-type: none"> <li>number lines</li> <li>ignoring the zeroes</li> <li>breaking up</li> <li>doubling and halving</li> <li>completing the tens</li> <li>counting on and counting back</li> <li>adding / subtracting / multiplying the parts</li> <li>rounding and compensating</li> <li>using the commutative and associative</li> <li>changing / multiplying the numbers by the same amount</li> <li>using a calculator</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Calculates by selecting calculation-appropriate techniques (strategies) from the following:                             <ul style="list-style-type: none"> <li>number lines</li> <li>ignoring the zeroes</li> <li>breaking up</li> <li>doubling and halving</li> <li>completing the tens</li> <li>adding / subtracting / multiplying the parts</li> <li>rounding and compensating</li> <li>using the commutative, associative and distributive properties</li> <li>changing / multiplying the numbers by the same amount</li> <li>using a calculator</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Calculates by selecting calculation-appropriate techniques (strategies) from the following:                             <ul style="list-style-type: none"> <li>number lines</li> <li>ignoring the zeroes</li> <li>breaking up</li> <li>doubling and halving</li> <li>completing the tens</li> <li>adding / subtracting / multiplying the parts</li> <li>rounding and compensating</li> <li>Using the commutative, associative and distributive properties</li> <li>changing / multiplying the numbers by the same amount</li> <li>using a calculator</li> </ul> </li> </ul>		

### Number, Operations and Relationships

		Grade 4	Grade 5	Grade 6	Grade 7
Reasoning					
	Reasoning	<ul style="list-style-type: none"> <li>In reflecting on solutions to the situations/problems listed above, learners will:                             <ul style="list-style-type: none"> <li>explain their own solutions</li> <li>listen to and compare the solutions developed by their peers in terms of their efficiency</li> <li>apply the solutions developed by their peers to similar problems</li> <li>notice patterns in solutions across similar problem types</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>In reflecting on solutions to the situations/problems listed above, learners will:                             <ul style="list-style-type: none"> <li>explain their own solutions</li> <li>listen to and compare the solutions developed by their peers in terms of their efficiency</li> <li>apply the solutions developed by their peers to similar problems</li> <li>notice patterns in solutions across similar problem types</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>In reflecting on solutions to the situations/problems listed above, learners will:                             <ul style="list-style-type: none"> <li>explain their own solutions</li> <li>listen to and compare the solutions developed by their peers in terms of their efficiency</li> <li>apply the solutions developed by their peers to similar problems</li> <li>notice patterns in solutions across similar problem types</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>In reflecting on solutions to the situations/problems listed above, learners will:                             <ul style="list-style-type: none"> <li>explain their own solutions</li> <li>listen to and compare the solutions developed by their peers in terms of their efficiency</li> <li>apply the solutions developed by their peers to similar problems</li> <li>notice patterns in solutions across similar problem types</li> </ul> </li> </ul>

### Patterns, functions and algebra

		Grade 4	Grade 5	Grade 6	Grade 7
Pictures and words					
	Investigate and extend	<ul style="list-style-type: none"> <li>Investigates and extends numeric and geometric patterns looking for a relationship or rules, including patterns:                             <ul style="list-style-type: none"> <li>represented in physical or diagrammatic form</li> <li>not limited to sequences involving constant difference or ratio</li> <li>represented in tables</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Investigates and extends numeric and geometric patterns looking for a relationship or rules, including patterns:                             <ul style="list-style-type: none"> <li>represented in physical or diagrammatic form</li> <li>not limited to sequences involving constant difference or ratio</li> <li>represented in tables</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Investigates and extends numeric and geometric patterns looking for a relationship or rules, including patterns:                             <ul style="list-style-type: none"> <li>represented in physical or diagrammatic form</li> <li>not limited to sequences involving constant difference or ratio</li> <li>represented in tables</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Investigates and extends numeric and geometric patterns looking for a relationship or rules, including patterns:                             <ul style="list-style-type: none"> <li>represented in physical or diagrammatic form</li> <li>not limited to sequences involving constant difference or ratio</li> <li>represented in tables</li> </ul> </li> </ul>
