



Mathematics

Illustrative Examples

Kindergarten to Grade 3

GENERAL AND SPECIFIC OUTCOMES WITH ACHIEVEMENT INDICATORS

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

Kindergarten

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 may be used to determine whether students have met the corresponding specific outcome.</i>
1. Say the number sequence 1 to 10 by 1s, starting anywhere from 1 to 10 and from 10 to 1. [C, CN, V]	<ul style="list-style-type: none"> ➤ Name the number that comes after a given number, one to nine. ➤ Name the number that comes before a given number, two to ten. ➤ Recite number names from a given number to a stated number (forward – one to ten, backward – ten to one), using visual aids.
2. Subitize (recognize at a glance) and name familiar arrangements of 1 to 5 objects or dots. [C, CN, ME, V]	<ul style="list-style-type: none"> ➤ Look briefly at a given familiar arrangement of 1 to 5 objects or dots, and identify the number represented without counting. ➤ Identify the number represented by a given dot arrangement on a five frame.
3. Relate a numeral, 1 to 10, to its respective quantity. [CN, R, V]	<ul style="list-style-type: none"> ➤ Construct a set of objects corresponding to a given numeral. ➤ Name the number for a given set of objects. ➤ Hold up the appropriate number of fingers for a given numeral. ➤ Match numerals with their given pictorial representations.
4. Represent and describe numbers 2 to 10, concretely and pictorially. [C, CN, ME, R, V]	<ul style="list-style-type: none"> ➤ Partition a given quantity into two parts, using fingers, counters or other objects, and identify the number of objects in each part. ➤ Show a given number as two parts, using pictures, and name the number of objects in each part.
5. Compare quantities 1 to 10, using one-to-one correspondence. [C, CN, V]	<ul style="list-style-type: none"> ➤ Construct a set to show more than, fewer than or as many as a given set. ➤ Compare two given sets through direct comparison; and describe the sets, using words such as <i>more, fewer, as many as</i> or <i>the same number</i>.

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

Kindergarten

Strand: Patterns and Relations (Patterns)	General Outcome: Use patterns to describe the world and to solve problems.
Specific Outcomes	Achievement Indicators
<i>It is expected that students will:</i>	<i>The following set of indicators may be used to determine whether students have met the corresponding specific outcome.</i>
<p>1. Demonstrate an understanding of repeating patterns (two or three elements) by:</p> <ul style="list-style-type: none"> • identifying • reproducing • extending • creating <p>patterns using manipulatives, sounds and actions. [C, CN, PS, V] [ICT: P2–1.1]</p>	<ul style="list-style-type: none"> ➤ Distinguish between repeating patterns and non-repeating sequences in a given set by identifying the part that repeats. ➤ Copy a given repeating pattern, e.g., actions, sound, colour, size, shape, orientation, and describe the pattern. ➤ Extend a variety of given repeating patterns by two more repetitions. ➤ Create a repeating pattern, using manipulatives, musical instruments or actions, and describe the pattern. ➤ Identify and describe a repeating pattern in the classroom, school and outdoors; e.g., in a familiar song, in a nursery rhyme.
<p>2. Sort a set of objects based on a single attribute, and explain the sorting rule. [C, CN, PS, R, V]</p>	<ul style="list-style-type: none"> ➤ Identify a common attribute in a given set of objects. ➤ Sort a given set of objects, using a single attribute, e.g., colour, and explain the sorting rule.

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

Kindergarten

Strand: Shape and Space (Measurement)	General Outcome: Use direct and indirect measurement to solve problems.
Specific Outcomes	Achievement Indicators
<i>It is expected that students will:</i>	<i>The following set of indicators may be used to determine whether students have met the corresponding specific outcome.</i>
1. Use direct comparison to compare two objects based on a single attribute, such as length (height), mass (weight) and volume (capacity). [C, CN, PS, R, V]	<ul style="list-style-type: none"> ➤ Compare the length (height) of two given objects; and explain the comparison, using the words <i>shorter, longer (taller) or almost the same</i>. ➤ Compare the mass (weight) of two given objects; and explain the comparison, using the words <i>lighter, heavier or almost the same</i>. ➤ Compare the volume (capacity) of two given objects; and explain the comparison, using the words <i>less, more, bigger, smaller or almost the same</i>.

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

Kindergarten

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 may be used to determine whether students have met the corresponding specific outcome.</i>
2. Sort 3-D objects, using a single attribute. [C, CN, PS, R, V]	<ul style="list-style-type: none"> ➤ Identify a common attribute in a given set of 3-D objects. ➤ Sort a given set of familiar 3-D objects, using a single attribute such as size or shape, and explain the sorting rule. ➤ Determine the difference between two given pre-sorted sets by explaining a sorting rule used to sort them.
3. Build and describe 3-D objects. [CN, PS, V]	<ul style="list-style-type: none"> ➤ Create a representation of a given 3-D object, using materials such as modelling clay and building blocks, and compare the representation to the original 3-D object. ➤ Describe a given 3-D object, using words such as <i>big, little, round, like a box</i> and <i>like a can</i>.

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

Grade 1

Strand: Number	General Outcome: Develop number sense.
Specific Outcomes	Achievement Indicators
<i>It is expected that students will:</i>	<i>The following set of indicators may be used to determine whether students have met the corresponding specific outcome.</i>
1. Say the number sequence 0 to 100 by: <ul style="list-style-type: none"> • 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. [C, CN, ME, V]	<ul style="list-style-type: none"> ➤ Recite forward by 1s the number sequence between two given numbers (0 to 100). ➤ Recite backward by 1s the number sequence between two given numbers (20 to 0). ➤ Read a given numeral (0 to 100) when it is presented symbolically. ➤ Skip count forward by 2s to 20, starting at 0. ➤ Skip count forward by 5s to 100, starting at 0. ➤ Skip count forward by 10s to 100, starting at 0. ➤ Identify and read numbers in the environment. ➤ Identify and correct errors and omissions in a given number sequence.
2. Subitize (recognize at a glance) and name familiar arrangements of 1 to 10 objects or dots. [C, CN, ME, V]	<ul style="list-style-type: none"> ➤ Look briefly at a given familiar arrangement of objects or dots, and identify how many objects or dots there are without counting. ➤ Identify the number represented by a given arrangement of dots on a ten frame.
3. Demonstrate an understanding of counting by: <ul style="list-style-type: none"> • 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. [C, CN, ME, R, V]	<ul style="list-style-type: none"> ➤ Answer the question, “How many are in the set?”, using the last number counted in a given set. ➤ Identify and correct counting errors in a given counting sequence. ➤ Show that the count of the number of objects in a given set does not change regardless of the order in which the objects are counted. ➤ Count the number of objects in a given set, rearrange the objects, predict the new count and recount to verify the prediction. ➤ Determine the total number of objects in a given set, starting from a known quantity and counting on. ➤ Count quantity, using groups of 2, 5 or 10 and counting on. ➤ Record the number of objects in a given set (up to 100).

