

Appendix A

Outcomes by Strand

(with page references)

[C]	Communication	[PS]	Problem Solving
[CN]	Connections	[R]	Reasoning
[ME]	Mental Mathematics and Estimation	[T]	Technology
		[V]	Visualization

Strand: Number	General Outcome: Develop number sense
Specific Outcomes <i>It is expected that students will:</i>	Achievement Indicators <i>The following set of indicators help determine whether students have met the corresponding specific outcome:</i>
<p>3N1 Say the number sequence 0 to 1000 forward and backward by:</p> <ul style="list-style-type: none"> • 5s, 10s or 100s, using any starting point • 3s, using starting points that are multiples of 3 • 4s, using starting points that are multiples of 4 • 25s, using starting points that are multiples of 25. <p>[C, CN, ME] (pp. 110-119)</p>	<p>3N1.1 Extend a given skip counting sequence by 5s, 10s or 100s, forward and backward, using a given starting point.</p> <p>3N1.2 Extend a given skip counting sequence by 25s, forward and backward, starting at a given multiple of 25.</p> <p>3N1.3 Identify and correct errors and omissions in a given skip counting sequence.</p> <p>3N1.4 Identify and explain the skip counting pattern for a given number sequence.</p> <p>3N1.5 Determine the value of a given set of coins (nickels, dimes, quarters, loonies) by using skip counting.</p> <p>3N1.6 Extend a given skip counting sequence by 3s, forward and backward, starting at a given multiple of 3.</p> <p>3N1.7 Extend a given skip counting sequence by 4s, forward and backward, starting at a given multiple of 4.</p>
<p>3N2 Represent and describe numbers to 1000, concretely, pictorially and symbolically.</p> <p>[C, CN, V] (pp. 86-87, 90-97, 100-105, 122-123)</p>	<p>3N2.1 Represent a given number pictorially.</p> <p>3N2.2 Read a given number word (0 to 1000).</p> <p>3N2.3 Read a given three-digit numeral without using the word and; e.g., 321 is three hundred twenty one, NOT three hundred AND twenty-one.</p> <p>3N2.4 Represent a given number as an expression; e.g., 300 – 44 for 256 or 20 + 236.</p> <p>3N2.5 Represent a given number, using manipulatives such as base ten materials.</p> <p>3N2.6 Write number words for given multiples of ten to 90.</p> <p>3N 2.7 Write number words for given multiples of a hundred to 900.</p>

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Strand: Number (Continued)	General Outcome: Develop number sense
Specific Outcomes <i>It is expected that students will:</i>	Achievement Indicators <i>The following set of indicators help determine whether students have met the corresponding specific outcome:</i>
<p>3N3 Compare and order numbers to 1000. [C, CN, R, V] (pp. 106-109)</p>	<p>3N3.1 Place a given set of numbers in ascending or descending order, and verify the result by using a hundred chart (e.g., a one hundred chart, a two hundred chart, a three hundred chart), a number line or by making references to place value.</p> <p>3N3.2 Create as many different 3-digit numerals as possible, given three different digits. Place the numbers in ascending or descending order.</p> <p>3N3.3 Identify and explain errors in a given ordered sequence (e.g., using a two hundred / three hundred chart).</p> <p>3N3.4 Identify missing numbers in parts of a given hundred sequence (e.g., using a two hundred / three hundred chart).</p> <p>3N3.5 Identify errors in a given hundred chart (e.g., using a two hundred / three hundred chart).</p>
<p>3N4 Estimate quantities less than 1000, using referents. [ME, PS, R, V] (pp. 120-123)</p>	<p>3N4.1 Estimate the number of groups of ten in a given quantity, using 10 as a referent (known quantity).</p> <p>3N4.2 Estimate the number of groups of a hundred in a given quantity, using 100 as a referent.</p> <p>3N4.3 Estimate a given quantity by comparing it to a referent.</p> <p>3N4.4 Select an estimate for a given quantity by choosing among three possible choices.</p> <p>3N4.5 Select and justify a referent for determining an estimate for a given quantity.</p>
<p>3N5 Illustrate, concretely and pictorially, the meaning of place value for numerals to 1000. [C, CN, R, V] (pp. 88-89, 96-105, 116-117)</p>	<p>3N5.1 Explain and show, with counters, the meaning of each digit for a given 3-digit numeral with all digits the same; e.g., for the numeral 222, the first digit represents two hundreds (two hundred counters) the second digit represents two tens (twenty counters) and the third digit represents two ones (two counters).</p> <p>3N5.2 Explain, using concrete materials, the meaning of zero as a place holder in a given number.</p> <p>3N5.3 Record, in more than one way, the number represented by given proportional materials (e.g., base-ten materials) and non-proportional materials (e.g., money).</p> <p>3N5.4 Represent a given number in different ways, using proportional and non-proportional materials, and explain how the representations are equivalent; e.g., 351 can be represented as three 100s, five 10s and one 1; or two 100s, fifteen 10s and one 1; or three 100s, four 10s and eleven 1s.</p>