Tables, formulae and equations	Input and output values	<ul style="list-style-type: none"> <li>Determines output values for given input values or input values for given output values in:                             <ul style="list-style-type: none"> <li>flow diagrams</li> <li>tables</li> </ul> </li> <li>Determine rules for given sets paired input and output values (in flow diagrams) using:                             <ul style="list-style-type: none"> <li>verbal descriptions</li> <li>flow diagrams</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Determines output values for given input values or input values for given output values in:                             <ul style="list-style-type: none"> <li>flow diagrams</li> <li>tables</li> </ul> </li> <li>Determine rules for given sets paired input and output values (in flow diagrams) using:                             <ul style="list-style-type: none"> <li>verbal descriptions</li> <li>flow diagrams</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Determines output values for given input values or input values for given output values in:                             <ul style="list-style-type: none"> <li>flow diagrams</li> <li>tables</li> </ul> </li> <li>Determine rules for given sets paired input and output values (in tables and/or flow diagrams) using:                             <ul style="list-style-type: none"> <li>verbal descriptions</li> <li>flow diagrams</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Determines output values for given input values or input values for given output values in:                             <ul style="list-style-type: none"> <li>flow diagrams</li> <li>tables</li> <li>formula</li> </ul> </li> <li>Determine rules for given sets paired input and output values (in tables and/or flow diagrams) using:                             <ul style="list-style-type: none"> <li>verbal descriptions</li> <li>flow diagrams</li> <li>formula</li> </ul> </li> </ul>
	Equivalence	<ul style="list-style-type: none"> <li>Determines, through discussion and comparison, the equivalence of different descriptions of the same relationship or rule presented:                             <ul style="list-style-type: none"> <li>verbally</li> <li>in flow diagrams</li> <li>by number sentences</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Determines, through discussion and comparison, the equivalence of different descriptions of the same relationship or rule presented:                             <ul style="list-style-type: none"> <li>verbally</li> <li>in flow diagrams</li> <li>by number sentences</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Determines, through discussion and comparison, the equivalence of different descriptions of the same relationship or rule presented:                             <ul style="list-style-type: none"> <li>verbally</li> <li>in flow diagrams</li> <li>by number sentences</li> <li>in tables</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Determines, through discussion and comparison, the equivalence of different descriptions of the same relationship or rule presented:                             <ul style="list-style-type: none"> <li>verbally</li> <li>in flow diagrams</li> <li>by equations or expressions in order to select the most useful representation for a given situation</li> </ul> </li> <li>Translate between relationships expressed in flow diagrams into algebraic formula</li> </ul>
	Equations	<ul style="list-style-type: none"> <li>Reverses flow diagrams (“undoes” the operation(s)) to determine input values for given output values</li> <li>Solves or completes number sentences by inspection or by trial-and-improvement checking the solutions by substitution e.g. <math>\square + 4 = 12^1</math></li> </ul> <p><small><sup>1</sup> This should be integrated in mental arithmetic and calculations</small></p>	<ul style="list-style-type: none"> <li>Reverses flow diagrams (“undoes” the operation(s)) to determine input values for given output values</li> <li>Solves or completes number sentences by inspection or by trial-and-improvement checking the solutions by substitution e.g. <math>\square + 4 = 12^1</math></li> </ul> <p><small><sup>1</sup> This should be integrated in mental arithmetic and calculations</small></p>	<ul style="list-style-type: none"> <li>Reverses flow diagrams (“undoes” the operation(s)) to determine input values for given output values</li> <li>Solves or completes number sentences by inspection or by trial-and-improvement checking the solutions by substitution e.g. <math>\square \div 4 = 12^1</math></li> </ul> <p><small><sup>1</sup> This should be integrated in mental arithmetic and calculations</small></p>	<ul style="list-style-type: none"> <li>Reverses flow diagrams (“undoes” the operation(s)) to determine input values for given output values</li> <li>Solves equations by inspection or by trial-and-improvement checking the solutions by substitution</li> <li>Solves equations in context</li> </ul>