[C] Communication	[PS] Problem Solving
[CN] Connections	[R] Reasoning
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Grade 1

Strand: Number (continued)	General Outcome: Develop number sense.
4. Represent and describe numbers to 20, concretely, pictorially and symbolically. [C, CN, V]	<ul style="list-style-type: none"> ➤ Represent a given number up to 20, using a variety of manipulatives, including ten frames and base ten materials. ➤ Read given number words to 20. ➤ Partition any given quantity up to 20 into 2 parts, and identify the number of objects in each part. ➤ Model a given number, using two different objects; e.g., 10 desks represents the same number as 10 pencils. ➤ Place given numerals on a number line with benchmarks 0, 5, 10 and 20. ➤ Find examples of a given number in the environment.
5. Compare sets containing up to 20 elements, using: <ul style="list-style-type: none"> • referents • one-to-one correspondence to solve problems. [C, CN, ME, PS, R, V]	<ul style="list-style-type: none"> ➤ Build a set equal to a given set that contains up to 20 elements. ➤ Build a set that has more elements than, fewer elements than or as many elements as a given set. ➤ Build several sets of different objects that have the same given number of elements in the set. ➤ Compare two given sets, using one-to-one correspondence, and describe the sets, using comparative words such as <i>more</i>, <i>fewer</i> or <i>as many</i>. ➤ Compare a set to a given referent, using comparative language. ➤ Solve a given problem (pictures and words) that involves the comparison of two quantities.
6. Estimate quantities to 20 by using referents. [C, CN, ME, PS, R, V]	<ul style="list-style-type: none"> ➤ Estimate a given quantity by comparing it to a given referent (known quantity). ➤ Select an estimate for a given quantity from at least two possible choices, and explain the choice.
7. Demonstrate an understanding of conservation of number. [C, R, V]	<ul style="list-style-type: none"> ➤ Explain why for a given number of counters, no matter how they are grouped, the total number of counters does not change. ➤ Group a set of given counters in more than one way.

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Grade 1

Strand: Number (continued)	General Outcome: Develop number sense.
<p>8. Identify the number, up to 20, that is:</p> <ul style="list-style-type: none"> • one more • two more • one less • two less <p>than a given number. [C, CN, ME, R, V]</p>	<ul style="list-style-type: none"> ➤ Name the number that is one more, two more, one less or two less than a given number, up to 20. ➤ Represent a number on a ten frame that is one more, two more, one less or two less than a given number.
<p>9. Demonstrate an understanding of addition of numbers with answers to 20 and their corresponding subtraction facts, concretely, pictorially and symbolically, by:</p> <ul style="list-style-type: none"> • 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 representations, and recording the process symbolically. <p>[C, CN, ME, PS, R, V]</p>	<ul style="list-style-type: none"> ➤ Act out a given problem presented orally or through shared reading. ➤ Indicate if the scenario in a given problem represents additive or subtractive action. ➤ Represent the numbers and actions presented in a given problem by using manipulatives, and record them using sketches and/or number sentences. ➤ Create an addition problem based on personal experiences, and simulate the action with counters. ➤ Create a subtraction problem based on personal experiences, and simulate the action with counters. ➤ Create a word problem for a given number sentence (equation). ➤ Represent a given problem pictorially or symbolically to show the additive or subtractive action, and solve the problem.
<p>10. Describe and use mental mathematics strategies (memorization not intended), such as:</p> <ul style="list-style-type: none"> • counting on and counting back • making 10 • using doubles • thinking addition for subtraction <p>for basic addition facts and related subtraction facts to 18. [C, CN, ME, PS, R, V]</p>	<p>(It is not intended that students recall the basic facts but become familiar with strategies to mentally determine sums and differences.)</p> <ul style="list-style-type: none"> ➤ Use and describe a personal strategy for determining a given sum. ➤ Use and describe a personal strategy for determining a given difference. ➤ Refine personal strategies to increase their efficiency. ➤ Write the related subtraction fact for a given addition fact. ➤ Write the related addition fact for a given subtraction fact.

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

Grade 1

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 may be used to determine whether students have met the corresponding specific outcome.</i>
1. Demonstrate an understanding of repeating patterns (two to four elements) by: <ul style="list-style-type: none"> • describing • reproducing • extending • creating patterns using manipulatives, diagrams, sounds and actions. [C, PS, R, V] [ICT: P2–1.1]	<ul style="list-style-type: none"> ➤ Describe a given repeating pattern containing two to four elements in its core. ➤ Identify and describe errors in a given repeating pattern. ➤ Identify and describe the missing element(s) in a given repeating pattern. ➤ Create and describe a repeating pattern, using a variety of manipulatives, diagrams, sounds and actions. ➤ Reproduce and extend a given repeating pattern, using manipulatives, diagrams, sounds and actions. ➤ Identify and describe a repeating pattern in the environment, e.g., in the classroom, outdoors, using everyday language. ➤ Identify repeating events; e.g., days of the week, birthdays, seasons.
2. Translate repeating patterns from one representation to another. [C, CN, R, V]	<ul style="list-style-type: none"> ➤ Represent a given repeating pattern, using another mode; e.g., actions to sound, colour to shape, ABC ABC to bear eagle fish bear eagle fish. ➤ Describe a given repeating pattern, using a letter code; e.g., ABC ABC ...
3. Sort objects, using one attribute, and explain the sorting rule. [C, CN, R, V]	<ul style="list-style-type: none"> ➤ Identify a common attribute in a given set of objects. ➤ Choose a single attribute to sort a given set of objects, sort the set, and explain the sorting rule. ➤ Sort a given set of objects, using a given sorting rule. ➤ Determine the difference between two given pre-sorted sets of objects, and explain a possible sorting rule used to sort them.

