NumberSense

Mathematics Programme

Curriculum

Grades R – 3

(May 2023)

Number, Operations and Relationships

		Grade R	Grade 1	Grade 2	Grade 3	

Numbers	Rote counting	• Rote counts in:
		  • 1s from any number between 0 and 50
			• Rote counts forwards and backwards in:
			  • 1s from any number between 0 and 140
			  • 10s from any multiple of 10 between 0 and 120
			  • 2s from any multiple of 2 between 0 and 120
			  • 5s and from any multiple of 5 between 0 and 120
				• Rote counts forwards and backwards in:
				  • 1s from any number between 0 and 200
				  • 10s from any multiple of 10 between 0 and 200
				  • 5s from any multiple of 5 between 0 and 200
				  • 2s from any multiple of 2 between 0 and 200
					• Rote counts forwards and backwards in:
					  • the intervals specified in Grade 2 with increased number ranges
					  • 20s, 25s, 50s and 100s between 0 and at least 1000
					  • fractions (including halves, thirds, fourths and fifths)	

	Counting objects	• Counts to at least 10 everyday objects	• Counts to at least 50 everyday objects[1] [1] *i.e. regroups the objects into groups appropriate to the number of objects being counted*	• Estimates and counts up to at least 200 everyday objects efficiently[1] (including in groups of 2, 5 and 10) [1] *i.e. regroups the objects into groups appropriate to the number of objects being counted*	• Estimates and counts objects efficiently[1] [1] *i.e. regroups the objects into groups appropriate to the number of objects being counted*	
	Reading & writing numbers	• Recognise, identify and read number symbols 1 to 10	• Reads and writes numbers to at least 40 • Recognises South African coins (1c, 2c, 5c, 10c, 20c, 50c, R1, R2 and R5) and South African notes (R10, R20, R50)	• Reads and writes numbers to at least 200 • Reads and writes fraction names (halves, thirds, fourths, fifths etc.) • Recognises South African coins (1c, 2c, 5c, 10c, 20c, 50c, R1, R2 and R5) and South African notes (R10, R20, R100, R200)	• Reads and writes numbers to at least 1000 • Reads and writes fraction names (halves, thirds, fourths, fifths etc.) and fraction notation ($\frac{1}{2}$s, $\frac{1}{3}$s, $\frac{1}{4}$s, $\frac{1}{5}$s etc.)	
	Ordering and comparing	• Orders and compares collections of objects using everyday language (e.g. more, less and the same as etc.)	• Orders and compares whole numbers to at least 40 • Describes position using ordinal numbers (e.g. first, second, third etc.)	• Orders and compares whole numbers to at least 100 • Orders and compares unitary and non-unitary fractions in the context of problems (*see problems as a pedagogical device)*	• Orders and compares whole numbers to at least 1000 • Orders and compares unitary and non-unitary fractions in the context of problems (*see problems as a pedagogical device*	
	Place value		• Recognises the place value of digits in whole numbers to at least 2-digit numbers by partitioning and recombining using multiples of 10 and 1 (e.g. 25 = 20 + 5)	• Recognises the place value of digits in whole numbers to at least 2-digit numbers by partitioning and recombining using multiples of 10 and 1 (e.g. 86 = 80 + 6)	• Recognises the place value of digits in whole numbers to at least 3-digit numbers by partitioning and recombining using multiples of 100, 10 and 1 (e.g. 325 = 300 + 20 + 5; 325 = 320 + 5; 325 = 300 + 25)	

Problems *(as a pedagogical device)*	Problem types	• In a number range appropriate to the grade, solves and explains solutions to everyday situations/problems that involve:
		  • equal sharing[1] (including situations that involve left-overs/remainders) and
		  • change, combine and compare[2]
		(using age, grade and number-range appropriate strategies – see below)
		
		[1] *to lay the foundations for division*
		[2] *to lay the foundations for addition and subtraction*
			• In a number range appropriate to the grade, solves and explains solutions to everyday situations/problems that involve:
			  • equal sharing[1] (including situations that involve left-overs/remainders)
			  • grouping[2] (including situations that involve left-overs/remainders),
			  • change, combine and compare[3]; and
			  • grids; arrays and groups[4]
			(using age, grade and number-range appropriate strategies – see below)
			• In a number range appropriate to the grade, solves and explains solutions to money problems involving totals and change.
			