Patterns, functions and algebra					
		Grade 4	Grade 5	Grade 6	Grade 7
Reas	Graphs			<ul style="list-style-type: none"> <li>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</li> </ul>	<ul style="list-style-type: none"> <li>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</li> <li>Represents relationship between input and output on labelled axes</li> <li>Investigates the relationship(s) between formulae and their graphs</li> </ul>
	Reasoning	<ul style="list-style-type: none"> <li>In reflecting on solutions to the situations listed above, learners will:                             <ul style="list-style-type: none"> <li>describe their observations</li> <li>justify elements in the pattern</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>In reflecting on solutions to the situations listed above, learners will:                             <ul style="list-style-type: none"> <li>describe their observations</li> <li>justify elements in the pattern</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>In reflecting on solutions to the situations listed above, learners will:                             <ul style="list-style-type: none"> <li>describe their observations</li> <li>justify elements in the pattern</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>In reflecting on solutions to the situations listed above, learners will:                             <ul style="list-style-type: none"> <li>describe their observations</li> <li>justify elements in the pattern</li> </ul> </li> </ul>

Space and shape (Geometry)					
		Grade 4	Grade 5	Grade 6	Grade 7
Reas	Recognises, identifies and names	<ul style="list-style-type: none"> <li>Recognises, identifies and names:                             <ul style="list-style-type: none"> <li>2-D shapes (triangles, rectangles [including squares], non-rectangular quadrilateral, <math>n</math>-sided polygons [<math>n = 3; 4; 5; 6</math> and <math>8</math>] and circles</li> <li>3-D objects (rectangular prisms [including cubes] and cylinders, pyramids, cones and spheres</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Recognises, identifies and names 2-D shapes and 3-D objects previously dealt with focussing on:                             <ul style="list-style-type: none"> <li>similarities and differences between squares and other rectangles</li> <li>similarities and differences between cubes and other rectangular prisms</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Recognises, identifies and names 2-D shapes and 3-D objects previously dealt with focussing on:                             <ul style="list-style-type: none"> <li>similarities and differences between rectangles and other parallelograms</li> <li>similarities and differences between tetrahedrons and other pyramids</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Recognises, identifies and names 2-D shapes and 3-D objects previously dealt with focussing on:                             <ul style="list-style-type: none"> <li>similarities and differences between all quadrilaterals</li> <li>similarities and differences between different polyhedra</li> </ul> </li> </ul>
	Making / constructing	<ul style="list-style-type: none"> <li>Use physical shapes and objects to investigate different:                             <ul style="list-style-type: none"> <li>arrangements of 2-D shapes</li> <li>arrangements of 3-D objects and their nets</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Use physical objects to investigate different:                             <ul style="list-style-type: none"> <li>nets of 3-D objects including prisms and pyramids</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Use physical objects to investigate different:                             <ul style="list-style-type: none"> <li>Polyhedra including anti-prisms and their nets</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Use physical objects to investigate different:                             <ul style="list-style-type: none"> <li>polyhedra including regular polyhedra (Euclidean solids) and semi-regular polyhedra</li> </ul> </li> </ul>