[C] Communication	[PS] Problem Solving
[CN] Connections	[R] Reasoning
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	[V] Visualization

Grade 1

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 may be used to determine whether students have met the corresponding specific outcome.</i>
4. Describe equality as a balance and inequality as an imbalance, concretely and pictorially (0 to 20). [C, CN, R, V]	<ul style="list-style-type: none"> ➤ Construct two equal sets, using the same objects (same shape and mass), and demonstrate their equality of number, using a balance (limited to 20 elements). ➤ Construct two unequal sets, using the same objects (same shape and mass), and demonstrate their inequality of number, using a balance (limited to 20 elements). ➤ Determine if two given concrete sets are equal or unequal, and explain the process used.
5. Record equalities, using the equal symbol. [C, CN, PS, V]	<ul style="list-style-type: none"> ➤ Represent a given equality, using manipulatives or pictures. ➤ Represent a given pictorial or concrete equality in symbolic form. ➤ Provide examples of equalities where the given sum or difference is on either the left or right side of the equal symbol (=). ➤ Record different representations of the same quantity (0 to 20) as equalities.

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

Grade 1

Strand: Shape and Space (Measurement)	General Outcome: Use direct and indirect measurement to solve problems.
Specific Outcomes	Achievement Indicators
<i>It is expected that students will:</i>	<i>The following set of indicators may be used to determine whether students have met the corresponding specific outcome.</i>
<p>1. Demonstrate an understanding of measurement as a process of comparing by:</p> <ul style="list-style-type: none"> • identifying attributes that can be compared • ordering objects • making statements of comparison • filling, covering or matching. <p>[C, CN, PS, R, V]</p>	<ul style="list-style-type: none"> ➤ Identify common attributes, such as length (height), mass (weight), volume (capacity) and area, that could be used to compare two given objects. ➤ Order a set of objects by length (height), mass (weight), volume (capacity) or area, and explain their ordering. ➤ Compare two given objects, and identify the attributes used to compare. ➤ Determine which of two or more given objects is longest/shortest by matching, and explain the reasoning. ➤ Determine which of two or more given objects is heaviest/lightest by comparing, and explain the reasoning. ➤ Determine which of two or more given objects holds the most/least by filling, and explain the reasoning. ➤ Determine which of two or more given objects has the greatest/least area by covering, and explain the reasoning.

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

Grade 1

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 may be used to determine whether students have met the corresponding specific outcome.</i>
2. Sort 3-D objects and 2-D shapes, using one attribute, and explain the sorting rule. [C, CN, R, V]	<ul style="list-style-type: none"> ➤ Sort a given set of familiar 3-D objects or 2-D shapes, using a given sorting rule. ➤ Choose a single attribute to sort a given set of familiar 3-D objects, sort the set, and explain the sorting rule. ➤ Choose a single attribute to sort a given set of 2-D shapes, sort the set, and explain the sorting rule. ➤ Determine the difference between two given pre-sorted sets of familiar 3-D objects or 2-D shapes, and explain a possible sorting rule used to sort them.
3. Replicate composite 2-D shapes and 3-D objects. [CN, PS, V]	<ul style="list-style-type: none"> ➤ Select 2-D shapes from a given set to reproduce a given composite 2-D shape. ➤ Select 3-D objects from a given set to reproduce a given composite 3-D object. ➤ Predict and select the 2-D shapes used to produce a composite 2-D shape, and verify by deconstructing the composite shape. ➤ Predict and select the 3-D objects used to produce a composite 3-D object, and verify by deconstructing the composite object.
4. Compare 2-D shapes to parts of 3-D objects in the environment. [C, CN, V]	<ul style="list-style-type: none"> ➤ Identify 3-D objects in the environment that have parts similar to a given 2-D shape.

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

Grade 2

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 may be used to determine whether students have met the corresponding specific outcome.</i>
1. Say the number sequence 0 to 100 by: <ul style="list-style-type: none"> • 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. [C, CN, ME, R]	<ul style="list-style-type: none"> ➤ Extend a given skip counting sequence (by 2s, 5s or 10s) forward and backward. ➤ Skip count by 10s, given any number from 1 to 9 as a starting point. ➤ Identify and correct errors and omissions in a given skip counting sequence. ➤ Count a given sum of money with pennies, nickels or dimes (to 100¢). ➤ Count quantity, using groups of 2, 5 or 10 and counting on.
2. Demonstrate if a number (up to 100) is even or odd. [C, CN, PS, R]	<ul style="list-style-type: none"> ➤ Use concrete materials or pictorial representations to determine if a given number is even or odd. ➤ Identify even and odd numbers in a given sequence, such as in a hundred chart. ➤ Sort a given set of numbers into even and odd.
3. Describe order or relative position, using ordinal numbers (up to tenth). [C, CN, R]	<ul style="list-style-type: none"> ➤ Indicate a position of a specific object in a sequence by using ordinal numbers up to tenth. ➤ Compare the ordinal position of a specific object in two different given sequences.
4. Represent and describe numbers to 100, concretely, pictorially and symbolically. [C, CN, V]	<ul style="list-style-type: none"> ➤ Represent a given number, using concrete materials such as ten frames and base ten materials. ➤ Represent a given number, using coins (pennies, nickels, dimes and quarters). ➤ Represent a given number, using tallies. ➤ Represent a given number pictorially. ➤ Represent a given number, using expressions; e.g., $24 + 6$, $15 + 15$, $40 - 10$. ➤ Read a given number (0–100) in symbolic or word form. ➤ Record a given number (0–20) in words.

[C] Communication	[PS] Problem Solving
[CN] Connections	[R] Reasoning
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	[V] Visualization