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Strand: Number	General Outcome: Develop number sense
Specific Outcomes <i>It is expected that students will:</i>	Achievement Indicators <i>The following set of indicators help determine whether students have met the corresponding specific outcome:</i>
<p>3N6 Describe and apply mental mathematics strategies for adding two 2-digit numerals, such as:</p> <ul style="list-style-type: none"> • adding from left to right • taking one addend to the nearest multiple of ten and then compensating • using doubles. <p>[C, CN, ME, PS, R, V] (pp.182-185)</p>	<p>3N6.1 Add two given 2-digit numerals, using a mental mathematics strategy, and explain or illustrate the strategy.</p> <p>3N6.2 Explain how to use the “adding from left to right” strategy; e.g., to determine the sum of $23 + 46$, think $20 + 40$ and $3 + 6$.</p> <p>3N6.3 Explain how to use the “taking one addend to the nearest multiple of ten and then compensating” strategy; e.g., to determine the sum of $28 + 47$, think $30 + 47 - 2$ or $50 + 28 - 3$.</p> <p>3N6.4 Explain how to use the “using doubles” strategy; e.g., to determine the sum of $24 + 26$, think $25 + 25$; to determine the sum of $25 + 26$, think $25 + 25 + 1$ or doubles plus 1.</p> <p>3N6.5 Apply a mental mathematics strategy for adding two given 2-digit numerals.</p>
<p>3N7 Describe and apply mental mathematics strategies for subtracting two 2-digit numerals, such as:</p> <ul style="list-style-type: none"> • taking the subtrahend to the nearest multiple of ten and then compensating • think addition • using doubles. <p>[C, CN, ME, PS, R, V] (pp.194-197)</p>	<p>3N7.1 Subtract two given 2-digit numerals, using a mental mathematics strategy, and explain or model the strategy used.</p> <p>3N7.2 Explain how to use the “taking the subtrahend to the nearest multiple of ten and then compensating” strategy; e.g., to determine the difference of $48 - 19$, think $48 - 20 + 1$.</p> <p>3N7.3 Explain how to use the “think addition” strategy; e.g., to determine the difference of $62 - 45$, think $45 + 5$, then $50 + 12$ and then $5 + 12$.</p> <p>3N7.4 Explain how to use the “using doubles” strategy; e.g., to determine the difference of $24 - 12$, think $12 + 12 = 24$.</p> <p>3N7.5 Apply a mental mathematics strategy for subtracting two given 2-digit numerals.</p>
<p>3N8 Apply estimation strategies to predict sums and differences of two 2-digit numerals in a problem solving context.</p> <p>[C, ME, PS, R] (pp. 174-175, 190-191)</p>	<p>3N8.1 Estimate the solution for a given problem involving the sum of two 2-digit numerals; e.g., to estimate the sum of $43 + 56$, use $40 + 50$ (the sum is close to 90).</p> <p>3N8.2 Estimate the solution for a given problem involving the difference of two 2-digit numerals; e.g., to estimate the difference of $56 - 23$, use $50 - 20$ (the difference is close to 30).</p>

