

GENERAL AND SPECIFIC OUTCOMES

General and Specific Outcomes by Strand

(pages 20–51)

This section presents the general and specific outcomes for each strand, Kindergarten through Grade 9.

General and Specific Outcomes with Achievement Indicators by Grade

(pages 52–150)

This section presents specific outcomes with corresponding achievement indicators and is organized by strand within each grade. The list of indicators contained in this document is not intended to be exhaustive but rather to provide teachers with examples of evidence of understanding that may be used in determining whether or not students understand a given outcome. Teachers may use any number of these indicators, or they may choose to use other indicators as evidence that the desired learning has been achieved. Achievement indicators should also help teachers form a clear picture of the intent and scope of each mathematics outcome.

General and Specific Outcomes by Strand

Number

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

Kindergarten	Grade 1	Grade 2	Grade 3	Grade 4
General Outcome Develop number sense.	General Outcome Develop number sense.	General Outcome Develop number sense.	General Outcome Develop number sense.	General Outcome Develop number sense.
Specific Outcomes	Specific Outcomes	Specific Outcomes	Specific Outcomes	Specific Outcomes
<p>K.N.1. Say the number sequence by 1s, starting anywhere from 1 to 30 and from 10 to 1. [C, CN, V]</p> <p>K.N.2. Subitize and name familiar arrangements of 1 to 6 dots (or objects). [C, CN, ME, V]</p> <p>K.N.3. Relate a numeral, 1 to 10, to its respective quantity. [CN, R, V]</p> <p>K.N.4. Represent and describe numbers 2 to 10 in two parts, concretely and pictorially. [C, CN, ME, R, V]</p> <p>K.N.5. Demonstrate an understanding of counting to 10 by</p> <ul style="list-style-type: none"> ■ indicating that the last number said identifies “how many” ■ showing that any set has only one count <p>[C, CN, ME, R, V]</p>	<p>1.N.1. Say the number sequence by</p> <ul style="list-style-type: none"> ■ 1s forward and backward between any two given numbers (0 to 100) ■ 2s to 30, forward starting at 0 ■ 5s and 10s to 100, forward starting at 0 <p>[C, CN, ME, V]</p> <p>1.N.2. Subitize and name familiar arrangements of 1 to 10 dots (or objects). [C, CN, ME, V]</p> <p>1.N.3. Demonstrate an understanding of counting by</p> <ul style="list-style-type: none"> ■ using the counting on strategy ■ using parts or equal groups to count sets <p>[C, CN, ME, R, V]</p>	<p>2.N.1. Say the number sequence from 0 to 100 by</p> <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 <p>[C, CN, ME, R]</p> <p>2.N.2. Demonstrate if a number (up to 100) is even or odd. [C, CN, PS, R]</p> <p>2.N.3. Describe order or relative position using ordinal numbers. [C, CN, R]</p> <p>2.N.4. Represent and describe numbers to 100, concretely, pictorially, and symbolically. [C, CN, V]</p>	<p>3.N.1. Say the number sequence forward and backward from 0 to 1000 by</p> <ul style="list-style-type: none"> ■ 10s, or 100s, using any starting point ■ 5s using starting points that are multiples of five ■ 25s using starting points that are multiples of 25 <p>[C, CN, ME]</p> <p>3.N.2. Represent and describe numbers to 1000, concretely, pictorially, and symbolically. [C, CN, V]</p> <p>3.N.3. Compare and order numbers to 1000. [CN, R, V]</p> <p>3.N.4. Estimate quantities less than 1000 using referents. [ME, PS, R, V]</p>	<p>4.N.1. Represent and describe whole numbers to 10 000, pictorially and symbolically. [C, CN, V]</p> <p>4.N.2. Compare and order numbers to 10 000. [C, CN]</p> <p>4.N.3. Demonstrate an understanding of addition of numbers with answers to 10 000 and their corresponding subtractions (limited to 3- and 4-digit numerals) by</p> <ul style="list-style-type: none"> ■ using personal strategies for adding and subtracting ■ estimating sums and differences ■ solving problems involving addition and subtraction <p>[C, CN, ME, PS, R]</p>