Grade 2

Strand: Number (continued)	General Outcome: Develop number sense.
5. Compare and order numbers up to 100. [C, CN, ME, R, V]	<ul style="list-style-type: none"> ➤ Order a given set of numbers in ascending or descending order, and verify the result, using a hundred chart, number line, ten frames or by making references to place value. ➤ Identify and explain errors in a given ordered sequence. ➤ Identify missing numbers in a given hundred chart. ➤ Identify errors in a given hundred chart.
6. Estimate quantities to 100, using referents. [C, ME, PS, R]	<ul style="list-style-type: none"> ➤ Estimate a given quantity by comparing it to a referent (known quantity). ➤ Estimate the number of groups of ten in a given quantity, using 10 as a referent. ➤ Select between two possible estimates for a given quantity, and explain the choice.
7. Illustrate, concretely and pictorially, the meaning of place value for numerals to 100. [C, CN, R, V]	<ul style="list-style-type: none"> ➤ Explain and show with counters the meaning of each digit for a given 2-digit numeral with both digits the same; e.g., for the numeral 22, the first digit represents two tens (twenty counters) and the second digit represents two ones (two counters). ➤ Count the number of objects in a given set, using groups of 10s and 1s, and record the result as a 2-digit numeral under the headings 10s and 1s. ➤ Describe a given 2-digit numeral in at least two ways; e.g., 24 as two 10s and four 1s, twenty and four, two groups of ten and four left over, and twenty-four ones. ➤ Illustrate, using ten frames and diagrams, that a given numeral consists of a certain number of groups of ten and a certain number of ones. ➤ Illustrate, using base 10 materials, that a given numeral consists of a certain number of tens and a certain number of ones. ➤ Explain why the value of a digit depends on its placement within a numeral.
8. Demonstrate and explain the effect of adding zero to, or subtracting zero from, any number. [C, R]	<ul style="list-style-type: none"> ➤ Add zero to a given number, and explain why the sum is the same as the given number. ➤ Subtract zero from a given number, and explain why the difference is the same as the given number.

[C] Communication	[PS] Problem Solving
[CN] Connections	[R] Reasoning
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	[V] Visualization

Grade 2

Strand: Number (continued)	General Outcome: Develop number sense.
<p>9. Demonstrate an understanding of addition (limited to 1- and 2-digit numerals) with answers to 100 and the corresponding subtraction 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 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 in different ways does not affect the sum) • explaining that the order in which numbers are subtracted may affect the difference. <p>[C, CN, ME, PS, R, V]</p>	<ul style="list-style-type: none"> ➤ Model addition and subtraction, using concrete materials or visual representations, and record the process symbolically. ➤ Create an addition or a subtraction number sentence and a story problem for a given solution. ➤ Solve a given problem involving a missing addend, and describe the strategy used. ➤ Solve a given problem involving a missing minuend or subtrahend, and describe the strategy used. ➤ Refine personal strategies to increase their efficiency. ➤ Match a number sentence to a given missing addend problem. ➤ Match a number sentence to a given missing subtrahend or minuend problem. ➤ Explain or demonstrate why $5 + 6 = 6 + 5$. ➤ Add a given set of numbers, using the associative property of addition, and explain why the sum is the same; e.g., $2 + 5 + 3 + 8 = (2 + 3) + 5 + 8$ or $5 + 3 + (8 + 2)$. ➤ Solve a given problem, using horizontal and vertical formats.
<p>10. Apply mental mathematics strategies, such as:</p> <ul style="list-style-type: none"> • using doubles • making 10 • one more, one less • two more, two less • building on a known double • thinking addition for subtraction <p>for basic addition facts and related subtraction facts to 18.</p> <p>[C, CN, ME, PS, R, V]</p>	<ul style="list-style-type: none"> ➤ Explain or demonstrate the mental mathematics strategy that could be used to determine a basic fact, such as: <ul style="list-style-type: none"> • doubles; e.g., for $4 + 6$, think $5 + 5$ • doubles plus one; e.g., for $4 + 5$, think $4 + 4 + 1$ • doubles take away one; e.g., for $4 + 5$, think $5 + 5 - 1$ • doubles plus two; e.g., for $4 + 6$, think $4 + 4 + 2$ • doubles take away two; e.g., for $4 + 6$, think $6 + 6 - 2$ • making 10; e.g., for $7 + 5$, think $7 + 3 + 2$ • building on a known double; e.g., $6 + 6 = 12$, so $6 + 7 = 12 + 1 = 13$ • addition for subtraction; e.g., for $7 - 3$, think $3 + ? = 7$. ➤ Use and describe a personal strategy for determining a sum to 18 and the corresponding subtraction. ➤ Refine personal strategies to increase their efficiency.

[C] Communication	[PS] Problem Solving
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Grade 2

Strand: Patterns and Relations (Patterns)	General Outcome: Use patterns to describe the world and to solve problems.
Specific Outcomes	Achievement Indicators
<i>It is expected that students will:</i>	<i>The following set of indicators may be used to determine whether students have met the corresponding specific outcome.</i>
<p>1. Demonstrate an understanding of repeating patterns (three to five elements) by:</p> <ul style="list-style-type: none"> • describing • extending • comparing • creating <p>patterns using manipulatives, diagrams, sounds and actions. [C, CN, PS, R, V]</p>	<ul style="list-style-type: none"> ➤ Identify the core of a given repeating pattern. ➤ Describe and extend a given double attribute pattern. ➤ Explain the rule used to create a given repeating non-numerical pattern. ➤ Predict an element in a given repeating pattern, using a variety of strategies. ➤ Predict an element of a given repeating pattern, and extend the pattern to verify the prediction. ➤ Compare two given repeating patterns, and describe how they are alike/different. ➤ Create a repeating pattern where the core has three to five elements.
<p>2. Demonstrate an understanding of increasing patterns by:</p> <ul style="list-style-type: none"> • describing • reproducing • extending • creating <p>numerical (numbers to 100) and non-numerical patterns using manipulatives, diagrams, sounds and actions. [C, CN, PS, R, V]</p>	<ul style="list-style-type: none"> ➤ Identify and describe increasing patterns in a variety of given contexts; e.g., hundred chart, number line, addition tables, calendar, tiling pattern or drawings. ➤ Represent the relationship in a given increasing pattern, concretely and pictorially. ➤ Identify errors in a given increasing pattern. ➤ Explain the rule used to create a given increasing pattern. ➤ Create an increasing pattern, and explain the pattern rule. ➤ Represent a given increasing pattern, using another mode; e.g., colour to shape. ➤ Solve a given problem, using increasing patterns. ➤ Identify and describe increasing patterns in the environment; e.g., house/room numbers, book pages, calendar, pine cones, leap years. ➤ Determine missing elements in a given concrete, pictorial or symbolic increasing pattern, and explain the reasoning.
<p>3. Sort a set of objects, using two attributes, and explain the sorting rule. [C, CN, R, V]</p>	<ul style="list-style-type: none"> ➤ Determine the differences between two given pre-sorted sets, and explain the sorting rule. ➤ Identify and name two common attributes of items within a given sorted group. ➤ Choose two attributes to sort a given set of objects, sort the set, and explain the sorting rule.

