Mathletics

New Brunswick Program of Studies

Understanding Practice and Fluency (UPF)

Grades 1 – 2

November, 2021

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Grade 1

1 Number

1.1 Develop number sense

Outcome	Quests	Content
1. Say the number sequence, 0 to 100, by: 1s forward and backward between any two given numbers; 2s to 20, forward starting at 0; 5s and 10s to 100, forward starting at 0.	Number sequences to 100	Counting by 1s to 100
		Skip counting by 2s to 20
		Skip counting by 5s to 100
		Skip counting by 10s to 100
		Skip counting by 2s, 5s & 10s
3. Demonstrate an understanding of counting by: indicating that the last number said identifies “how many”; showing that any set has only one count; using the counting on strategy; using parts or equal groups to count sets.	Counting strategies	Counting collections to 20
4. Represent and describe numbers to 20 concretely, pictorially and symbolically.	Represent & describe numbers to 20	Number names to 20
		Sequencing numbers to 20
		Partitioning numbers to 20
5. Compare sets containing up to 20 elements to solve problems using: referents and one-to-one correspondence.	Compare & order sets up to 20	Comparing & ordering sets up to 20
		Exploring change in quantity up to 20
7. Demonstrate, concretely and pictorially, how a given number can be represented by a variety of equal groups with and without singles.	Represent numbers to 20	Representing numbers to 20 in equal groups
8. Identify the number, up to 20, that is one more, two more, one less and two less than a given number.	Numbers more than & less than	Numbers more than & less than
9. Demonstrate an understanding of addition of numbers with answers to 20 and their corresponding subtraction facts, concretely, pictorially and symbolically by: using familiar and mathematical language to describe additive and subtractive actions from their experience; creating and solving problems in context that involve addition and	Addition & subtraction to 20	Adding to 20
		Adding to 20 by bridging to 10
		Subtracting within 20
		Subtracting within 20 by bridging to 10
		Adding & subtracting using a bar model
		Creating addition & subtraction word problems
		Finding fact families for addition & subtraction

subtraction; modeling addition and subtraction using a variety of concrete and visual representations, and recording the process symbolically.		
10. Describe and use mental mathematics strategies (memorization not intended), such as: counting on and counting back; making 10; doubles; using addition to subtract to determine the basic addition facts to 18 and related subtraction facts.	Addition & subtraction strategies	Making a 10
		Adding & subtracting to 18
		Adding & subtracting using doubles
		Introducing commutative property of addition

2 Patterns and Relations (Patterns)

2.1 Use patterns to describe the world and to solve problems

Outcome	Quests	Content
1. Demonstrate an understanding of repeating patterns (two to four elements) by: describing, reproducing, extending and creating patterns using manipulatives, diagrams, sounds and actions.	Repeating patterns	Recognizing repeating patterns
		Reproducing repeating patterns
		Manipulating repeating patterns
		Extending repeating patterns
		Replicating repeating patterns
		Describing & creating repeating patterns
2. Translate repeating patterns from one representation to another.	Translate repeating patterns	Translating repeating patterns

3 Patterns and Relations (Variables and Equations)

3.1 Represent algebraic expressions in multiple ways

Outcome	Quests	Content
3. Describe equality as a balance and inequality as an imbalance, concretely and pictorially (0 to 20).	Equality & inequality	Exploring equality & inequality
4. Record equalities using the equal symbol.	Record equalities	Recording equalities
		Solving addition & subtraction equality problems

4 Shape and Space (Measurement)

4.1 Use direct and indirect measurement to solve problems

Outcome	Quests	Content
1. Demonstrate an understanding of measurement as a process of comparing by: identifying attributes that can be compared; ordering objects; making statements of comparison; filling, covering or matching.	Measurement	Exploring length
		Exploring volume
		Exploring mass
		Exploring area

5 Shape and Space (3-D Objects and 2-D Shapes)

5.1 Describe the characteristics of 3-D objects and 2-D shapes, and analyze the relationships among them

Outcome	Quests	Content
2. Sort 3-D objects and 2-D shapes using one attribute, and explain the sorting rule.	Sort 2-D shapes & 3-D objects	Sorting 2-D shapes
		Sorting 3-D objects
3. Replicate composite 2-D shapes and 3-D objects.	Replicate composite 2-D shapes	Replicating composite 2-D shapes
	Replicate composite 3-D objects	Replicating composite 3-D objects
4. Compare 2-D shapes to parts of 3-D objects in the environment.	Compare 2-D shapes to 3-D objects	Comparing 2-D shapes to parts of 3-D objects

Grade 2

1 Number

1.1 Develop number sense

Outcome	Quests	Content
1. Say the number sequence, 0 to 100, by: 2s, 5s and 10s, forward and backward, using starting points that are multiples of 2, 5 and 10 respectively; 10s using starting points from 1 to 9; 2s starting from 1.	Number sequences	Counting by 2s to 100
		Counting by 2s to 100 from any number
		Counting by 5s to 100
		Counting by 10s to 100
		Counting by 10s to 100 from any number
		Counting in 2s, 5s or 10s
		Counting a sum of money to 100¢
2. Demonstrate if a number (up to 100) is even or odd.	Even & odd numbers	Even & odd numbers
3. Describe order or relative position using ordinal numbers (up to tenth).	Ordinal numbers	Introducing ordinal numbers
4. Represent and describe numbers to 100, concretely, pictorially and symbolically.	Numbers to 100	Number names to 100
		Counting collections to 50
		Counting to 100
		Numbers to 100 using a tally
		Using coins to represent numbers to 100
5. Compare and order numbers up to 100.	Compare & order numbers to 100	Comparing & ordering numbers to 100
		Identifying numbers before & after up to 100
7. Illustrate, concretely and pictorially, the meaning of place value for numerals to 100.	Place value partitioning up to 100	Place value partitioning of numbers to 50
		Non-standard partitioning of numbers to 100
	Solve 2-digit place value problems	Solving place value problems with 2-digit numbers
8. Demonstrate and explain the effect of adding zero to or subtracting zero from any number.	Add & subtract a zero	Adding & subtracting a zero
9. Demonstrate an understanding of addition (limited to 1 and 2-digit numerals) with answers to 100 and the corresponding subtraction by:	Addition to 100	Adding 2-digit & 1-digit numbers using place value
		Adding by bridging to 10 with 2 & 1-digit numbers