Number

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

Grade 5	Grade 6	Grade 7	Grade 8	Grade 9
General Outcome Develop number sense.	General Outcome Develop number sense.	General Outcome Develop number sense.	General Outcome Develop number sense.	General Outcome Develop number sense.
Specific Outcomes	Specific Outcomes	Specific Outcomes	Specific Outcomes	Specific Outcomes
<p>5.N.1. Represent and describe whole numbers to 1 000 000. [C, CN, T, V]</p> <p>5.N.2. Apply estimation strategies, including</p> <ul style="list-style-type: none"> ■ front-end rounding ■ compensation ■ compatible numbers in problem-solving contexts. [C, CN, ME, PS, R, V] <p>5.N.3. Determine multiplication facts (to 81) and related division facts. [C, CN, ME, R, V]</p>	<p>6.N.1. Demonstrate an understanding of place value for numbers</p> <ul style="list-style-type: none"> ■ greater than one million ■ less than one-thousandth [C, CN, R, T] <p>6.N.2. Solve problems involving large numbers, using technology. [ME, PS, T]</p> <p>6.N.3. Demonstrate an understanding of factors and multiples by</p> <ul style="list-style-type: none"> ■ determining multiples and factors of numbers less than 100 ■ identifying prime and composite numbers ■ solving problems involving factors or multiples [PS, R, V] <p>6.N.4. Relate improper fractions to mixed numbers. [CN, ME, R, V]</p>	<p>7.N.1. Determine and explain why a number is divisible by 2, 3, 4, 5, 6, 8, 9, or 10, and why a number cannot be divided by 0. [C, R]</p> <p>7.N.2. Demonstrate an understanding of the addition, subtraction, multiplication, and division of decimals to solve problems (for more than 1-digit divisors or 2-digit multipliers, the use of technology is expected). [ME, PS, T]</p> <p>7.N.3. Solve problems involving percents from 1% to 100%. [C, CN, PS, ME, R, T]</p> <p>7.N.4. Demonstrate an understanding of the relationship between repeating decimals and fractions, and terminating decimals and fractions. [C, CN, R, T]</p>	<p>8.N.1. Demonstrate an understanding of perfect squares and square roots, concretely, pictorially, and symbolically (limited to whole numbers). [C, CN, R, V]</p> <p>8.N.2. Determine the approximate square root of numbers that are not perfect squares (limited to whole numbers). [C, CN, ME, R, T]</p> <p>8.N.3. Demonstrate an understanding of percents greater than or equal to 0%. [CN, PS, R, V]</p> <p>8.N.4. Demonstrate an understanding of ratio and rate. [C, CN, V]</p> <p>8.N.5. Solve problems that involve rates, ratios, and proportional reasoning. [C, CN, PS, R]</p>	<p>9.N.1. Demonstrate an understanding of powers with integral bases (excluding base 0) and whole-number exponents by</p> <ul style="list-style-type: none"> ■ representing repeated multiplication using powers ■ using patterns to show that a power with an exponent of zero is equal to 1 ■ solving problems involving powers [C, CN, PS, R] <p>9.N.2. Demonstrate an understanding of operations on powers with integral bases (excluding base 0) and whole-number exponents. [C, CN, PS, R, T]</p> <p>9.N.3. Demonstrate an understanding of rational numbers by</p> <ul style="list-style-type: none"> ■ comparing and ordering rational numbers ■ solving problems that involve arithmetic operations on rational numbers [C, CN, PS, R, T, V]

Number (continued)

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

Kindergarten	Grade 1	Grade 2	Grade 3	Grade 4
General Outcome Develop number sense.	General Outcome Develop number sense.	General Outcome Develop number sense.	General Outcome Develop number sense.	General Outcome Develop number sense.
Specific Outcomes	Specific Outcomes	Specific Outcomes	Specific Outcomes	Specific Outcomes
<p>K.N.6. Compare quantities, 1 to 10,</p> <ul style="list-style-type: none"> ■ using one-to-one correspondence ■ by ordering numbers representing different quantities <p>[C, CN, V]</p>	<p>1.N.4. Represent and describe numbers to 20, concretely, pictorially, and symbolically. [C, CN, V]</p> <p>1.N.5. Compare and order sets containing up to 20 elements to solve problems by using</p> <ul style="list-style-type: none"> ■ referents ■ one-to-one correspondence <p>[C, CN, ME, PS, R, V]</p> <p>1.N.6. Estimate quantities to 20 by using referents. [C, ME, PS, R, V]</p> <p>1.N.7. Demonstrate, concretely and pictorially, how a number, up to 30, can be represented by a variety of equal groups with and without singles. [C, R, V]</p> <p>1.N.8. Identify the number, up to 20, that is one more, two more, one less, and two less than a given number. [C, CN, ME, R, V]</p>	<p>2.N.5. Compare and order numbers up to 100. [C, CN, R, V]</p> <p>2.N.6. Estimate quantities to 100 using referents. [C, ME, PS, R]</p> <p>2.N.7. Illustrate, concretely and pictorially, the meaning of place value for numbers to 100. [C, CN, R, V]</p> <p>2.N.8. Demonstrate and explain the effect of adding zero to or subtracting zero from any number. [C, R]</p>	<p>3.N.5. Illustrate, concretely and pictorially, the meaning of place value for numerals to 1000. [C, CN, R, V]</p> <p>3.N.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, ME, PS, R, V]</p> <p>3.N.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, ME, PS, R, V]</p>	<p>4.N.4. Explain the properties of 0 and 1 for multiplication, and the property of 1 for division. [C, CN, R]</p> <p>4.N.5. Describe and apply mental mathematics strategies, such as</p> <ul style="list-style-type: none"> ■ skip-counting from a known fact ■ using doubling or halving ■ using doubling and adding one more group ■ using patterns in the 9s facts ■ using repeated doubling to develop recall of basic multiplication facts to 9×9 and related division facts. <p>[C, CN, ME, PS, R]</p>

Number (continued)