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

Grade 2

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 may be used to determine whether students have met the corresponding specific outcome.</i>
4. Demonstrate and explain the meaning of equality and inequality, concretely and pictorially. [C, CN, R, V]	<ul style="list-style-type: none"> ➤ Determine whether two given quantities of the same object (same shape and mass) are equal by using a balance. ➤ Construct and draw two unequal sets, using the same object (same shape and mass), and explain the reasoning. ➤ Demonstrate how to change two given sets, equal in number, to create inequality. ➤ Choose from three or more given sets the one that does not have a quantity equal to the others, and explain why.
5. Record equalities and inequalities symbolically, using the equal symbol or the not equal symbol. [C, CN, R, V]	<ul style="list-style-type: none"> ➤ Determine whether two sides of a given number sentence are equal (=) or not equal (≠). Write the appropriate symbol and justify the answer. ➤ Model equalities, using a variety of concrete representations, and record the equalities symbolically. ➤ Model inequalities, using a variety of concrete representations, and record the inequalities symbolically.

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

Grade 2

Strand: Shape and Space (Measurement)	General Outcome: Use direct and indirect measurement to solve problems.
Specific Outcomes	Achievement Indicators
<i>It is expected that students will:</i>	<i>The following set of indicators may be used to determine whether students have met the corresponding specific outcome.</i>
1. Relate the number of days to a week and the number of months to a year in a problem-solving context. [C, CN, PS, R]	<ul style="list-style-type: none"> ➤ Read a date on a calendar. ➤ Name and order the days of the week. ➤ Identify the day of the week and the month of the year for an identified calendar date. ➤ Communicate that there are seven days in a week and twelve months in a year. ➤ Determine whether a given set of days is more or less than a week. ➤ Identify yesterday's/tomorrow's date. ➤ Identify the month that comes before and the month that comes after a given month. ➤ Name and order the months of the year. ➤ Solve a given problem involving time that is limited to the number of days in a week and the number of months in a 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). [C, CN, ME, R, V]	<ul style="list-style-type: none"> ➤ Explain why one of two given nonstandard units may be a better choice for measuring the length of an object. ➤ Explain why one of two given nonstandard units may be a better choice for measuring the mass (weight) of an object. ➤ Select a nonstandard unit for measuring the length or mass (weight) of an object, and explain why it was chosen. ➤ Estimate the number of nonstandard units needed for a given measurement task. ➤ Explain why the number of units of a measurement will vary depending upon the unit of measure used.
3. Compare and order objects by length, height, distance around and mass (weight), using nonstandard units, and make statements of comparison. [C, CN, ME, R, V]	<ul style="list-style-type: none"> ➤ Estimate, measure and record the length, height, distance around or mass (weight) of a given object, using nonstandard units. ➤ Compare and order the measure of two or more objects in ascending or descending order, and explain the method of ordering.

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

Grade 2

Strand: Shape and Space (Measurement) (continued)	General Outcome: Use direct and indirect measurement to solve problems.
4. Measure length to the nearest nonstandard unit by: <ul style="list-style-type: none"> • using multiple copies of a unit • using a single copy of a unit (iteration process). [C, ME, R, V]	<ul style="list-style-type: none"> ➤ Explain why overlapping or leaving gaps does not result in accurate measures. ➤ Count the number of nonstandard units required to measure the length of a given object, using a single copy or multiple copies of a unit. ➤ Estimate and measure a given object, using multiple copies of a nonstandard unit and using a single copy of the same unit many times, and explain the results. ➤ Estimate and measure, using nonstandard units, a given length that is not a straight line.
5. Demonstrate that changing the orientation of an object does not alter the measurements of its attributes. [C, R, V]	<ul style="list-style-type: none"> ➤ Measure a given object, change the orientation, re-measure, and explain the results.

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

Grade 2

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.
<p style="text-align: center;">Specific Outcomes</p> <p><i>It is expected that students will:</i></p>	<p style="text-align: center;">Achievement Indicators</p> <p><i>The following set of indicators may be used to determine whether students have met the corresponding specific outcome.</i></p>
<p>6. Sort 2-D shapes and 3-D objects, using two attributes, and explain the sorting rule. [C, CN, R, V]</p>	<ul style="list-style-type: none"> ➤ Determine the differences between two given pre-sorted sets, and explain the sorting rule. ➤ Identify and name two common attributes of items within a given sorted group. ➤ Sort a given set of 2-D shapes (regular and irregular), according to two attributes, and explain the sorting rule. ➤ Sort a given set of 3-D objects, according to two attributes, and explain the sorting rule.
<p>7. Describe, compare and construct 3-D objects, including:</p> <ul style="list-style-type: none"> • cubes • spheres • cones • cylinders • pyramids. <p>[C, CN, R, V]</p>	<ul style="list-style-type: none"> ➤ Sort a given set of 3-D objects, and explain the sorting rule. ➤ Identify common attributes of cubes, spheres, cones, cylinders and pyramids from given sets of the same 3-D objects. ➤ Identify and describe given 3-D objects with different dimensions. ➤ Identify and describe given 3-D objects with different orientations. ➤ Create and describe a representation of a given 3-D object, using materials such as modelling clay. ➤ Identify examples of cubes, spheres, cones, cylinders and pyramids found in the environment.

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

Grade 2

<p>Strand: Shape and Space (3-D Objects and 2-D Shapes) (continued)</p>	<p>General Outcome: Describe the characteristics of 3-D objects and 2-D shapes, and analyze the relationships among them.</p>
<p>8. Describe, compare and construct 2-D shapes, including:</p> <ul style="list-style-type: none"> • triangles • squares • rectangles • circles. <p>[C, CN, R, V]</p>	<ul style="list-style-type: none"> ➤ Sort a given set of 2-D shapes, and explain the sorting rule. ➤ Identify common attributes of triangles, squares, rectangles and circles from given sets of the same 2-D shapes. ➤ Identify given 2-D shapes with different dimensions. ➤ Identify given 2-D shapes with different orientations. ➤ Create a model to represent a given 2-D shape. ➤ Create a pictorial representation of a given 2-D shape.
<p>9. Identify 2-D shapes as parts of 3-D objects in the environment.</p> <p>[C, CN, R, V]</p>	<ul style="list-style-type: none"> ➤ Compare and match a given 2-D shape, such as a triangle, square, rectangle or circle, to the faces of 3-D objects in the environment. ➤ Name the 2-D faces of a given 3-D object.