	Properties	<ul style="list-style-type: none"> <li>Describes, sorts and compares:                             <ul style="list-style-type: none"> <li>2-D shapes in terms of length of sides, size of angles, number of sides, number of vertices, symmetry and relationships between these attributes</li> <li>3-D objects in terms of flat or curved surfaces and straight or round edges, the 2-D shapes of their faces and the relationships between these attributes</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Describes, sorts and compares:                             <ul style="list-style-type: none"> <li>2-D shapes in terms of length of sides, size of angles, number of sides, number of vertices, symmetry and relationships between these attributes</li> <li>3-D objects in terms of the 2-D shapes of their faces and the number of faces</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Describes, sorts and compares:                             <ul style="list-style-type: none"> <li>2-D shapes in terms of length of sides, size of angles, number of sides, number of vertices, symmetry and relationships between these attributes</li> <li>3-D objects in terms of the number of faces, vertices and edges</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Describes, sorts and compares:                             <ul style="list-style-type: none"> <li>2-D shapes<sup>1</sup> in terms of length of sides, size of angles, number of sides, number of vertices, symmetry, parallel and perpendicular sides and relationships between these attributes</li> <li>3-D objects in terms of the number of faces, vertices and edges</li> </ul> </li> </ul>
	Position and views	<ul style="list-style-type: none"> <li>Describes positional relationships between shapes and/or objects and between people</li> <li>Describes changes in the view of an object held in different positions</li> </ul>	<ul style="list-style-type: none"> <li>Locates position on a coded (labelled) grid (including maps) and traces a path between positions following verbal and written instructions</li> <li>Describes and sketches views of a simple 3-D object in different positions</li> </ul>	<ul style="list-style-type: none"> <li>Locates positions on a coded grid, describes how to move between positions on the grid and recognises maps as grids</li> <li>Draws and interprets sketches of simple 3-D objects from different positions (perspectives)</li> </ul>	<ul style="list-style-type: none"> <li>Locates positions on co-ordinate systems (ordered grids) and maps and describes how to move between positions using:                             <ul style="list-style-type: none"> <li>Horizontal and vertical change</li> <li>Compass directions</li> </ul> </li> <li>Draws and interprets sketches of solids from different perspectives</li> </ul>
	Transformations, similarity and congruency	<ul style="list-style-type: none"> <li>Use physical shapes and objects to:                             <ul style="list-style-type: none"> <li>investigate movement of 2-D shapes</li> <li>make patterns including tessellations</li> <li>trace patterns involving movement</li> </ul> </li> <li>Describes movement of shapes, objects and people that involves distances, directions and half and quarter turns</li> </ul>	<ul style="list-style-type: none"> <li>Use physical shapes and objects to:                             <ul style="list-style-type: none"> <li>make and investigate tessellations</li> <li>trace patterns involving movement</li> </ul> </li> <li>Records on a grid by tracing, movement of shapes that involves rotations, reflections and translations</li> </ul>	<ul style="list-style-type: none"> <li>Records on a grid movement of shapes that involves rotations, reflections and translations</li> <li>Draws enlargements and reductions of 2-D shapes (at least quadrilaterals and triangles) using grid paper to compare their size and shape</li> </ul>	<ul style="list-style-type: none"> <li>Uses transformations (rotations, reflections, translations and dilations) and symmetry to investigate properties of geometric figures</li> <li>Recognises and describes the properties of similar and congruent figures and the difference between them</li> </ul>
	Symmetry	<ul style="list-style-type: none"> <li>Recognises and describes line symmetry in 2-D shapes and the environment</li> <li>Creates/completes symmetrical pictures and shapes</li> </ul>	<ul style="list-style-type: none"> <li>Recognises and describes reflective and rotational symmetry in 2-D shapes</li> <li>Creates/completes symmetrical shapes</li> </ul>	<ul style="list-style-type: none"> <li>Recognises and describes reflective and rotational symmetry in 2-D shapes</li> </ul>	<ul style="list-style-type: none"> <li>Recognises and describes symmetry in polygons</li> </ul>

Measurement					
		Grade 4	Grade 5	Grade 6	Grade 7
	Time	<ul style="list-style-type: none"> <li>Reads, tells and writes analogue, digital and 24-hour time to at least the nearest minute and second</li> <li>Solves problems involving calculation and conversion between appropriate time units including: seconds, minutes, hours, days, weeks, months and years</li> </ul>	<ul style="list-style-type: none"> <li>Reads, tells and writes analogue, digital and 24-hour time to at least the nearest minute and second</li> <li>Solves problems involving calculation and conversion between appropriate time units including: decades, centuries and millennia</li> </ul>	<ul style="list-style-type: none"> <li>Reads, tells and writes analogue, digital and 24-hour time to at least the nearest minute and second</li> <li>Solves problems involving calculation and conversion between appropriate time units including: time zones and differences</li> </ul>	<ul style="list-style-type: none"> <li>Solves problems involving time including: relating time, distance and speed</li> </ul>