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

Grade 5	Grade 6	Grade 7	Grade 8	Grade 9
General Outcome Develop number sense.	General Outcome Develop number sense.	General Outcome Develop number sense.	General Outcome Develop number sense.	General Outcome Develop number sense.
Specific Outcomes	Specific Outcomes	Specific Outcomes	Specific Outcomes	Specific Outcomes
<p>5.N.4. Apply mental mathematics strategies for multiplication, such as</p> <ul style="list-style-type: none"> ■ annexing then adding zeros ■ halving and doubling ■ using the distributive property <p>[C, ME, R]</p> <p>5.N.5. Demonstrate an understanding of multiplication (2-digit numerals by 2-digit numerals) to solve problems. [C, CN, PS, V]</p> <p>5.N.6. Demonstrate an understanding of division (3-digit numerals by 1-digit numerals) with and without concrete materials, and interpret remainders to solve problems. [C, CN, PS]</p>	<p>6.N.5. Demonstrate an understanding of ratio, concretely, pictorially, and symbolically. [C, CN, PS, R, V]</p> <p>6.N.6. Demonstrate an understanding of percent (limited to whole numbers), concretely, pictorially, and symbolically. [C, CN, PS, R, V]</p> <p>6.N.7. Demonstrate an understanding of integers, concretely, pictorially, and symbolically. [C, CN, R, V]</p>	<p>7.N.5. Demonstrate an understanding of adding and subtracting positive fractions and mixed numbers, with like and unlike denominators, concretely, pictorially, and symbolically (limited to positive sums and differences). [C, CN, ME, PS, R, V]</p> <p>7.N.6. Demonstrate an understanding of addition and subtraction of integers, concretely, pictorially, and symbolically. [C, CN, PS, R, V]</p> <p>7.N.7. Compare and order fractions, decimals (to thousandths), and integers by using</p> <ul style="list-style-type: none"> ■ benchmarks ■ place value ■ equivalent fractions and/or decimals <p>[CN, R, V]</p>	<p>8.N.6. Demonstrate an understanding of multiplying and dividing positive fractions and mixed numbers, concretely, pictorially, and symbolically. [C, CN, ME, PS]</p> <p>8.N.7. Demonstrate an understanding of multiplication and division of integers, concretely, pictorially, and symbolically. [C, CN, PS, R, V]</p> <p>8.N.8. Solve problems involving positive rational numbers. [C, CN, ME, PS, R, T, V]</p>	<p>9.N.4. Explain and apply the order of operations, including exponents, with and without technology. [PS, T]</p> <p>9.N.5. Determine the square root of positive rational numbers that are perfect squares. [C, CN, PS, R, T]</p> <p>9.N.6. Determine an approximate square root of positive rational numbers that are non-perfect squares. [C, CN, PS, R, T]</p>

Number (continued)

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

Kindergarten	Grade 1	Grade 2	Grade 3	Grade 4
General Outcome Develop number sense.	General Outcome Develop number sense.	General Outcome Develop number sense.	General Outcome Develop number sense.	General Outcome Develop number sense.
Specific Outcomes	Specific Outcomes	Specific Outcomes	Specific Outcomes	Specific Outcomes
	<p>1.N.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 and mathematical language to describe additive and subtractive actions from their experience ■ 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>	<p>2.N.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 ■ explaining that the order in which numbers are added does not affect the sum ■ explaining that the order in which numbers are subtracted may affect the difference <p>[C, CN, ME, PS, R, V]</p>	<p>3.N.8. Apply estimation strategies to predict sums and differences of two 2-digit numerals in a problem-solving context. [C, ME, PS, R]</p> <p>3.N.9. Demonstrate an understanding of addition and subtraction of numbers with answers to 1000 (limited to 1-, 2-, and 3-digit numerals) 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 contexts that involve addition and subtraction of numbers concretely, pictorially, and symbolically. <p>[C, CN, ME, PS, R]</p>	<p>4.N.6. Demonstrate an understanding of multiplication (2- or 3-digit numerals by 1-digit numerals) to solve problems by</p> <ul style="list-style-type: none"> ■ using personal strategies for multiplication with and without concrete materials ■ using arrays to represent multiplication ■ connecting concrete representations to symbolic representations ■ estimating products <p>[C, CN, ME, PS, R, V]</p> <p>4.N.7. Demonstrate an understanding of division (1-digit divisor and up to 2-digit dividend) to solve problems by</p> <ul style="list-style-type: none"> ■ using personal strategies for dividing with and without concrete materials ■ estimating quotients ■ relating division to multiplication <p>[C, CN, ME, PS, R, V]</p>

Number *(continued)*

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

Grade 5	Grade 6	Grade 7	Grade 8	Grade 9
General Outcome Develop number sense.	General Outcome Develop number sense.			
Specific Outcomes	Specific Outcomes			
<p>5.N.7. Demonstrate an understanding of fractions by using concrete and pictorial representations to</p> <ul style="list-style-type: none"> ■ create sets of equivalent fractions ■ compare fractions with like and unlike denominators <p>[C, CN, PS, R, V]</p> <p>5.N.8. Describe and represent decimals (tenths, hundredths, thousandths) concretely, pictorially, and symbolically. [C, CN, R, V]</p> <p>5.N.9. Relate decimals to fractions (tenths, hundredths, thousandths). [CN, R, V]</p> <p>5.N.10. Compare and order decimals (tenths, hundredths, thousandths) by using</p> <ul style="list-style-type: none"> ■ benchmarks ■ place value ■ equivalent decimals <p>[CN, R, V]</p>	<p>6.N.8. Demonstrate an understanding of multiplication and division of decimals involving</p> <ul style="list-style-type: none"> ■ 1-digit whole-number multipliers ■ 1-digit natural number divisors ■ multipliers and divisors that are multiples of 10 <p>[C, CN, ME, PS, R, V]</p> <p>6.N.9. Explain and apply the order of operations, excluding exponents (limited to whole numbers). [CN, ME, PS, T]</p>			