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Strand: Number (Continued)	General Outcome: Develop number sense
Specific Outcomes <i>It is expected that students will:</i>	Achievement Indicators <i>The following set of indicators help determine whether students have met the corresponding specific outcome:</i>
<p>3N9 Demonstrate an understanding of addition and subtraction of numbers with answers to 1000 (limited to 1-, 2- and 3-digit numerals), concretely, pictorially and symbolically, by:</p> <ul style="list-style-type: none"> • using personal strategies for adding and subtracting with and without the support of manipulatives • creating and solving problems in context that involve addition and subtraction of numbers. <p>[C, CN, ME, PS, R, V] (pp. 176-181, 186-189, 192-194, 198-201)</p>	<p>N9.1 Model the addition of two or more given numbers, using concrete or visual representations, and record the process symbolically.</p> <p>N9.2 Create an addition or subtraction story problem for a given solution.</p> <p>N9.3 Determine the sum of two given numbers, using a personal strategy; e.g., for $326 + 48$, record $300 + 60 + 14$.</p> <p>N9.4 Refine personal strategies to increase their efficiency.</p> <p>N9.5 Solve a given problem involving the sum or difference of two given numbers.</p> <p>N9.6 Model the subtraction of two given numbers, using concrete or visual representations, and record the process symbolically.</p> <p>N9.7 Determine the difference of two given numbers, using a personal strategy; e.g., for $127 - 38$, record $38 + 2 + 80 + 7$ or $127 - 20 - 10 - 8$.</p>
<p>3N10 Apply mental mathematics strategies, such as:</p> <ol style="list-style-type: none"> 1. Using Doubles 2. Making 10 3. Using addition to subtract 4. Using the Commutative Property 5. Using the Property of Zero <p>for basic addition facts to 18 and related subtraction facts.</p> <p>[C, CN, ME, PS, R, V] (pp. 152-163)</p>	<p>3N10.1 Explain or demonstrate the mental mathematics strategy that could be used to determine a basic fact, such as:</p> <ol style="list-style-type: none"> 1.1 Using doubles; e.g., for $6 + 8$, think $7 + 7$ 1.2 Using doubles plus one, plus two; e.g., for $6 + 7$, think $6 + 6 + 1$ 1.3 Using doubles subtract one, subtract two; e.g., for $6 + 7$, think $7 + 7 - 1$ 2.1 Making 10; e.g., for $6 + 8$, think $6 + 4 + 4$ or $8 + 2 + 4$ 3.1 Using addition to subtract; e.g., for $13 - 7$, think $7 + ? = 13$. 4.1 Using commutative property; e.g., for $3 + 9$, think $9 + 3$ 5.1 Provide a rule for determining answers when adding and subtracting zero. When you add or subtract 0 to or from a number, the answer is the number you started with. <p>3N10.2 Recall doubles to 18 and related subtraction facts</p> <p>3N10.3 Recall compatible number pairs for 5 and 10</p> <p>3N10.4 Recall basic addition facts to 18 and related subtraction facts to solve problems.</p>