			[1] *to lay the foundations for division*
			[2] *to lay the foundation for division as repeated addition and subtraction*
			[3] *to lay the foundations for addition and subtraction*
			[4] *to lay the foundations for multiplication (repeated addition)*
				• In a number range appropriate to the grade, solves and explains solutions to everyday situations/problems that involve:
				  • equal sharing[1] (including situations that involve left-overs/remainders)
				  • equal sharing in situations that involve left-overs/remainders that can easily be partitioned[2]
				  • grouping[3] (including situations that involve left-overs/remainders),
				  • change, combine and compare[4]; and
				  • grids; arrays and groups[5]
				(using age, grade and number-range appropriate strategies – see below)
				• In a number range appropriate to the grade, solves and explains solutions to money problems involving totals and change.
				
				[1] *to lay the foundations for division*
				[2] *to introduce the concept of a part of a whole (unitary fractions)*
				[3] *to lay the foundation for division as repeated addition and subtraction*
				[4] *to lay the foundations for addition and subtraction*
				[5] *to lay the foundations for multiplication (repeated addition)*
					• In a number range appropriate to the grade, solves and explains solutions to everyday situations/problems that involve:
					  • equal sharing in situations that involve left-overs/remainders that can easily be partitioned in different ways[1]
					  • unequal sharing[2]
					  • grouping[3] (including situations that involve left-overs/remainders),
					  • change, combine and compare[4]; and
					  • grids; arrays and groups[5]
					(using age, grade and number-range appropriate strategies – see below)
					• In a number range appropriate to the grade, solves and explains solutions to money problems involving totals and change.
					
					[1] *to introduce the concept of a part of a whole (unitary fractions)*
					[2] *to introduce the concept of ratio*
					[3] *to lay the foundation for division as repeated addition and subtraction*
					[4] *to lay the foundations for addition and subtraction*
					[5] *to lay the foundations for multiplication (repeated addition)*	

	Problem-solving strategies	• For the problem types listed above, the learners will use the following strategies:
		  • Modelling
		  • drawings
			• For the problem types listed above, the learners will select strategies appropriate to the problem and number range from:
			  • modelling the problem using counters etc.
			  • drawings
			  • combination of drawings and numbers
				• For the problem types listed above, the learners will select strategies appropriate to the problem and number range from:
				  • drawings[1]
				  • combination of drawings and numbers
				  • numerical representations[2]
				  • number lines
				
				[1] *limited to new situations/problems, e.g. problems leading to fractions*
				[2] *using conventions developed for calculations with numbers (see corresponding manipulating number section)*
					• For the problem types listed above, the learners will select strategies appropriate to the problem and number range from:
					  • drawings[1]
					  • combination of drawings and numbers
					  • numerical representations[2]
					  • number lines
					  • numerical algorithms[2]
					[1] *limited to new situations/problems, e.g. problems leading to fractions*
					[2] *using conventions developed for calculations with numbers (see corresponding manipulating number section)*	