Number (continued)

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

Kindergarten	Grade 1	Grade 2	Grade 3	Grade 4
	General Outcome Develop number sense.	General Outcome Develop number sense.	General Outcome Develop number sense.	General Outcome Develop number sense.
	Specific Outcomes	Specific Outcomes	Specific Outcomes	Specific Outcomes
	<p>1.N.10. Describe and use mental mathematics strategies (memorization not intended), including</p> <ul style="list-style-type: none"> ■ counting on or counting back ■ using one more or one less ■ making 10 ■ starting from known doubles ■ using addition to subtract to determine the basic addition and related subtraction facts to 18. <p>[C, CN, ME, PS, R, V]</p>	<p>2.N.10. Apply mental mathematics strategies, including</p> <ul style="list-style-type: none"> ■ using doubles ■ making 10 ■ using one more, one less ■ using two more, two less ■ building on a known double ■ using addition for subtraction <p>to develop recall of basic addition facts to 18 and related subtraction facts.</p> <p>[C, CN, ME, R, V]</p>	<p>3.N.10. Determine addition facts and related subtraction facts (to 18).</p> <p>[C, CN, ME, R, V]</p> <p>3.N.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>4.N.8. Demonstrate an understanding of fractions less than or equal to one by using concrete and pictorial representations to</p> <ul style="list-style-type: none"> ■ name and record fractions for the parts of a whole or a set ■ compare and order fractions ■ model and explain that for different wholes, two identical fractions may not represent the same quantity ■ provide examples of where fractions are used <p>[C, CN, PS, R, V]</p> <p>4.N.9. Describe and represent decimals (tenths and hundredths) concretely, pictorially, and symbolically.</p> <p>[C, CN, R, V]</p>

Number *(continued)*

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

Grade 5	Grade 6	Grade 7	Grade 8	Grade 9
General Outcome Develop number sense.				
Specific Outcomes				
5.N.11. Demonstrate an understanding of addition and subtraction of decimals (limited to thousandths). [C, CN, PS, R, V]				

Number (continued)

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

Kindergarten	Grade 1	Grade 2	Grade 3	Grade 4
			General Outcome Develop number sense.	General Outcome Develop number sense.
			Specific Outcomes	Specific Outcomes
			<p>3.N.12. Demonstrate an understanding of division 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>(limited to division related to multiplication facts up to 5×5). [C, CN, PS, R]</p>	<p>4.N.10. Relate decimals to fractions (to hundredths). [CN, R, V]</p> <p>4.N.11. Demonstrate an understanding of addition and subtraction of decimals (limited to hundredths) by</p> <ul style="list-style-type: none"> ■ using compatible numbers ■ estimating sums and differences ■ using mental math strategies to solve problems. <p>[C, ME, PS, R, V]</p>

Number *(continued)*

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

Grade 5	Grade 6	Grade 7	Grade 8	Grade 9
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Number (continued)

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

Kindergarten	Grade 1	Grade 2	Grade 3	Grade 4
			General Outcome Develop number sense.	
			Specific Outcomes	
			3.N.13. Demonstrate an understanding of fractions by <ul style="list-style-type: none"> ■ explaining that a fraction represents a portion of a whole divided into equal parts ■ describing situations in which fractions are used ■ comparing fractions of the same whole with like denominators [C, CN, ME, R, V]	

Number *(continued)*

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

Grade 5	Grade 6	Grade 7	Grade 8	Grade 9
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Patterns and Relations (Patterns)