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Strand: Number (Continued)	General Outcome: Develop number sense
Specific Outcomes <i>It is expected that students will:</i>	Achievement Indicators <i>The following set of indicators help determine whether students have met the corresponding specific outcome:</i>
<p>3N11 Demonstrate an understanding of multiplication to 5×5 by:</p> <ul style="list-style-type: none"> representing and explaining multiplication using equal grouping and arrays creating and solving problems in context that involve multiplication modelling multiplication using concrete and visual representations, and recording the process symbolically relating multiplication to repeated addition relating multiplication to division. <p>[C, CN, PS, R] (pp.240-255, 266-271)</p>	<p>(It is not expected that students recall the basic facts.)</p> <p>3N11.1 Identify events from experience that can be described as multiplication.</p> <p>3N11.2 Represent a given story problem, using manipulatives or diagrams, and record the problem in a number sentence.</p> <p>3N11.3 Solve a given multiplication problem.</p> <p>3N11.4 Create and illustrate a story problem for a given number sentence</p> <p>3N11.5 Represent, concretely or pictorially, equal groups for a given number sentence.</p> <p>3N11.6 Represent a given multiplication expression as repeated addition.</p> <p>3N11.7 Represent a given repeated addition as multiplication.</p> <p>3N11.8 Represent a given multiplication expression, using an array.</p> <p>3N11.9 Create an array to model the commutative property of multiplication.</p> <p>3N11.10 Relate multiplication to division by using arrays and writing related number sentences.</p>
<p>3N12 Demonstrate an understanding of division (limited to division related to multiplication facts up to 5×5) by:</p> <ul style="list-style-type: none"> representing and explaining division using equal sharing and equal grouping creating and solving problems in context that involve equal sharing and equal grouping modelling equal sharing and equal grouping using concrete and visual representations, and recording the process symbolically relating division to repeated subtraction relating division to multiplication. <p>[C, CN, PS, R] (pp.256-271)</p>	<p>3N12.1 Identify events from experience that can be described as equal grouping.</p> <p>3N12.2 Illustrate, with counters or a diagram, a given story problem, presented orally, that involves equal grouping; and solve the problem.</p> <p>3N12.3 Listen to a story problem; represent the numbers, using manipulatives or a drawing; and record the problem with a number sentence.</p> <p>3N12.4 Create and illustrate, with counters, a story problem for a given number sentence; e.g., $6 \div 3 = 2$.</p> <p>3N12.5 Solve a given problem involving division.</p> <p>3N12.6 Identify events from experience that can be described as equal sharing.</p> <p>3N12.7 Illustrate, with counters or a diagram, a given story problem, presented orally, that involves equal sharing; and solve the problem.</p> <p>3N12.8 Represent a given division expression as repeated subtraction.</p> <p>3N12.9 Represent a given repeated subtraction as a division expression.</p> <p>3N12.10 Relate division to multiplication by using arrays and writing related number sentences.</p>

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Specific Outcomes <i>It is expected that students will:</i>	Achievement Indicators <i>The following set of indicators help determine whether students have met the corresponding specific outcome:</i>
<p>3N13 Demonstrate an understanding of fractions by:</p> <ul style="list-style-type: none"> explaining that a fraction represents a part of a whole describing situations in which fractions are used comparing fractions of the same whole that have like denominators. <p>[C, CN, ME, R, V] (pp.276-289)</p>	<p>3N13.1 Describe everyday situations where fractions are used.</p> <p>3N13.2 Cut or fold a whole into equal parts, or draw a whole in equal parts; demonstrate that the parts are equal; and name the parts.</p> <p>3N13.3 Sort a given set of shaded regions into those that represent equal parts and those that do not, and explain the sorting.</p> <p>3N13.4 Represent a given fraction concretely or pictorially.</p> <p>3N13.5 Identify common characteristics of a given set of fractions.</p> <p>3N13.6 Name and record the fraction represented by the shaded and non-shaded parts of a given region.</p> <p>3N13.7 Identify the numerator and denominator for a given fraction.</p> <p>3N13.8 Model and explain the meaning of numerator and denominator.</p> <p>3N13.9 Compare given fractions with the same denominator, using models.</p>