Number, Operations and Relationships						
		Grade R	Grade 1	Grade 2	Grade 3	
Calculating	Mental arithmetic	Manipulate numbers to perform mental arithmetic that involves single-digit arithmetic	• In a number range appropriate to the grade, manipulate numbers to perform mental arithmetic using skills that include: • single-digit arithmetic • arithmetic with 10s and multiples of 10 • adding and subtracting to 10s and multiples of 10 (as in place value, e.g. 54 = 50 + 4; 125 = 100 + 20 + 5; 125 = 100 + 25) • completing 10s to multiples of 10 • bridging 10s and multiples of 10 (as an application of completing 10s and single-digit arithmetic • doubling and halving	• In a number range appropriate to the grade, manipulate numbers to perform mental arithmetic using skills that include: • single-digit arithmetic • arithmetic with 10s and multiples of 10 • adding and subtracting to 10s and multiples of 10 (as in place value, e.g. 54 = 50 + 4; 125 = 100 + 20 + 5; 125 = 100 + 25) • completing 10s to multiples of 10 • bridging 10s and multiples of 10 (as an application of completing 10s and single-digit arithmetic • doubling and halving • multiples; including multiples of 10, 5, 2, 4 and 8	• In a number range appropriate to the grade, manipulate numbers to perform mental arithmetic using skills that include: • single-digit arithmetic • arithmetic with 10s and multiples of 10 • adding and subtracting to 10s and multiples of 10 • completing 10s to multiples of 10 (as in place value, e.g. 54 = 50 + 4; 125 = 100 + 20 + 5; 125 = 100 + 25) • bridging 10s and multiples of 10 (as an application of completing 10s and single-digit arithmetic • doubling and halving • multiples; including multiples of 3, 9, 11, 15 and 20	•
	Calculations		• Using appropriate symbols and mathematical conventions, record calculations involving: • addition and subtraction with combinations of 1- and 2-digit numbers in the number range 1 to 40	• Using appropriate symbols and mathematical conventions, record calculations involving: • addition and subtraction with combinations of 1- and 2-digit numbers • multiplication of 1-digit by 1-digit and 2-digit by 1-digit numbers in the number range 1 to 50	• Using appropriate symbols and mathematical conventions, record calculations involving: • addition and subtraction with combinations of 1-, 2- and 3-digit numbers • addition of like fractions. • multiplication of 1-digit by 1-digit and 2-digit by 1-digit numbers • division of 1-digit by 1-digit and 2-digit by 1-digit numbers	•
	Calculation strategies		• Calculates by selecting calculation-appropriate techniques (strategies) from the following: • modelling • estimation • rounding • counting (back, up, down to, up from) • number lines • breaking down and building up numbers • doubling and halving	• Calculates by selecting calculation-appropriate techniques (strategies) from the following: • modelling • estimation • rounding • counting (back, up, down to, up from) • number lines • breaking down and building up numbers • doubling and halving • using known number facts • arithmetic • rearranging using commutativity	• Calculates by selecting calculation-appropriate techniques (strategies) from the following: • modelling • estimation • rounding • counting (back, up, down to, up from) • number lines • breaking down and building up numbers • doubling and halving • using known number facts • arithmetic • rearranging using commutativity	•
Reasoning	Reasoning	Learners will explain how they solved the problem	• In reflecting on solutions to the situations/problems listed above, learners will: • explain their own solutions	• In reflecting on solutions to the situations/problems listed above, learners will: • explain their own solutions • listen to and describe the solutions developed by their peers	• In reflecting on solutions to the situations/problems listed above, learners will: • explain their own solutions • listen to and describe the solutions developed by their peers • apply the solutions developed by their peers to similar problems	