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

Kindergarten	Grade 1	Grade 2	Grade 3	Grade 4
<p>General Outcome Use patterns to describe the world and solve problems.</p> <p>Specific Outcomes</p> <p>K.PR.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]</p>	<p>General Outcome Use patterns to describe the world and solve problems.</p> <p>Specific Outcomes</p> <p>1.PR.1. Demonstrate an understanding of repeating patterns (two to four elements) by</p> <ul style="list-style-type: none"> ■ describing ■ reproducing ■ extending ■ creating <p>patterns using manipulatives, diagrams, sounds, and actions. [C, PS, R, V]</p> <p>1.PR.2. Translate repeating patterns from one representation to another. [C, R, V]</p>	<p>General Outcome Use patterns to describe the world and solve problems.</p> <p>Specific Outcomes</p> <p>2.PR.1. Predict an element in a repeating pattern using a variety of strategies. [C, CN, PS, R, V]</p> <p>2.PR.2. Demonstrate an understanding of increasing patterns by</p> <ul style="list-style-type: none"> ■ describing ■ reproducing ■ extending ■ creating <p>patterns using manipulatives, diagrams, sounds, and actions (numbers to 100). [C, CN, PS, R, V]</p>	<p>General Outcome Use patterns to describe the world and solve problems.</p> <p>Specific Outcomes</p> <p>3.PR.1. Demonstrate an understanding of increasing patterns by</p> <ul style="list-style-type: none"> ■ describing ■ extending ■ comparing ■ creating <p>patterns using manipulatives, diagrams, and numbers (to 1000). [C, CN, PS, R, V]</p> <p>3.PR.2. Demonstrate an understanding of decreasing patterns by</p> <ul style="list-style-type: none"> ■ describing ■ extending ■ comparing ■ creating <p>patterns using manipulatives, diagrams, and numbers (starting from 1000 or less). [C, CN, PS, R, V]</p>	<p>General Outcome Use patterns to describe the world and solve problems.</p> <p>Specific Outcomes</p> <p>4.PR.1. Identify and describe patterns found in tables and charts, including a multiplication chart. [C, CN, PS, V]</p> <p>4.PR.2. Reproduce a pattern shown in a table or chart using concrete materials. [C, CN, V]</p> <p>4.PR.3. Represent and describe patterns and relationships using charts and tables to solve problems. [C, CN, PS, R, V]</p> <p>4.PR.4. Identify and explain mathematical relationships using charts and diagrams to solve problems. [CN, PS, R, V]</p>

Patterns and Relations (Patterns)

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

Grade 5	Grade 6	Grade 7	Grade 8	Grade 9
General Outcome Use patterns to describe the world and solve problems.	General Outcome Use patterns to describe the world and solve problems.	General Outcome Use patterns to describe the world and solve problems.	General Outcome Use patterns to describe the world and solve problems.	General Outcome Use patterns to describe the world and solve problems.
Specific Outcomes	Specific Outcomes	Specific Outcomes	Specific Outcomes	Specific Outcomes
5.PR.1. Determine the pattern rule to make predictions about subsequent elements. [C, CN, PS, R, V]	6.PR.1. Demonstrate an understanding of the relationships within tables of values to solve problems. [C, CN, PS, R] 6.PR.2. Represent and describe patterns and relationships using graphs and tables. [C, CN, ME, PS, R, V]	7.PR.1. Demonstrate an understanding of oral and written patterns and their corresponding relations. [C, CN, R] 7.PR.2. Construct a table of values from a relation, graph the table of values, and analyze the graph to draw conclusions and solve problems. [C, CN, R, V]	8.PR.1. Graph and analyze two-variable linear relations. [C, ME, PS, R, T, V]	9.PR.1. Generalize a pattern arising from a problem-solving context using linear equations, and verify by substitution. [C, CN, PS, R, V] 9.PR.2. Graph linear relations, analyze the graph, and interpolate or extrapolate to solve problems. [C, CN, PS, R, T, V]

Patterns and Relations (Variables and Equations)

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

Kindergarten	Grade 1	Grade 2	Grade 3	Grade 4
	General Outcome Represent algebraic expressions in multiple ways.	General Outcome Represent algebraic expressions in multiple ways.	General Outcome Represent algebraic expressions in multiple ways.	General Outcome Represent algebraic expressions in multiple ways.
	Specific Outcomes	Specific Outcomes	Specific Outcomes	Specific Outcomes
	1.PR.3. Describe equality as a balance and inequality as an imbalance, concretely and pictorially (0 to 20). [C, CN, R, V] 1.PR.4. Record equalities using the equal symbol (0 to 20). [C, CN, PS, V]	2.PR.3. Demonstrate and explain the meaning of equality and inequality by using manipulatives and diagrams (0 to 100). [C, CN, R, V] 2.PR.4. Record equalities and inequalities symbolically using the equal symbol or the not-equal symbol. [C, CN, R, V]	3.PR.3. Solve one-step addition and subtraction equations involving symbols representing an unknown number. [C, CN, PS, R, V]	4.PR.5. Express a problem as an equation in which a symbol is used to represent an unknown number. [CN, PS, R] 4.PR.6. Solve one-step equations involving a symbol to represent an unknown number. [C, CN, PS, R, V]

Patterns and Relations (Variables and Equations)