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

Grade 2

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 may be used to determine whether students have met the corresponding specific outcome.</i>
1. Gather and record data about self and others to answer questions. [C, CN, PS, V] [ICT: C4–1.3, C7–1.1]	<ul style="list-style-type: none"> ➤ Formulate a question that can be answered by gathering information about self and others. ➤ Organize data as it is collected, using concrete objects, tallies, check marks, charts or lists. ➤ Answer questions, using collected data.
2. Construct and interpret concrete graphs and pictographs to solve problems. [C, CN, PS, R, V] [ICT: C7–1.3]	<ul style="list-style-type: none"> ➤ Determine the common attributes of concrete graphs by comparing a given set of concrete graphs. ➤ Determine the common attributes of pictographs by comparing a given set of pictographs. ➤ Answer questions pertaining to a given concrete graph or pictograph. ➤ Create a concrete graph to display a given set of data, and draw conclusions. ➤ Create a pictograph to represent a given set of data, using one-to-one correspondence. ➤ Solve a given problem by constructing and interpreting a concrete graph or pictograph.

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

Grade 3

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 may be used to determine whether students have met the corresponding specific outcome.</i>
<p>1. 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]</p>	<ul style="list-style-type: none"> ➤ Extend a given skip counting sequence by 5s, 10s or 100s, forward and backward, using a given starting point. ➤ Extend a given skip counting sequence by 3s, forward and backward, starting at a given multiple of 3. ➤ Extend a given skip counting sequence by 4s, forward and backward, starting at a given multiple of 4. ➤ Extend a given skip counting sequence by 25s, forward and backward, starting at a given multiple of 25. ➤ Identify and correct errors and omissions in a given skip counting sequence. ➤ Determine the value of a given set of coins (nickels, dimes, quarters, loonies) by using skip counting. ➤ Identify and explain the skip counting pattern for a given number sequence.
<p>2. Represent and describe numbers to 1000, concretely, pictorially and symbolically.</p> <p>[C, CN, V]</p>	<ul style="list-style-type: none"> ➤ Read a given three-digit numeral without using the word <i>and</i>; e.g., 321 is three hundred twenty-one, NOT three hundred AND twenty-one. ➤ Read a given number word (0 to 1000). ➤ Represent a given number as an expression; e.g., $300 - 44$ or $20 + 236$ for 256. ➤ Represent a given number, using manipulatives such as base ten materials. ➤ Represent a given number pictorially. ➤ Write number words for given multiples of ten to 90. ➤ Write number words for given multiples of a hundred to 900.

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

Grade 3

Strand: Number (continued)	General Outcome: Develop number sense.
3. Compare and order numbers to 1000. [C, CN, R, V]	<ul style="list-style-type: none"> ➤ 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. ➤ Create as many different 3-digit numerals as possible, given three different digits. Place the numbers in ascending or descending order. ➤ Identify and explain errors in a given ordered sequence. ➤ Identify missing numbers in parts of a given hundred chart. ➤ Identify errors in a given hundred chart.
4. Estimate quantities less than 1000, using referents. [ME, PS, R, V]	<ul style="list-style-type: none"> ➤ Estimate the number of groups of ten in a given quantity, using 10 as a referent (known quantity). ➤ Estimate the number of groups of a hundred in a given quantity, using 100 as a referent. ➤ Estimate a given quantity by comparing it to a referent. ➤ Select an estimate for a given quantity by choosing among three possible choices. ➤ Select and justify a referent for determining an estimate for a given quantity.
5. Illustrate, concretely and pictorially, the meaning of place value for numerals to 1000. [C, CN, R, V]	<ul style="list-style-type: none"> ➤ 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). ➤ 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. ➤ 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). ➤ Explain, using concrete materials, the meaning of zero as a place holder in a given number.

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

Grade 3

Strand: Number (continued)	General Outcome: Develop number sense.
<p>6. 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]</p>	<ul style="list-style-type: none"> ➤ Add two given 2-digit numerals, using a mental mathematics strategy, and explain or illustrate the strategy. ➤ Explain how to use the “adding from left to right” strategy; e.g., to determine the sum of $23 + 46$, think $20 + 40$ and $3 + 6$. ➤ 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 $50 + 28 - 3$. ➤ 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. ➤ Apply a mental mathematics strategy for adding two given 2-digit numerals.
<p>7. 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 • thinking of addition • using doubles. <p>[C, CN, ME, PS, R, V]</p>	<ul style="list-style-type: none"> ➤ Subtract two given 2-digit numerals, using a mental mathematics strategy, and explain or model the strategy used. ➤ 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 $48 - 20 + 1$. ➤ Explain how to use the “adding on” strategy; e.g., to determine the difference of $62 - 45$, think $45 + 5$, then $50 + 12$ and then $5 + 12$. ➤ Explain how to use the “using doubles” strategy; e.g., to determine the difference of $24 - 12$, think $12 + 12 = 24$. ➤ Apply a mental mathematics strategy for subtracting two given 2-digit numerals.
<p>8. Apply estimation strategies to predict sums and differences of two 2-digit numerals in a problem-solving context.</p> <p>[C, ME, PS, R]</p>	<ul style="list-style-type: none"> ➤ 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). ➤ 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).

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

Grade 3

Strand: Number (continued)	General Outcome: Develop number sense.
<p>9. 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]</p>	<ul style="list-style-type: none"> ➤ Model the addition of two or more given numbers, using concrete or visual representations, and record the process symbolically. ➤ Model the subtraction of two given numbers, using concrete or visual representations, and record the process symbolically. ➤ Create an addition or subtraction story problem for a given solution. ➤ Determine the sum of two given numbers, using a personal strategy; e.g., for $326 + 48$, record $300 + 60 + 14$. ➤ Determine the difference of two given numbers, using a personal strategy; e.g., for $127 - 38$, record $38 + 2 + 80 + 7$ or $127 - 20 - 10 - 8$. ➤ Refine personal strategies to increase their efficiency. ➤ Solve a given problem involving the sum or difference of two given numbers.
<p>10. Apply mental mathematics strategies and number properties, such as:</p> <ul style="list-style-type: none"> • using doubles • making 10 • using the commutative property • using the property of zero • thinking addition for subtraction <p>for basic addition facts and related subtraction facts to 18.</p> <p>[C, CN, ME, PS, R, V]</p>	<ul style="list-style-type: none"> ➤ Describe a mental mathematics strategy that could be used to determine a given basic fact, such as: <ul style="list-style-type: none"> • doubles; e.g., for $6 + 8$, think $7 + 7$ • doubles plus one; e.g., for $6 + 7$, think $6 + 6 + 1$ • doubles take away one; e.g., for $6 + 7$, think $7 + 7 - 1$ • doubles plus two; e.g., for $6 + 8$, think $6 + 6 + 2$ • doubles take away two; e.g., for $6 + 8$, think $8 + 8 - 2$ • making 10; e.g., for $6 + 8$, think $6 + 4 + 4$ or $8 + 2 + 4$ • commutative property; e.g., for $3 + 9$, think $9 + 3$ • addition for subtraction; e.g., for $13 - 7$, think $7 + ? = 13$. ➤ Provide a rule for determining answers when adding and subtracting zero. ➤ Apply a mental mathematics strategy to provide a solution to a given basic addition or subtraction fact to 18.