Patterns, functions and algebra						
		Grade R	Grade 1	Grade 2	Grade 3	
Geometric patterns	Copies and extends patterns	• Using physical objects and drawings, copies and extends simple patterns involving at most two elements/attributes of the form ABABAB…, e.g. • shapes • colours	• Using physical objects and drawings, copies and extends simple patterns involving at most two elements/attributes of the form ABABAB… or ABBABBABBA etc., e.g. • shapes • colours • size	• Using physical objects and drawings, copies and extends simple patterns involving at most three elements/attributes, e.g. • shapes • colours • size • rotation/reflection	• Using physical objects and drawings, copies and extends patterns involving at most three elements/attributes, e.g. • shapes • colours • size • rotation/reflection of more complex forms, e.g. ABCBABCBABCB…	
	Creates patterns	• Creates simple patterns using shapes, colours etc.	• Creates patterns using shapes, colours etc.	• Creates patterns using shapes, colours etc.	• Creates more complex forms of patterns using shapes, colours etc.	
	Describes patterns	•	• Describes observed patterns	• Describes observed patterns	• Describes observed patterns	
Number patterns	Copies and extends patterns		• Copies and extends simple number patterns with a common difference where the pattern starts with the common difference to at most 100, e.g. 3; 6; 9; 12… • Determines output values for given input values and input values for given output values in: • tables • flow diagrams	• Copies and extends simple number patterns: • with a common difference where the pattern does not necessarily start with the common difference, e.g. 5; 8; 11; 14 … • with a common ratio where the pattern starts with the common ratio, e.g. 3; 9; 27; 81… • Determines output values for given input values and input values for given output values; and the relationship between input and output values in: • tables • flow diagrams • other representations	• Copies and extends simple number patterns • Determines output values for given input values and input values for given output values; and the relationship between input and output values in: • tables • flow diagrams • other representations	
	Creates patterns		• Creates patterns involving number	• Creates patterns involving number	• Creates patterns involving number	
	Describes patterns		• Describes observed patterns	• Describes observed patterns • Describes relationships between input and output values	• Describes observed patterns • Describes relationships between input and output values	
Reas	Reasoning	• Learners will explain how they solved the problem	• In reflecting on solutions to the situations listed above, learners will: • explain their own solutions	• In reflecting on solutions to the situations listed above, learners will: • describe their observations • justify elements in the pattern	• In reflecting on solutions to the situations listed above, learners will: • describe their observations • justify elements in the pattern	

Space and shape (Geometry)

	Grade R	Grade 1	Grade 2	Grade 3	

Recognises, identifies and names	• Recognises and classifies:
	  • familiar physical 2-D shapes using obvious attributes (properties such as: straight edges, curved edges and size)
	  • familiar physical 3-D objects using obvious attributes (properties such as: flat surfaces and non-flat surfaces)
		• Recognises and classifies:
		  • familiar physical 2-D shapes and images of 2-D shapes (triangles, rectangles [including squares] and circles) based on their attributes (properties such as: straight edges, curved edges and size)
		  • familiar physical 3-D objects and images of 3-D objects (boxes and balls) in terms of their attributes (properties such as: flat surfaces and non-flat surfaces)
			• Recognises and classifies:
			  • familiar physical 2-D shapes and images of 2-D shapes (triangles, rectangles [including squares] and circles) based on their attributes (properties such as: straight edges, curved edges, angles and size)
			  • familiar physical 3-D objects and images of 3-D objects (boxes [prisms], balls [spheres] and cylinders) in terms of their attributes (properties such as: the shapes of the objects surfaces)
				• Recognises and classifies:
				  • familiar physical 2-D shapes and images of 2-D shapes (triangles, rectangles [including squares], non-rectangular quadrilaterals and circles) based on their attributes (properties such as: straight edges, curved edges, angles and size)
				  • familiar physical 3-D objects and images of 3-D objects (boxes [prisms], balls [spheres] and cylinders) in terms of their attributes (properties such as: the shapes of the objects surfaces)	

Making / constructing	• Uses physical shapes and objects to create own:
	  • arrangements of 2-D shapes; and
	  • arrangements of 3-D objects
		• Uses physical shapes and objects to create own and copies of given (identical) arrangements of 2-D shapes; and
		• Uses physical shapes and objects to create own arrangements of 3-D objects
			• Uses physical shapes and objects to create own and copies of given (including similar):
			  • arrangements of 2-D shapes; and
			  • arrangements of 3-D objects
				• Use physical shapes and objects to investigate different:
				  • arrangements of 2-D shapes; and
				  • arrangements of 3-D objects and their nets	