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

Grade 5	Grade 6	Grade 7	Grade 8	Grade 9
General Outcome Represent algebraic expressions in multiple ways.	General Outcome Represent algebraic expressions in multiple ways.	General Outcome Represent algebraic expressions in multiple ways.	General Outcome Represent algebraic expressions in multiple ways.	General Outcome Represent algebraic expressions in multiple ways.
Specific Outcomes	Specific Outcomes	Specific Outcomes	Specific Outcomes	Specific Outcomes
5.PR.2. Solve problems involving single-variable (expressed as symbols or letters), one-step equations with whole-number coefficients, and whole-number solutions. [C, CN, PS, R]	6.PR.3. Represent generalizations arising from number relationships using equations with letter variables. [C, CN, PS, R, V] 6.PR.4. Demonstrate and explain the meaning of preservation of equality, concretely, pictorially, and symbolically. [C, CN, PS, R, V]	7.PR.3. Demonstrate an understanding of preservation of equality by <ul style="list-style-type: none"> ■ modelling preservation of equality, concretely, pictorially, and symbolically ■ applying preservation of equality to solve equations [C, CN, PS, R, V] 7.PR.4. Explain the difference between an expression and an equation. [C, CN] 7.PR.5. Evaluate an expression given the value of the variable(s). [CN, R] 7.PR.6. Model and solve problems that can be represented by one-step linear equations of the form $x + a = b$, concretely, pictorially, and symbolically, where a and b are integers. [CN, PS, R, V]	8.PR.2. Model and solve problems using linear equations of the form: <ul style="list-style-type: none"> ■ $ax = b$ ■ $\frac{x}{a} = b, a \neq 0$ ■ $ax + b = c$ ■ $\frac{x}{a} + b = c, a \neq 0$ ■ $a(x + b) = c$ concretely, pictorially, and symbolically, where $a, b,$ and c are integers. [C, CN, PS, V]	9.PR..3. Model and solve problems using linear equations of the form: <ul style="list-style-type: none"> ■ $ax = b$ ■ $\frac{x}{a} = b, a \neq 0$ ■ $ax + b = c$ ■ $\frac{x}{a} + b = c, a \neq 0$ ■ $ax = b + cx$ ■ $a(x + b) = c$ ■ $ax + b = cx + d$ ■ $a(bx + c) = d(ex + f)$ ■ $\frac{a}{x} = b, x \neq 0$ where $a, b, c, d, e,$ and f are rational numbers. [C, CN, PS, V] 9.PR.4. Explain and illustrate strategies to solve single variable linear inequalities with rational number coefficients within a problem-solving context. [C, CN, PS, R, V] 9.PR.5. Demonstrate an understanding of polynomials (limited to polynomials of degree less than or equal to 2). [C, CN, R, V]

Patterns and Relations (Variables and Equations) *(continued)*

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

Kindergarten	Grade 1	Grade 2	Grade 3	Grade 4
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Patterns and Relations (Variables and Equations) *(continued)*

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

Grade 5	Grade 6	Grade 7	Grade 8	Grade 9
		<p>General Outcome Represent algebraic expressions in multiple ways.</p>		<p>General Outcome Represent algebraic expressions in multiple ways.</p>
		<p>Specific Outcomes</p>		<p>Specific Outcomes</p>
		<p>7.PR.7. Model and solve problems that can be represented by linear equations of the form:</p> <ul style="list-style-type: none"> ■ $ax + b = c$ ■ $ax = b$ ■ $\frac{x}{a} = b, a \neq 0$ <p>concretely, pictorially, and symbolically, where $a, b,$ and c are whole numbers. [CN, PS, R, V]</p>		<p>9.PR.6. Model, record, and explain the operations of addition and subtraction of polynomial expressions, concretely, pictorially, and symbolically (limited to polynomials of degree less than or equal to 2). [C, CN, PS, R, V]</p> <p>9.PR.7. Model, record, and explain the operations of multiplication and division of polynomial expressions (limited to polynomials of degree less than or equal to 2) by monomials, concretely, pictorially, and symbolically. [C, CN, R, V]</p>

Shape and Space (Measurement)

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

Kindergarten	Grade 1	Grade 2	Grade 3	Grade 4
General Outcome Use direct or indirect measurement to solve problems.	General Outcome Use direct or indirect measurement to solve problems.	General Outcome Use direct or indirect measurement to solve problems.	General Outcome Use direct or indirect measurement to solve problems.	General Outcome Use direct or indirect measurement to solve problems.
Specific Outcomes	Specific Outcomes	Specific Outcomes	Specific Outcomes	Specific Outcomes
K.SS.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]	1.SS.1. Demonstrate an understanding of measurement as a process of comparing by <ul style="list-style-type: none"> ■ identifying attributes that can be compared ■ ordering objects ■ making statements of comparison ■ filling, covering, or matching [C, CN, PS, R, V]	2.SS.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] 2.SS.2. Relate the size of a unit of measure to the number of units (limited to non-standard units) used to measure length and mass (weight). [C, CN, ME, R, V] 2.SS.3. Compare and order objects by length, height, distance around, and mass (weight) using non-standard units, and make statements of comparison. [C, CN, ME, R, V] 2.SS.4. Measure length to the nearest non-standard 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]	3.SS.1. Relate the passage of time to common activities using non-standard and standard units (minutes, hours, days, weeks, months, years). [CN, ME, R] 3.SS.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] 3.SS.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]	4.SS.1. Read and record time using digital and analog clocks, including 24-hour clocks. [C, CN, V] 4.SS.2. Read and record calendar dates in a variety of formats. [C, V] 4.SS.3. Demonstrate an understanding of area of regular and irregular 2-D shapes by <ul style="list-style-type: none"> ■ recognizing that area is measured in square units ■ selecting and justifying referents for the units cm^2 or m^2 ■ estimating area by using referents for cm^2 or m^2 ■ determining and recording area (cm^2 or m^2) ■ constructing different rectangles for a given area (cm^2 or m^2) in order to demonstrate that many different rectangles may have the same area [C, CN, ME, PS, R, V]