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

Grade 3

Strand: Number (continued)	General Outcome: Develop number sense.
<p>11. 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]</p>	<p>(It is not expected that students recall the basic facts but become familiar with strategies to mentally determine products.)</p> <ul style="list-style-type: none"> ➤ Identify events from experience that can be described as multiplication. ➤ Represent a given story problem, using manipulatives or diagrams, and record the problem in a number sentence. ➤ Represent a given multiplication expression as repeated addition. ➤ Represent a given repeated addition as multiplication. ➤ Create and illustrate a story problem for a given number sentence; e.g., $2 \times 3 = 6$. ➤ Represent, concretely or pictorially, equal groups for a given number sentence. ➤ Represent a given multiplication expression, using an array. ➤ Create an array to model the commutative property of multiplication. ➤ Relate multiplication to division by using arrays and writing related number sentences. ➤ Solve a given multiplication problem.
<p>12. 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]</p>	<ul style="list-style-type: none"> ➤ Identify events from experience that can be described as equal sharing. ➤ Identify events from experience that can be described as equal grouping. ➤ Illustrate, with counters or a diagram, a given story problem, presented orally, that involves equal sharing; and solve the problem. ➤ Illustrate, with counters or a diagram, a given story problem, presented orally, that involves equal grouping; and solve the problem. ➤ Listen to a story problem; represent the numbers, using manipulatives or a sketch; and record the problem with a number sentence. ➤ Create and illustrate, with counters, a story problem for a given number sentence; e.g., $6 \div 3 = 2$. ➤ Represent a given division expression as repeated subtraction. ➤ Represent a given repeated subtraction as a division expression. ➤ Relate division to multiplication by using arrays and writing related number sentences. ➤ Solve a given problem involving division.

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

Grade 3

Strand: Number (continued)	General Outcome: Develop number sense.
<p>13. 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]</p>	<ul style="list-style-type: none"> ➤ Identify common characteristics of a given set of fractions. ➤ Describe everyday situations where fractions are used. ➤ 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. ➤ Sort a given set of shaded regions into those that represent equal parts and those that do not, and explain the sorting. ➤ Represent a given fraction concretely or pictorially. ➤ Name and record the fraction represented by the shaded and non-shaded parts of a given region. ➤ Compare given fractions with the same denominator, using models. ➤ Identify the numerator and denominator for a given fraction. ➤ Model and explain the meaning of numerator and denominator.

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

Grade 3

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 may be used to determine whether students have met the corresponding specific outcome.</i>
<p>1. Demonstrate an understanding of increasing patterns by:</p> <ul style="list-style-type: none"> • describing • extending • comparing • creating <p>numerical (numbers to 1000) and non-numerical patterns using manipulatives, diagrams, sounds and actions. [C, CN, PS, R, V]</p>	<ul style="list-style-type: none"> ➤ 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. ➤ Identify the pattern rule of a given increasing pattern, and extend the pattern for the next three terms. ➤ Identify and explain errors in a given increasing pattern. ➤ Locate and describe various increasing patterns found on a hundred chart, such as horizontal, vertical and diagonal patterns. ➤ Compare numeric patterns of counting by 2s, 5s, 10s, 25s and 100s. ➤ Create a concrete, pictorial or symbolic representation of an increasing pattern for a given pattern rule. ➤ Create a concrete, pictorial or symbolic increasing pattern; and describe the relationship, using a pattern rule. ➤ Solve a given problem, using increasing patterns. ➤ Identify and describe increasing patterns in the environment. ➤ Identify and apply a pattern rule to determine missing elements for a given pattern. ➤ Describe the strategy used to determine missing elements in a given increasing pattern.

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

Grade 3

Strand: Patterns and Relations (Patterns) (continued)	General Outcome: Use patterns to describe the world and to solve problems.
<p>2. Demonstrate an understanding of decreasing patterns by:</p> <ul style="list-style-type: none"> • describing • extending • comparing • creating <p>numerical (numbers to 1000) and non-numerical patterns using manipulatives, diagrams, sounds and actions. [C, CN, PS, R, V]</p>	<ul style="list-style-type: none"> ➤ Describe a given decreasing pattern by stating a pattern rule that includes the starting point and a description of how the pattern continues. ➤ Identify the pattern rule of a given decreasing pattern, and extend the pattern for the next three terms. ➤ Identify and explain errors in a given decreasing pattern. ➤ Identify and describe various decreasing patterns found on a hundred chart, such as horizontal, vertical and diagonal patterns. ➤ Compare decreasing numeric patterns of counting backward by 2s, 5s, 10s, 25s and 100s. ➤ Create a concrete, pictorial or symbolic decreasing pattern for a given pattern rule. ➤ Create a concrete, pictorial or symbolic decreasing pattern; and describe the relationship, using a pattern rule. ➤ Solve a given problem, using decreasing patterns. ➤ Identify and describe decreasing patterns in the environment. ➤ Identify and apply a pattern rule to determine missing elements for a given pattern. ➤ Describe the strategy used to determine missing elements in a given decreasing pattern.
<p>3. Sort objects or numbers, using one or more than one attribute. [C, CN, R, V]</p>	<ul style="list-style-type: none"> ➤ Classify a given set of numbers according to the number of digits. ➤ Classify a given set of numbers as odd or even. ➤ Classify a given set of numbers as fractions or whole numbers. ➤ Determine the difference between two given pre-sorted sets of objects that have been sorted based on two attributes, and explain a possible sorting rule used to sort them. ➤ Record the sorting of a set of objects, using tools such as Venn diagrams. ➤ Sort a given set of objects or numbers in more than one way, and explain how the sorting rules are different.