	Length (including perimeter)	<ul style="list-style-type: none"> <li>Compares and orders objects in terms of length by indirect comparison using standard measuring instruments (e.g. rulers, metre sticks, tape measures, trundle wheels etc.) and corresponding units (e.g. millimetres, centimetres and metres)</li> <li>Solves problems involving selecting, calculating and converting between millimetres, centimetres, metres and kilometres</li> </ul>	<ul style="list-style-type: none"> <li>Compares and orders objects in terms of length by indirect comparison using standard measuring instruments (e.g. rulers, metre sticks, tape measures, trundle wheels etc.) and corresponding units (e.g. millimetres, centimetres and metres)</li> <li>Solves problems involving selecting, calculating and converting between millimetres, centimetres, metres and kilometres</li> </ul>	<ul style="list-style-type: none"> <li>Compares and orders objects in terms of length by indirect comparison using standard measuring instruments (e.g. rulers, metre sticks, tape measures, trundle wheels etc.) and corresponding units (e.g. millimetres, centimetres and metres)</li> <li>Solves problems involving selecting, calculating and converting between millimetres, centimetres, metres and kilometres</li> </ul>	<ul style="list-style-type: none"> <li>Solves problems involving length using                             <ul style="list-style-type: none"> <li>estimation</li> <li>converting between appropriate metric units of length</li> </ul> </li> </ul>
	Mass	<ul style="list-style-type: none"> <li>Compares and orders objects in terms of mass by indirect comparison using standard measuring instruments (e.g. kitchen scales, bathroom scales etc.) and corresponding units (e.g. grams and kilograms)</li> <li>Solves problems involving selecting, calculating and converting between the standard units listed above</li> </ul>	<ul style="list-style-type: none"> <li>Compares and orders objects in terms of mass by indirect comparison using standard measuring instruments (e.g. kitchen scales, bathroom scales etc.) and corresponding units (e.g. grams and kilograms)</li> <li>Solves problems involving selecting, calculating and converting between the standard units listed above</li> </ul>	<ul style="list-style-type: none"> <li>Compares and orders objects in terms of mass by indirect comparison using standard measuring instruments (e.g. kitchen scales, bathroom scales etc.) and corresponding units (e.g. grams and kilograms)</li> <li>Solves problems involving selecting, calculating and converting between the standard units listed above</li> </ul>	
	Temperature	<ul style="list-style-type: none"> <li></li> </ul>	<ul style="list-style-type: none"> <li>Compares and orders objects in terms of their temperature by indirect comparison using standard measuring instruments (e.g. thermometers) and corresponding units (degrees Celsius)</li> </ul>	<ul style="list-style-type: none"> <li>Compares and orders objects in terms of their temperature by indirect comparison using standard measuring instruments (e.g. thermometers) and corresponding units (degrees Celsius)</li> </ul>	
	Capacity and volume	<ul style="list-style-type: none"> <li>Compares and orders objects in terms of capacity by indirect comparison using standard measuring instruments (e.g. measuring spoons, cups and jugs) and corresponding units (e.g. millilitres and litres)</li> <li>Solves problems involving selecting, calculating and converting between the standard units listed above</li> <li>Compares and orders objects in terms of volume by indirect comparison using non-standard measures (e.g. packing with rice, marbles, blocks)</li> </ul>	<ul style="list-style-type: none"> <li>Compares and orders objects in terms of capacity by indirect comparison using standard measuring instruments (e.g. measuring spoons, cups and jugs) and corresponding units (e.g. millilitres and litres)</li> <li>Solves problems involving selecting, calculating and converting between the standard units listed above</li> <li>Compares and orders objects, including rectangular prisms, in terms of volume by indirect comparison using non-standard measures (e.g. cubes)</li> </ul>	<ul style="list-style-type: none"> <li>Compares and orders objects in terms of capacity by indirect comparison using standard measuring instruments (e.g. measuring spoons, cups and jugs) and corresponding units (e.g. millilitres and litres)</li> <li>Solves problems involving