Shape and Space (Measurement)

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

Grade 5	Grade 6	Grade 7	Grade 8	Grade 9
General Outcome Use direct or indirect measurement to solve problems.	General Outcome Use direct or indirect measurement to solve problems.	General Outcome Use direct or indirect measurement to solve problems.	General Outcome Use direct or indirect measurement to solve problems.	General Outcome Use direct or indirect measurement to solve problems.
Specific Outcomes	Specific Outcomes	Specific Outcomes	Specific Outcomes	Specific Outcomes
<p>5.SS.1. Design and construct different rectangles given either perimeter or area, or both (whole numbers), and draw conclusions. [C, CN, PS, R, V]</p> <p>5.SS.2. Demonstrate an understanding of measuring length (mm) by</p> <ul style="list-style-type: none"> ■ selecting and justifying referents for the unit mm ■ modelling and describing the relationship between mm and cm units, and between mm and m units <p>[C, CN, ME, PS, R, V]</p>	<p>6.SS.1. Demonstrate an understanding of angles by</p> <ul style="list-style-type: none"> ■ identifying examples of angles in the environment ■ classifying angles according to their measure ■ estimating the measure of angles using 45°, 90°, and 180° as reference angles ■ determining angle measures in degrees ■ drawing and labelling angles when the measure is specified <p>[C, CN, ME, V]</p> <p>6.SS.2. Demonstrate that the sum of interior angles is</p> <ul style="list-style-type: none"> ■ 180° in a triangle ■ 360° in a quadrilateral <p>[C, R]</p>	<p>7.SS.1. Demonstrate an understanding of circles by</p> <ul style="list-style-type: none"> ■ describing the relationships among radius, diameter, and circumference of circles ■ relating circumference to pi ■ determining the sum of the central angles ■ constructing circles with a given radius or diameter ■ solving problems involving the radii, diameters, and circumferences of circles <p>[C, CN, R, V]</p> <p>7.SS.2. Develop and apply a formula for determining the area of</p> <ul style="list-style-type: none"> ■ triangles ■ parallelograms ■ circles <p>[CN, PS, R, V]</p>	<p>8.SS.1. Develop and apply the Pythagorean theorem to solve problems. [CN, PS, R, T, V]</p> <p>8.SS.2. Draw and construct nets for 3-D objects. [C, CN, PS, V]</p> <p>8.SS.3. Determine the surface area of</p> <ul style="list-style-type: none"> ■ right rectangular prisms ■ right triangular prisms ■ right cylinders <p>to solve problems. [C, CN, PS, R, V]</p> <p>8.SS.4. Develop and apply formulas for determining the volume of right prisms and right cylinders. [C, CN, PS, R, V]</p>	<p>9.SS.1. Solve problems and justify the solution strategy using circle properties, including</p> <ul style="list-style-type: none"> ■ the perpendicular from the centre of a circle to a chord bisects the chord ■ the measure of the central angle is equal to twice the measure of the inscribed angle subtended by the same arc ■ the inscribed angles subtended by the same arc are congruent ■ a tangent to a circle is perpendicular to the radius at the point of tangency <p>[C, CN, PS, R, T, V]</p>

Shape and Space (Measurement) *(continued)*

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

Kindergarten	Grade 1	Grade 2	Grade 3	Grade 4
		General Outcome Use direct or indirect measurement to solve problems.	General Outcome Use direct or indirect measurement to solve problems.	
		Specific Outcomes	Specific Outcomes	
		2.SS.5. Demonstrate that changing the orientation of an object does not alter the measurements of its attributes. [C, R, V]	3.SS.4. Demonstrate an understanding of measuring mass (g, kg) by <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 [C, CN, ME, PS, R, V]	
			3.SS.5. Demonstrate an understanding of perimeter of regular and irregular shapes by <ul style="list-style-type: none"> ■ estimating perimeter using referents for centimetre or metre ■ 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 [C, ME, PS, R, V]	

Shape and Space (Measurement)

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

Grade 5	Grade 6	Grade 7	Grade 8	Grade 9
General Outcome Use direct or indirect measurement to solve problems.	General Outcome Use direct or indirect measurement to solve problems.			
Specific Outcomes	Specific Outcomes			
<p>5.SS.3. Demonstrate an understanding of volume by</p> <ul style="list-style-type: none"> ■ selecting and justifying referents for cm^3 or m^3 units ■ estimating volume by using referents for cm^3 or m^3 ■ measuring and recording volume (cm^3 or m^3) ■ constructing rectangular prisms for a given volume <p>[C, CN, ME, PS, R, V]</p> <p>5.SS.4. Demonstrate an understanding of capacity by</p> <ul style="list-style-type: none"> ■ describing the relationship between mL and L ■ selecting and justifying referents for mL or L units ■ estimating capacity by using referents for mL or L ■ measuring and recording capacity (mL or L) <p>[C, CN, ME, PS, R, V]</p>	<p>6.SS.3. Develop and apply a formula for determining the</p> <ul style="list-style-type: none"> ■ perimeter of polygons ■ area of rectangles ■ volume of right rectangular prisms <p>[C, CN, PS, R, V]</p>			