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Strand: Patterns and Relations (Patterns)	General Outcome: Use patterns to describe the world and to solve problems.
Specific Outcomes <i>It is expected that students will:</i>	Achievement Indicators <i>The following set of indicators help determine whether students have met the corresponding specific outcome:</i>
<p>3PR1 Demonstrate an understanding of increasing patterns by:</p> <ul style="list-style-type: none"> • describing • extending • comparing • creating <p>patterns using manipulatives, diagrams, sounds and actions (numbers to 1000).</p> <p>[C, CN, PS, R, V]</p> <p><i>(pp. 34-63)</i></p>	<p>3PR1.1 Describe a given increasing pattern by stating a pattern rule that includes the starting point and a description of how the pattern continues; e.g., for 42, 44, 46 ... the pattern rule is start at 42 and add 2 each time.</p> <p>3PR1.2 Identify the pattern rule of a given increasing pattern, and extend the pattern for the next three terms.</p> <p>3PR1.3 Identify and explain errors in a given increasing pattern.</p> <p>3PR1.4 Identify and apply a pattern rule to determine missing elements for a given pattern.</p> <p>3PR1.5 Describe the strategy used to determine missing elements in a given increasing pattern.</p> <p>3PR1.6 Create a concrete, pictorial or symbolic representation of an increasing pattern for a given pattern rule.</p> <p>3PR1.7 Create a concrete, pictorial or symbolic increasing pattern; and describe the relationship, using a pattern rule.</p> <p>3PR1.8 Solve a given problem, using increasing patterns.</p> <p>3PR1.9 Identify and describe increasing patterns in the environment.</p> <p>3PR1.10 Compare numeric patterns of counting by 2s, 5s, 10s, 25s and 100s.</p> <p>3PR1.11 Locate and describe various increasing patterns found on a hundred chart, such as horizontal, vertical and diagonal patterns.</p>
<p>3PR2 Demonstrate an understanding of decreasing patterns by:</p> <ul style="list-style-type: none"> • describing • extending • comparing • creating <p>patterns using manipulatives, diagrams, sounds and actions(numbers to 1000)..</p> <p>[C, CN, PS, R, V]</p> <p><i>(pp.64-81)</i></p>	<p>3PR2.1 Describe a given decreasing pattern by stating a pattern rule that includes the starting point and a description of how the pattern continues.</p> <p>3PR2.2 Identify the pattern rule of a given decreasing pattern, and extend the pattern for the next three terms.</p> <p>3PR2.3 Solve a given problem, using decreasing patterns.</p> <p>3PR2.4 Identify and describe decreasing patterns in the environment.</p> <p>3PR2.5 Compare decreasing numeric patterns of counting backward by 2s, 5s, 10s, 25s and 100s.</p> <p>3PR2.6 Create a concrete, pictorial or symbolic decreasing pattern for a given pattern rule.</p> <p>3PR2.7 Create a concrete, pictorial or symbolic decreasing pattern; and describe the relationship, using a pattern rule.</p> <p>3PR2.8 Identify and describe various decreasing patterns found on a hundred chart, such as horizontal, vertical and diagonal patterns.</p> <p>3PR2.9 Identify and explain errors in a given decreasing pattern.</p> <p>3PR2.10 Identify and apply a pattern rule to determine missing elements for a given pattern.</p> <p>3PR2.11 Describe the strategy used to determine missing elements in a given decreasing pattern.</p>

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Strand: Patterns and Relations (Variables and Equations)	General Outcome: Represent algebraic expressions in multiple ways.
Specific Outcomes <i>It is expected that students will:</i>	Achievement Indicators <i>The following set of indicators help determine whether students have met the corresponding specific outcome:</i>
3PR3 Solve one-step addition and subtraction equations involving a symbol to represent an unknown number. [C, CN, PS, R, V] (pp. 164-173)	3PR3.1 Explain the purpose of the symbol in a given addition or subtraction equation with one unknown 3PR3.2 Create an addition or subtraction equation with one unknown to represent a given combining or separating action. 3PR3.3 Provide an alternative symbol for the unknown in a given addition or subtraction equation. 3PR3.4 Solve a given addition or subtraction equation with one unknown that represents combining or separating actions, using manipulatives 3PR3.5 Solve a given addition or subtraction equation with one unknown, using a variety of strategies, including guess and test. 3PR3.6 Solve a given addition or subtraction equation when the unknown is on the left or the right side of the equation. 3PR3.7 Explain why the unknown in a given addition or subtraction equation has only one value.