using personal strategies for adding and subtracting with and without the support of manipulatives; creating and solving problems that involve addition and subtraction; explaining that the order in which numbers are added does not affect the sum; explaining that the order in which numbers are subtracted may affect the difference.		Adding tens to a 2-digit number using models
		Adding two 2-digit numbers using place value
		Adding two 2-digit numbers using a number line
		Adding by compensating
		Adding using compatible numbers
		Using number bonds to 100
	Subtraction within 100	Subtracting by bridging to 10
		Subtracting 2 & 1-digit numbers using place value
		Subtracting using mixed strategies
		Subtracting tens from a 2-digit number
		Subtracting two 2-digit numbers using place value
		Subtracting two 2-digit numbers, number line
		Subtracting by compensating
	Addition & subtraction within 100	Adding up to find the difference
		Add/subtract place value patterns
		Add/subtract using mixed strategies
		Add/subtract two 2-digit numbers using place value
		Solving addition & subtraction word problems
		Number sentences to solve word problems
		Estimating sums & differences
		Judging the reasonableness of answers
10. Apply mental mathematics strategies, such as: using doubles; making 10; one more, one less; two more, two less; building on a known double; addition for subtraction to determine basic addition facts to 18 and related subtraction facts.	Addition & subtraction to 18	Addition & subtraction to 18
		Adding using doubles
		Subtracting using doubles
		Adding doubles or near doubles
		Finding fact families for addition & subtraction
		Using the commutative property of addition
		Counting on by bridging to 10
		Addition & subtraction facts — word problems

2 Patterns and Relations (Patterns)

2.1 Use patterns to describe the world and to solve problems

Outcome	Quests	Content
1. Demonstrate an understanding of repeating patterns (three to five elements).	Explore repeating patterns	Creating & extending repeating patterns
		Identifying repeating patterns
		Numeric patterns
2. Demonstrate an understanding of increasing patterns (for PR1 and PR2) by: describing, extending, comparing; creating patterns using manipulatives, diagrams, sounds and actions (numbers to 100).	Explore increasing number patterns	Exploring addition & subtraction patterns to 100
		Exploring patterns to 100 using multiples
		Connecting objects & symbols to number patterns
		Exploring growing number patterns up to 100
		Exploring visual patterns

3 Patterns and Relations (Variables and Equations)

3.1 Represent algebraic expressions in multiple ways

Outcome	Quests	Content
3. Demonstrate and explain the meaning of equality and inequality by using manipulatives and diagrams (0 to 100).	Equality & inequality	Introducing equality & inequality
4. Record equalities and inequalities symbolically using the equal symbol or the not equal symbol.	Use the equal & not-equal symbols	Using the equal & not-equal symbols

4 Shape and Space (Measurement)

4.1 Use direct and indirect measurement to solve problems

Outcome	Quests	Content
1. Relate the number of days to a week and the number of months to a year in a problem-solving context.	Explore the passing of time	Calendars
		Days of the week & months of the year
2. Relate the size of a unit of measure to the number of units (limited to nonstandard units) used to measure length and mass (weight).	Non-standard measurement	Non-standard measurement of length
		Non-standard measurement of mass
3. Compare and order objects by length, height, distance around and mass (weight) using nonstandard units, and make statements of comparison.	Compare & order objects	Comparing & ordering objects by length
		Comparing & ordering objects by mass
4. Measure length to the nearest non-standard unit by: using multiple copies of a unit or using a single copy of a unit (iteration process).	Measure length using non-standard units	Measuring length using non-standard units

5 Shape and Space (3-D Objects and 2-D Shapes)

5.1 Describe the characteristics of 3-D objects and 2-D shapes, and analyze the relationships among them

Outcome	Quests	Content
6. Sort 2-D shapes and 3-D objects using two attributes, and explain the sorting rule.	Sort 2-D shapes & 3-D objects	Sorting 2-D shapes
		Sorting 3-D objects
7. Describe, compare and construct 3-D objects, including: cubes, spheres, cones, cylinders and pyramids.	Introduce 3-D objects	Introducing spheres
		Introducing cones
		Introducing cubes
		Introducing cylinders
		Introducing pyramids
		Introducing prisms
		Identifying 3-D objects
		Identifying attributes of 3-D objects
		Comparing 3-D objects
8. Describe, compare and construct 2-D shapes, including: triangles, squares, rectangles and circles.	Identify and compare 2-D shapes	Naming 2-D shapes
		Comparing 2-D shapes
9. Identify 2-D shapes as parts of 3-D objects in the environment.	Identify 2-D shapes in the environment	Identifying 2-D shapes in the environment

6 Statistics and Probability (Data Analysis)

6.1 Collect, display, and analyze data to solve problems

Outcome	Quests	Content
1. Gather and record data about self and others to answer questions.	Gather & record data	Gathering & recording data
2. Construct and interpret concrete graphs and pictographs to solve problems.	Interpret data	Using pictographs
		Using basic graphs
		Using a tally
		Making a graph
		Answering questions about a graph

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