selecting, calculating and converting between the standard units listed above</li> <li>Compares and orders objects, including rectangular prisms, in terms of volume by indirect comparison using non-standard measures (e.g. cubes)</li> <li>Compares and orders objects, including rectangular prisms, in terms of volume by direct comparison using standard measures (e.g. centimetre cubes)</li> <li>Develop an understanding of why the volume of rectangular prisms is given by length multiplied by width multiplied by height</li> </ul>	<ul style="list-style-type: none"> <li>Solves problems involving volume using                             <ul style="list-style-type: none"> <li>estimation</li> <li>converting between appropriate metric units</li> <li>Calculate volume of rectangular-based prisms and triangular-based prisms using formula</li> </ul> </li> </ul>
	Area (including surface area)	<ul style="list-style-type: none"> <li>Covers objects to compare and orders them in terms of area by indirect comparison using non-standard standard measures (e.g. stones, beans, bottle tops and tiles etc.)</li> <li>Compares and orders objects in terms of area by indirect comparison using non-standard measuring instruments (e.g. grids)</li> </ul>	<ul style="list-style-type: none"> <li>Compares and orders objects in terms of area by indirect comparison using non-standard measuring instruments (e.g. square grids)</li> <li>Compares and orders objects in terms of area by indirect comparison using standard measuring instruments (e.g. centimetre square grids)</li> </ul>	<ul style="list-style-type: none"> <li>Compares and orders objects in terms of area by indirect comparison using standard measuring instruments (e.g. centimetre square grids)</li> <li>Compares and orders objects in terms of area by indirect comparison using standard measuring instruments (e.g. centimetre square grids)</li> <li>Uses square grids to determine the area of polygons in order to develop formula for calculating the area of squares and rectangles</li> </ul>	<ul style="list-style-type: none"> <li>Solves problems involving area of 2-D shapes and surface area of 3-D objects using                             <ul style="list-style-type: none"> <li>estimation</li> <li>converting between appropriate metric units</li> <li>Investigates the relationship between area of rectangles and area of triangles</li> <li>Calculates the area of rectangles (including squares) and triangles using appropriate formula</li> </ul> </li> </ul>
	Angles		<ul style="list-style-type: none"> <li>Compares and orders angles recognised in 2-D shapes, 3-D objects and the environment in terms of smaller than a right angle, a right angle or larger than a right angle</li> </ul>	<ul style="list-style-type: none"> <li>Compares and orders angles recognised in 2-D shapes, 3-D objects and the environment in terms of smaller than a right angle, a right angle or larger than a right angle</li> </ul>	<ul style="list-style-type: none"> <li>Classifies angles as acute, right, obtuse, straight, reflex or revolution</li> <li>Estimates, compares, measures and draws angles accurate to one degree using protractors</li> </ul>

Data Handling					
		Grade 4	Grade 5	Grade 6	Grade 7
Statistics	Collecting	<ul style="list-style-type: none"> <li>Poses simple questions about his/her school and family environment and identifies appropriate data sources</li> <li>Collects data in the school and family environment posed by the teacher and class</li> </ul>	<ul style="list-style-type: none"> <li>Poses simple questions about his/her school and family environment and identifies appropriate data sources</li> <li>Creates simple data collection sheets in order to collect data in the school and family environment posed by the teacher and class</li> </ul>	<ul style="list-style-type: none"> <li>Poses simple questions about his/her school and family environment and identifies appropriate data sources (distinguishing between population and samples)</li> <li>Creates simple data collection sheets (requiring tallies) and questionnaires (with closed responses) in order to collect data in the school and family environment posed by the teacher, class or themselves</li> </ul>	<ul style="list-style-type: none"> <li>Poses questions relating to human rights, social, economic, environmental and political issues in his/her environment.</li> <li>Selects appropriate sources for the collection of data (including peers, family, newspapers, books, magazines)</li> <li>Distinguishes between samples and populations, and suggests appropriate samples for investigation (including random samples)</li> </ul>