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

Grade 3

Strand: Patterns and Relations (Variables and Equations)	General Outcome: Represent algebraic expressions in multiple ways.
<p style="text-align: center;">Specific Outcomes</p> <p><i>It is expected that students will:</i></p>	<p style="text-align: center;">Achievement Indicators</p> <p><i>The following set of indicators may be used to determine whether students have met the corresponding specific outcome.</i></p>
<p>4. Solve one-step addition and subtraction equations involving a symbol to represent an unknown number. [C, CN, PS, R, V]</p>	<ul style="list-style-type: none"> ➤ Explain the purpose of the symbol in a given addition or subtraction equation with one unknown; e.g., in the equation $3 + \blacktriangle = 10$, the triangle represents the number that would make the equation true. ➤ Create an addition or subtraction equation with one unknown to represent a given combining or separating action. ➤ Provide an alternative symbol for the unknown in a given addition or subtraction equation. ➤ Solve, using manipulatives, a given addition or subtraction equation with one unknown that represents combining or separating actions. ➤ Solve a given addition or subtraction equation with one unknown, using a variety of strategies, including guess and test. ➤ Solve a given addition or subtraction equation when the unknown is on the left or the right side of the equation. ➤ Explain why the unknown in a given addition or subtraction equation has only one value.

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

Grade 3

Strand: Shape and Space (Measurement)	General Outcome: Use direct and indirect measurement to solve problems.
Specific Outcomes <i>It is expected that students will:</i>	Achievement Indicators <i>The following set of indicators may be used to determine whether students have met the corresponding specific outcome.</i>
1. Relate the passage of time to common activities, using nonstandard and standard units (minutes, hours, days, weeks, months, years). [CN, ME, R]	<ul style="list-style-type: none"> ➤ 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. ➤ Identify activities that can or cannot be accomplished in minutes, hours, days, weeks, months and years. ➤ Provide personal referents for minutes and hours.
2. 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]	<ul style="list-style-type: none"> ➤ Determine the number of days in any given month, using a calendar. ➤ Solve a given problem involving the number of seconds in a minute, minutes in an hour or days in a given month. ➤ Create a calendar that includes days of the week, dates and personal events.
3. 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]	<ul style="list-style-type: none"> ➤ Provide a personal referent for one centimetre, and explain the choice. ➤ Provide a personal referent for one metre, and explain the choice. ➤ Match a given standard unit to a given referent. ➤ Show that 100 cm is equivalent to 1 m by using concrete materials. ➤ Estimate the length of an object, using personal referents. ➤ Determine and record the length and width of a given 2-D shape. ➤ Determine and record the length, width or height of a given 3-D object. ➤ Draw a line segment of a given length, using a ruler. ➤ Sketch a line segment of a given length without using a ruler.

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

Grade 3

<p>Strand: Shape and Space (Measurement) (continued)</p>	<p>General Outcome: Use direct and indirect measurement to solve problems.</p>
<p>4. 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]</p>	<ul style="list-style-type: none"> ➤ Provide a personal referent for one gram, and explain the choice. ➤ Provide a personal referent for one kilogram, and explain the choice. ➤ Match a given standard unit to a given referent. ➤ Explain the relationship between 1000 g and 1 kg, using a model. ➤ Estimate the mass of a given object, using personal referents. ➤ Determine and record the mass of a given 3-D object. ➤ Measure, using a scale, and record, using the units g and kg, the mass of given everyday objects. ➤ Provide examples of 3-D objects that have a mass of approximately 1 g, 100 g and 1 kg. ➤ Determine the mass of two given similar objects with different masses, and explain the results. ➤ Determine the mass of an object, change its shape, re-measure its mass, and explain the results.
<p>5. 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]</p>	<ul style="list-style-type: none"> ➤ Measure and record the perimeter of a given regular shape, and explain the strategy used. ➤ Measure and record the perimeter of a given irregular shape, and explain the strategy used. ➤ Construct a shape for a given perimeter (cm, m). ➤ Construct or draw more than one shape for a given perimeter. ➤ Estimate the perimeter of a given shape (cm, m), using personal referents.

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

Grade 3

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.
<p style="text-align: center;">Specific Outcomes</p> <p><i>It is expected that students will:</i></p>	<p style="text-align: center;">Achievement Indicators</p> <p><i>The following set of indicators may be used to determine whether students have met the corresponding specific outcome.</i></p>
<p>6. Describe 3-D objects according to the shape of the faces and the number of edges and vertices. [C, CN, PS, R, V]</p>	<ul style="list-style-type: none"> ➤ Identify the faces, edges and vertices of given 3-D objects, including cubes, spheres, cones, cylinders, pyramids and prisms. ➤ Identify the shape of the faces of a given 3-D object. ➤ Determine the number of faces, edges and vertices of a given 3-D object. ➤ Construct a skeleton of a given 3-D object, and describe how the skeleton relates to the 3-D object. ➤ Sort a given set of 3-D objects according to the number of faces, edges or vertices.
<p>7. Sort regular and irregular polygons, including:</p> <ul style="list-style-type: none"> • triangles • quadrilaterals • pentagons • hexagons • octagons <p>according to the number of sides. [C, CN, R, V]</p>	<ul style="list-style-type: none"> ➤ Classify a given set of regular and irregular polygons according to the number of sides. ➤ Identify given regular and irregular polygons that have different dimensions. ➤ Identify given regular and irregular polygons that have different orientations.

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

Grade 3

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 may be used to determine whether students have met the corresponding specific outcome.</i>
1. 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] [ICT: C4–1.3]	<ul style="list-style-type: none"> ➤ Record the number of objects in a given set, using tally marks. ➤ Determine the common attributes of line plots by comparing line plots in a given set. ➤ Organize a given set of data, using tally marks, line plots, charts or lists. ➤ Collect and organize data, using tally marks, line plots, charts and lists. ➤ Answer questions arising from a given line plot, chart or list. ➤ Answer questions using collected data.
2. Construct, label and interpret bar graphs to solve problems. [C, PS, R, V] [ICT: C4–1.3, C7–1.3, C7–1.4]	<ul style="list-style-type: none"> ➤ Determine the common attributes, titles and axes of bar graphs by comparing bar graphs in a given set. ➤ Create a bar graph, labelling the title and axes, to represent a given set of data. ➤ Draw conclusions from a given bar graph to solve problems. ➤ Solve problems by constructing and interpreting a bar graph.