# Mathletics
## Alberta Program of Studies
## Skill Quests

**Grades 1 – 2**

May, 2022

Mathletics

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Skill Quests
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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 between any two given numbers, 1s backward from 20 to 0, 2s forward from 0 to 20, 5s and 10s forward from 0 to 100. | 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, using parts or equal groups to count sets. | Counting strategies | Counting collections to 20 |
| | | Counting collections to 50 |
| | | Counting collections to 100 |
| 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, using: referents, one-to-one correspondence to solve problems. | Compare & order sets up to 20 | Comparing & ordering sets up to 20 |
| | | Exploring change in quantity up to 20 |
| 7. Demonstrate an understanding of conservation of number. | Understand the conservation of number | Understanding the conservation of number |
| 8. Identify the number, up to 20, that is: one more, two more, one less, 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 mathematical language to describe additive and subtractive actions, creating and solving problems in context that involve addition and subtraction, modelling addition and subtraction, using a variety of concrete and visual | 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 |
| | | Adding & subtracting within 20 fluently |

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| representations, and recording the process symbolically. | | |
| 10. Describe and use mental mathematics strategies for basic addition facts and related subtraction facts to 18. | 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, creating patterns using manipulatives, diagrams, sounds and actions. | Repeating patterns | Recognizing repeating patterns |
| | | Reproducing repeating patterns |
| | | Manipulating repeating patterns |
| | | Extending repeating patterns |
| | | Describing & creating repeating patterns |
| 2. Translate repeating patterns from one representation to another. | Translate repeating patterns | Translating repeating patterns |
| 3. Sort objects, using one attribute, and explain the sorting rule. | Sort objects using 1 attribute | Sorting objects using 1 attribute |

# 3 Patterns and Relations (Variables and Equations)

## 3.1 Represent algebraic expressions in multiple ways

| Outcome | Quests | Content |
|---|---|---|
| 4. Describe equality as a balance and inequality as an imbalance, concretely and pictorially (0 to 20). | Equality & inequality | Exploring equality & inequality |
| 5. 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 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 |

# 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) by: describing, extending, comparing, creating patterns using manipulatives, diagrams, sounds and actions. | Explore repeating patterns | Creating & extending repeating patterns |
| | | Identifying repeating patterns |
| | | Numeric patterns |
| 2. Demonstrate an understanding of increasing patterns by: describing, reproducing, extending, creating numerical (numbers to 100) and non-numerical patterns using manipulatives, diagrams, sounds and actions. | Explore increasing number patterns | Exploring add/sub 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. Sort a set of objects, using two attributes, and explain the sorting rule. | Sort objects using 2 attributes | Sorting objects using 2 attributes |
| 7. Illustrate, concretely and pictorially, the meaning of place value for numerals to 100. | Place value of numbers to 100 | Standard partitioning of numbers to 100 |
| | | Non-standard partitioning of numbers to 100 |
| | Place value problems: 2-digit numbers | 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: using personal strategies for adding and subtracting with and without the support of manipulatives, creating and solving problems that involve addition and subtraction, using the commutative property of addition (the order in which numbers are added does not affect the sum), using the associative property of addition(grouping a set of numbers | Addition within 100 | Adding 2-digit & 1-digit numbers using place value |
| | | Adding by bridging to 10 with 2- & 1-digit numbers |
| | | 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 |

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| in different ways does not affect the sum), explaining that the order in which numbers are subtracted may affect the difference. | | 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 for basic addition facts and related subtraction facts to 18. | 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 |

# 3 Patterns and Relations (Variables and Equations)

## 3.1 Represent algebraic expressions in multiple ways

| Outcome | Quests | Content |
|---------|--------|---------|
| 4. Demonstrate and explain the meaning of equality and inequality, concretely and pictorially. | Equality & inequality | Introducing equality & inequality |
| 5. Record equalities and inequalities symbolically, using the equal symbol or the not equal symbol. | Use the equal & not-equal symbol | Using the equal & not-equal symbol |

# 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 nonstandard unit by: using multiple copies of a unit, 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 shape, 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, pyramids. | 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, circles. | 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, sorting & 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 |

**Mathletics**

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