Properties	• Describes, sorts and compares:
	  • physical 2-D shapes in terms of their size (larger, shorter and equal) by fitting (direct comparison)
	  • physical 3-D objects in terms of size by direct comparison and/or by whether they roll or slide
		• Describes, sorts and compares:
		  • physical 2-D shapes in terms of their size, length of sides and size of angles by fitting (direct comparison)
		  • physical 3-D objects in terms of size by direct comparison and/or by whether they roll or slide
			• Describes, sorts and compares:
			  • physical 2-D shapes in terms of their length of sides and size of angles
			  • physical 3-D objects in terms of flat or curved surfaces, straight or round edges and the shape of their faces
				• Describes, sorts and compares:
				  • 2-D shapes in terms of their length of sides and size of angles, number of sides and number of vertices
				  • 3-D objects in terms of flat or curved surfaces, straight or round edges and the shape of their faces	

Position	• Describes:
	  • positional relationships (in front of, behind, between, next to, on top of and under) between shapes and/or objects and between people
		• Describes:
		  • positional relationships (in front of, behind, between, next to, on top of and under) between shapes and/or objects and between people
			• Describes:
			  • positional relationships (in front of, behind, between, next to, on top of and under) between shapes and/or objects and between people
			  • movements of shapes, objects and people that involve distances, directions and half turns
				• Describes:
				  • positional relationships (in front of, behind, between, next to, on top of and under) between shapes and/or objects and between people
				  • movements of shapes, objects and people that involve distances, directions and half or quarter turns	

Symmetry	• Recognises and describes symmetry in 2-D shapes and the environment	• Recognises and describes symmetry in 2-D shapes and the environment	• Recognises and describes symmetry in 2-D shapes and the environment • Creates or completes symmetrical pictures and shapes (using only horizontal or vertical lines of symmetry)	• Recognises and describes symmetry in 2-D shapes and the environment • Creates or completes symmetrical pictures and shapes	

Data Handling

	Grade R	Grade 1	Grade 2	Grade 3	
Collecting	• Collects physical objects in the classroom and school environment according to given criteria/categories	• Collects everyday objects in the classroom and school environment according to given criteria/categories	• Collects data in the classroom and school environment to answer questions posed by the teacher	• Collects data in the classroom and school environment to answer questions posed by the teacher and the class	
Sorting and organising	• Sorts physical objects according to one attribute	• Sorts physical objects according to one attribute chosen for a reason • Gives reasons for collections being sorted in particular ways	• Sorts physical objects according to one attribute chosen by the teacher • Gives reasons for collections being sorted in particular ways	• Sorts, orders and organises own and supplied data by one or more attributes for a particular reason • Gives reasons for collections being sorted in particular ways	
Representing	• Constructs physical graphs • Draws a picture as a record of collected objects	• Constructs physical graphs • Draws a picture as a record of collected objects • Constructs pictograms where a sticker or stamp represents one element in a collection of objects	• Draws pictograms that have a 1-1 correspondence between own data and representations	• Draws pictograms and bar graphs that have a 1-1 correspondence between own data and representations	
Analysing and answering questions	• Answers questions (e.g. Which has the most?) based on their picture or their sorted objects	• Describes their collection of objects, explains how it was sorted and answers questions about it	• Describes his/her own or a peer's collection of objects, explains how it was sorted and answers questions about it	• Reads, interprets and reports on information in own and peer's representations of data • Reads and interprets data presented in simple tables and lists	