	Sorting and organising	<ul style="list-style-type: none"> <li>Organises and records data using tallies and tables</li> <li>Gives reasons for data being sorted in particular ways</li> </ul>	<ul style="list-style-type: none"> <li>Organises and records data using tallies and tables</li> <li>Examines data to determine the mode (most frequent data item) in order to describe the trend in the data</li> <li>Gives reasons for data being sorted in particular ways</li> </ul>	<ul style="list-style-type: none"> <li>Organises and records data using tallies and tables</li> <li>Examines data to determine the mode (most frequent data item) and median (midpoint of ordered numerical data) in order to describe the trend in the data</li> <li>Gives reasons for data being sorted in particular ways</li> </ul>	<ul style="list-style-type: none"> <li>Organises (including grouping where necessary) and records data using:                             <ul style="list-style-type: none"> <li>tallies</li> <li>tables</li> <li>dot plots</li> </ul> </li> <li>Summarises ungrouped numerical data to determine:                             <ul style="list-style-type: none"> <li>the average (mode, median and mean) and justifies differences in these averages</li> <li>the range (spread of data)</li> </ul> </li> </ul>
	Representing	<ul style="list-style-type: none"> <li>Draws pictograms and bar graphs that have a 1-to-1 correspondence between data and representation</li> </ul>	<ul style="list-style-type: none"> <li>Draws pictograms and bar graphs that have a 1-to-1 and a 1-to-many correspondence between data and representation</li> </ul>	<ul style="list-style-type: none"> <li>Draws                             <ul style="list-style-type: none"> <li>pictograms and</li> <li>bar graphs (including double bar graphs)</li> </ul>                             that have a 1-to-1 and a 1-to-many correspondence between data and representation                         </li> </ul>	<ul style="list-style-type: none"> <li>Draws by hand or using technology to display and interpret grouped and/or ungrouped data                             <ul style="list-style-type: none"> <li>bar graphs (including double bar graphs)</li> <li>histograms with given intervals</li> <li>pie charts</li> <li>line and broken-line graphs</li> </ul> </li> </ul>
	Analysing and answering questions	<ul style="list-style-type: none"> <li>Critically reads and interprets data presented in a variety of ways (including own representations and representations in the media – both words and graphs) to draw conclusions and make predictions sensitive to the role of context (e.g. rural or urban and/or human rights issues etc.)</li> </ul>	<ul style="list-style-type: none"> <li>Critically reads and interprets data presented in a variety of ways (including own representations and representations in the media – both words and graphs) to draw conclusions and make predictions sensitive to the role of context (e.g. rural or urban and/or human rights issues etc.)</li> </ul>	<ul style="list-style-type: none"> <li>Critically reads and interprets data presented in a variety of ways (including own representations and representations in the media – both words and graphs) to draw conclusions and make predictions sensitive to the role of context (e.g. rural or urban and/or human rights issues etc.)</li> </ul>	<ul style="list-style-type: none"> <li>Critically reads and interprets data presented in a variety of ways (including own representations and representations in the media – both words and graphs) to draw conclusions and make predictions sensitive to the role of context (e.g. rural or urban and/or human rights issues etc.)</li> </ul>
	Probability	Probability	<ul style="list-style-type: none"> <li>Compares and classifies events from daily life as:                             <ul style="list-style-type: none"> <li>Certain that they will happen, or</li> <li>Certain they will not happen, or</li> <li>Uncertain</li> </ul> </li> <li>Considers the possible outcomes of a single event and counts the frequency of actual outcomes for a series of trials (e.g. spinning a spinner, tossing a coin, rolling a dice) in order to compare the likelihood of each outcome</li> </ul>	<ul style="list-style-type: none"> <li>Compares, classifies and orders events from daily life on a scale from certain that they will happen to certain that they will not happen</li> <li>Considers the possible outcomes of single and combined event and counts the frequency of actual outcomes for a series of trials (e.g. spinning a spinner, tossing a coin, rolling a dice) in order to compare the likelihood of each outcome</li> </ul>	<ul style="list-style-type: none"> <li>Predicts the likelihood of events in daily life based on observation and places them on a scale from impossible to certain</li> <li>Performs simple experiments where the possible outcomes are equally likely (e.g. spinning a spinner, tossing a coin, rolling a dice) and                             <ul style="list-style-type: none"> <li>determines the frequency of actual outcomes for a series of trials</li> <li>recognise that as the number of trials in an experiment increases, the better the estimate of an event's likelihood becomes</li> </ul> </li> </ul>