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Strand: Shape and Space (Measurement)	General Outcome: Use direct or indirect measurement to solve problems.
Specific Outcomes <i>It is expected that students will:</i>	Achievement Indicators <i>The following set of indicators help determine whether students have met the corresponding specific outcome:</i>
3SS1 Relate the passage of time to common activities, using nonstandard and standard units (minutes, hours, days, weeks, months, years). [CN, ME, R] (pp.294-296)	3SS1.1 Select and use a nonstandard unit of measure, such as television shows or pendulum swings, to measure the passage of time, and explain the choice. 3SS1.2 Identify activities that can or cannot be accomplished in minutes, hours, days, weeks, months and years. 3SS1.3 Provide personal referents for minutes and hours.
3SS2 Relate the number of seconds to a minute, the number of minutes to an hour and the number of days to a month in a problem-solving context. [C, CN, PS, R, V] (pp.296-301)	3SS2.1 Determine the number of days in any given month, using a calendar. 3SS2.2 Solve a given problem involving the number of seconds in a minute, minutes in an hour or days in a given month. 3SS2.3 Create a calendar that includes days of the week, dates and personal events.
3SS3 Demonstrate an understanding of measuring length (cm, m) by: <ul style="list-style-type: none"> selecting and justifying referents for the units cm and m modelling and describing the relationship between the units cm and m estimating length, using referents measuring and recording length, width and height. [C, CN, ME, PS, R, V] (pp.302-309)	3SS3.1 Determine and record the length and width of a given 2-D shape. 3SS3.2 Determine and record the length, width or height of a given 3-D object. 3SS3.3 Draw a line segment of a given length, using a ruler. 3SS3.4 Provide a personal referent for one centimetre, and explain the choice. 3SS3.5 Estimate the length of an object, using personal referents. 3SS3.6 Sketch a line segment of a given length without using a ruler. 3SS3.7 Provide a personal referent for one metre, and explain the choice. 3SS3.8 Match a given standard unit to a given referent. 3SS3.9 Show that 100 cm is equivalent to 1 m by using concrete materials.

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Strand: Shape and Space (Measurement)	General Outcome: Use direct or indirect measurement to solve problems.
Specific Outcomes <i>It is expected that students will:</i>	Achievement Indicators <i>The following set of indicators help determine whether students have met the corresponding specific outcome:</i>
<p>3SS4 Demonstrate an understanding of measuring mass (g, kg) by:</p> <ul style="list-style-type: none"> selecting and justifying referents for the units g and kg modelling and describing the relationship between the units g and kg estimating mass, using referents measuring and recording mass. <p>[C, CN, ME, PS, R, V] (pp.318-323)</p>	<p>3SS4.1 Provide a personal referent for one kilogram, and explain the choice. 3SS4.2 Estimate the mass of a given object, using personal referents. 3SS4.3 Provide a personal referent for one gram, and explain the choice. 3SS4.4 Match a given standard unit to a given referent. 3SS4.5 Explain the relationship between 1000 g and 1 kg, using a model. 3SS4.6 Determine and record the mass of a given 3-D object. 3SS4.7 Measure, using a scale, and record, using the units g and kg, the mass of given everyday objects. 3SS4.8 Provide examples of 3-D objects that have a mass of approximately 1 g, 100 g and 1 kg. 3SS4.9 Determine the mass of two given similar objects with different masses, and explain the results. 3SS4.10 Determine the mass of an object, change its shape, re-measure its mass, and explain the results.</p>
<p>3SS5 Demonstrate an understanding of perimeter of regular and irregular shapes by:</p> <ul style="list-style-type: none"> estimating perimeter, using referents for cm or m measuring and recording perimeter (cm, m) constructing different shapes for a given perimeter (cm, m) to demonstrate that many shapes are possible for a perimeter. <p>[C, ME, PS, R, V] (pp.312-317)</p>	<p>3SS5.1 Measure and record the perimeter of a given regular shape, and explain the strategy used. 3SS5.2 Measure and record the perimeter of a given irregular shape, and explain the strategy used. 3SS5.3 Construct a shape for a given perimeter (cm, m). 3SS5.4 Construct or draw more than one shape for a given perimeter. 3SS5.5 Estimate the perimeter of a given shape (cm, m), using personal referents.</p>