Measurement						
		Grade R	Grade 1	Grade 2	Grade 3	

	Time	• Describes events in terms of the time of day (e.g. early, late morning, afternoon or night) or days (e.g. yesterday, today, tomorrow and days of the week)
		• Sequences events (e.g. before, after, at the same time)
		• Compares events in terms of duration (e.g. longer, shorter)
			• Describes events in terms of the time of day (e.g. early, late morning, afternoon, night, hours of the day [for known events, e.g. school starts at 8 o'clock]) and days (e.g. yesterday, today, tomorrow and days of the week)
			• Sequences events (e.g. before, after, at the same time, days of the week)
			• Compares events in terms of duration (e.g. longer, shorter)
			• Reads analogue and digital clock time in hours and minutes
				• Describes events in terms of the time of day (e.g. early, late morning, afternoon, night, hours of the day [for known events, e.g. school starts at 8 o'clock]) and days (e.g. yesterday, today, tomorrow and days of the week)
				• Sequences events (e.g. before, after, at the same time, days of the week, months of the year)
				• Compares events in terms of duration (e.g. longer, shorter)
				• Reads analogue and digital clock time in terms of hours, half-hours, quarters of an hour and minutes
				• Calculates elapsed time in:
				  • hours and minutes using clocks
				  • days, weeks and months using calendars
					• Reads analogue and digital clock time in terms of hours, half-hours, quarters of an hour and minutes
					• Calculates elapsed time in:
					  • hours and minutes using clocks
					  • days, weeks and months using calendars
					• Solves problems involving calculations with and conversions between:
					  • minutes ↔ hours
					  • hours ↔ days
					  • days ↔ months	

	Length (including perimeter)	• Compares pairs of objects in terms of length by **direct comparison** using appropriate language (e.g. longer, taller, shorter, the same as)	• Compares pairs of objects in terms of length by **direct comparison** using appropriate language (e.g. longer, taller, shorter, the same as) • Compares and orders objects in terms of length by **indirect comparison**	• Compares and orders objects in terms of length by **indirect comparison** • Compares and orders objects in terms of length by **indirect comparison** using **non-standard measures** (e.g. matches, sticks, drinking straws, pieces of string, hand spans, footsteps, bicycle wheel revolutions)	• Compares and orders objects in terms of length by **indirect comparison** using **non-standard measures** (e.g. matches, sticks, drinking straws, pieces of string, hand spans, footsteps, bicycle wheel revolutions) • Compares and orders objects in terms of length **by indirect comparison** using **standard measuring instruments** (e.g. rulers, metre sticks, tape measures and trundle wheels etc.) and corresponding units (e.g. centimetres and metres)	
	Mass	• Compares pairs of objects in terms of mass by **direct comparison** using appropriate language (e.g. lighter, heavier, the same as)	• Compares pairs of objects in terms of mass by **direct comparison** using appropriate language (e.g. lighter, heavier, the same as) • Compares and orders objects in terms of mass by **indirect comparison**	• Compares and orders objects in terms of mass by **indirect comparison** • Compares and orders objects in terms of mass by **indirect comparison** using **non-standard measures** (e.g. stones, bottle tops, blocks, bricks, sand bags)	• Compares and orders objects in terms of mass by **indirect comparison** using **non-standard measures** (e.g. stones, bottle tops, blocks, bricks, sand bags) • Compares and orders objects in terms of mass **by indirect comparison** using **standard measuring instruments** (e.g. scales) and corresponding units (e.g. grams and kilograms)	
	Capacity and volume	• Compares pairs of objects in terms of capacity/volume by **direct comparison** using appropriate language (e.g. more, less, bigger, smaller, the same as)	• Compares pairs of objects in terms of capacity/volume by **direct comparison** using appropriate language (e.g. more, less, bigger, smaller, the same as) • Compares and orders objects in terms of capacity/volume by **indirect comparison**	• Compares and orders objects in terms of capacity/volume by **indirect comparison** • Compares and orders objects in terms of capacity/volume by **indirect comparison** using **non-standard measures** (e.g. stones, bottle tops, blocks, cups of sand/water etc.)	• Compares and orders objects in terms of capacity by **indirect comparison** using **non-standard measures** (e.g. stones, bottle tops, blocks, cups of sand/water etc.) • Compares and orders objects in terms of capacity/volume **by indirect comparison** using **standard measuring instruments** (e.g. measuring spoons, cups and jugs.) and corresponding units (e.g. litres and millilitres) • Compares and orders objects in terms of volume by indirect comparison using non-standard measures (e.g. displacement in water)	
	Area				• Compares pairs of objects in terms of area by **direct comparison** using appropriate language (e.g. bigger, smaller, the same as)	