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Strand: Shape and Space (3-D Objects and 2-D Shapes)	General Outcome: Describe the characteristics of 3-D objects and 2-D shapes, and analyze the relationships among them.
Specific Outcomes <i>It is expected that students will:</i>	Achievement Indicators <i>The following set of indicators help determine whether students have met the corresponding specific outcome:</i>
3SS6 Describe 3-D objects according to the shape of the faces and the number of edges and vertices. [C, CN, PS, R, V] (pp.224-235)	3SS6.1 Identify the faces, edges and vertices of given 3-D objects, including cubes, spheres, cones, cylinders, pyramids and prisms. 3SS6.2 Identify the shape of the faces of a given 3-D object. 3SS6.3 Determine the number of faces, edges and vertices of a given 3-D object. 3SS6.4 Sort a given set of 3-D objects according to the number of faces, edges or vertices. 3SS6.5 Construct a skeleton of a given 3-D object, and describe how the skeleton relates to the 3-D object.
3SS7 Sort regular and irregular polygons, including: <ul style="list-style-type: none"> • triangles • quadrilaterals • pentagons • hexagons • octagons according to the number of sides. [C, CN, R, V] (pp.206-221)	3SS7.1 Identify given regular and irregular polygons that have different dimensions. 3SS7.2 Identify given regular and irregular polygons that have different orientations. 3SS7.3 Classify a given set of regular and irregular polygons according to the number of sides.

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Strand: Statistics and Probability (Data Analysis)	General Outcome: Collect, display and analyze data to solve problems.
Specific Outcomes <i>It is expected that students will:</i>	Achievement Indicators <i>The following set of indicators help determine whether students have met the corresponding specific outcome:</i>
3SP1 Collect first-hand data and organize it using: <ul style="list-style-type: none"> tally marks line plots charts lists to answer questions. [C, CN, PS, V] (pp.128-137)	3SP1.1 Record the number of objects in a given set, using tally marks. 3SP1.2 Answer questions using collected data. 3SP1.3 Organize a given set of data, using tally marks, line plots, charts or lists. 3SP1.4 Determine the common attributes of line plots by comparing line plots in a given set. 3SP1.5 Collect and organize data, using tally marks, line plots, charts and lists. 3SP1.6 Answer questions arising from a given line plot, chart or list.
3SP2 Construct, label and interpret bar graphs to solve problems. [C, PS, R, V] (pp.138-147)	3SP2.1 Determine the common attributes, titles and axes of bar graphs by comparing bar graphs in a given set. 3SP2.2 Create a bar graph, labelling the title and axes, to represent a given set of data. 3SP2.3 Draw conclusions from a given bar graph to solve problems. 3SP2.4 Solve problems by constructing and interpreting a bar graph.

REFERENCES

REFERENCES

- Alberta Education. LearnAlberta.ca: Planning Guides K, 1, 4, and 7, 2005-2008.
- American Association for the Advancement of Science [AAAS-Benchmarks]. Benchmark for Science Literacy. New York, NY: Oxford University Press, 1993.
- Banks, J.A. and C.A.M. Banks. Multicultural Education: Issues and Perspectives. Boston: Allyn and Bacon, 1993.
- Black, Paul and Dylan Wiliam. "Inside the Black Box: Raising Standards Through Classroom Assessment." Phi Delta Kappan, 20, October 1998, pp.139-148.
- British Columbia. Ministry of Education. The Primary Program: A Framework for Teaching, 2000.
- Burns, M. (2000). About teaching mathematics: A K-8 resource. Sausalito, CA: Math Solutions Publications
- Caine, Renate Numella and Geoffrey Caine. Making Connections: Teaching and the Human Brain. Menlo Park, CA: Addison-Wesley Publishing Company, 1991.
- Cavanagh, Mary C., Math to Know: A Mathematics Handbook, Nelson Education, 2003
- Computation, Calculators, and Common Sense. May 2005, NCTM.
- Davies, Anne. Making Classroom Assessment Work. British Columbia: Classroom Connections International, Inc., 2000.
- Hoogeboom, Shirley, Get Your Hands on Problem Solving, Grade 3, Ideal, 1998
- Hope, Jack A. et.al. Mental Math in the Primary Grades (p. v). Dale Seymour Publications, 1988.
- National Council of Teachers of Mathematics (NCTM). Curriculum Focal Points for Prekindergarten through Grade 8: A Quest for Coherence. Reston, VA: NCTM, 2006.
- National Council of Teachers of Mathematics (NCTM). Mathematics Assessment Sampler. NCTM 2005
- National Council of Teachers of Mathematics (NCTM). Focus in Grade 3, Teaching with Curriculum Focal Points. Reston, VA: 2009 .
- National Council of Teachers of Mathematics. Principals and Standards for School Mathematics. Reston, VA: The National Council of Teachers of Mathematics, 2000.
- OECD Centre for Educational Research and Innovation. Formative Assessment: Improving Learning in Secondary Classrooms. Paris, France: Organization for Economic Co-operation and Development (OECD) Publishing, 2006.

- Proulx, Jerome. "Making the Transition to Algebraic Thinking: Taking Students' Arithmetic Modes of Reasoning into Account." *Selta-K44*, 1(2006)
- Richardson, K. *Developing Number Concepts Addition and Subtraction Book 2*. Pearson Education, Inc. 1999
- Richardson, K. *Counting comparing and pattern*. Pearson Education, Inc. 1999
- Rubenstein, Rheta N. *Mental Mathematics beyond the Middle School: Why? What? How?* September 2001, Vol. 94, Issue 6, p. 442.
- Shaw, J.M. and Cliatt, M.F.P. (1989). "Developing Measurement Sense." In P.R. Trafton (Ed.), *New Directions for Elementary School Mathematics* (pp. 149–155). Reston, VA: National Council of Teachers of Mathematics.
- Small, M. (2008). *Making Math Meaningful to Canadian Students, K-8*. Toronto, Ontario: Nelson Education Ltd.
- Steen, L.A. (ed.). *On the Shoulders of Giants – New Approaches to Numeracy*. Washington, DC: National Research Council, 1990.
- Stenmark, Jean Kerr and William S. Bush, Editor. *Mathematics Assessment: A Practical Handbook for Grades 3-5*. Reston, VA: National Council of Teachers of Mathematics, Inc., 2001.
- Van de Walle, John A. and Louann H. Lovin. *Teaching Student-Centered Mathematics, Grades K-3*. Boston: Pearson Education, Inc. 2006.
- Van de Walle, John A. and Louann H. Lovin. *Teaching Student-Centered Mathematics, Grades 3-5*. Boston: Pearson Education, Inc. 2006.
- Western and Northern Canadian Protocol (WNCP) for Collaboration in Education. *The Common Curriculum Framework for K-9 Mathematics*, 2006. Reproduced and/or adapted by permission. All rights reserved.