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

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

Kindergarten	Grade 1	Grade 2	Grade 3	Grade 4
General Outcome Describe the characteristics of 3-D objects and 2-D shapes, and analyze the relationships among them.	General Outcome Describe the characteristics of 3-D objects and 2-D shapes, and analyze the relationships among them.	General Outcome Describe the characteristics of 3-D objects and 2-D shapes, and analyze the relationships among them.	General Outcome Describe the characteristics of 3-D objects and 2-D shapes, and analyze the relationships among them.	General Outcome Describe the characteristics of 3-D objects and 2-D shapes, and analyze the relationships among them.
Specific Outcomes	Specific Outcomes	Specific Outcomes	Specific Outcomes	Specific Outcomes
<p>K.SS.2. Sort 3-D objects using a single attribute. [C, CN, PS, R, V]</p> <p>K.SS.3. Build and describe 3-D objects. [CN, PS, V]</p>	<p>1.SS.2. Sort 3-D objects and 2-D shapes using one attribute, and explain the sorting rule. [C, CN, R, V]</p> <p>1.SS.3. Replicate composite 2-D shapes and 3-D objects. [CN, PS, V]</p> <p>1.SS.4. Compare 2-D shapes to parts of 3-D objects in the environment. [C, CN, V]</p>	<p>2.SS.6. Sort 2-D shapes and 3-D objects using two attributes, and explain the sorting rule. [C, CN, R, V]</p> <p>2.SS.7. Describe, compare, and construct 3-D objects, including</p> <ul style="list-style-type: none"> ■ cubes ■ spheres ■ cones ■ cylinders ■ prisms ■ pyramids <p>[C, CN, R, V]</p> <p>2.SS.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> <p>2.SS.9. Identify 2-D shapes as parts of 3-D objects in the environment. [C, CN, R, V]</p>	<p>3.SS.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> <p>3.SS.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>	<p>4.SS.4. Solve problems involving 2-D shapes and 3-D objects. [CN, PS, V]</p> <p>4.SS.5. Describe and construct rectangular and triangular prisms. [C, CN, R, V]</p>

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

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

Grade 5	Grade 6	Grade 7	Grade 8	Grade 9
<p>General Outcome Describe the characteristics of 3-D objects and 2-D shapes, and analyze the relationships among them.</p>	<p>General Outcome Describe the characteristics of 3-D objects and 2-D shapes, and analyze the relationships among them.</p>	<p>General Outcome Describe the characteristics of 3-D objects and 2-D shapes, and analyze the relationships among them.</p>	<p>General Outcome Describe the characteristics of 3-D objects and 2-D shapes, and analyze the relationships among them.</p>	<p>General Outcome Describe the characteristics of 3-D objects and 2-D shapes, and analyze the relationships among them.</p>
Specific Outcomes	Specific Outcomes	Specific Outcomes	Specific Outcomes	Specific Outcomes
<p>5.SS.5. Describe and provide examples of edges and faces of 3-D objects, and sides of 2-D shapes, that are</p> <ul style="list-style-type: none"> ■ parallel ■ intersecting ■ perpendicular ■ vertical ■ horizontal <p>[C, CN, R, T, V]</p> <p>5.SS.6. Identify and sort quadrilaterals, including</p> <ul style="list-style-type: none"> ■ rectangles ■ squares ■ trapezoids ■ parallelograms ■ rhombuses <p>according to their attributes. [C, R, V]</p>	<p>6.SS.4. Construct and compare triangles, including</p> <ul style="list-style-type: none"> ■ scalene ■ isosceles ■ equilateral ■ right ■ obtuse ■ acute <p>in different orientations. [C, PS, R, V]</p> <p>6.SS.5. Describe and compare the sides and angles of regular and irregular polygons. [C, PS, R, V]</p>	<p>7.SS.3. Perform geometric constructions, including</p> <ul style="list-style-type: none"> ■ perpendicular line segments ■ parallel line segments ■ perpendicular bisectors ■ angle bisectors <p>[CN, R, V]</p>	<p>8.SS.5. Draw and interpret top, front, and side views of 3-D objects composed of right rectangular prisms. [C, CN, R, T, V]</p>	<p>9.SS.2. Determine the surface area of composite 3-D objects to solve problems. [C, CN, PS, R, V]</p> <p>9.SS.3. Demonstrate an understanding of similarity of polygons. [C, CN, PS, R, V]</p>

Shape and Space (Transformations)

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

Kindergarten	Grade 1	Grade 2	Grade 3	Grade 4
				<p>General Outcome Describe and analyze position and motion of objects and shapes.</p>
				<p>Specific Outcomes</p>
				<p>4.SS.6. Demonstrate an understanding of line symmetry by</p> <ul style="list-style-type: none"> ■ identifying symmetrical 2-D shapes ■ creating symmetrical 2-D shapes ■ drawing one or more lines of symmetry in a 2-D shape <p>[C, CN, V]</p>

Shape and Space (Transformations)

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

Grade 5	Grade 6	Grade 7	Grade 8	Grade 9
<p>General Outcome Describe and analyze position and motion of objects and shapes.</p> <p>Specific Outcomes</p> <p>5.SS.7. Perform a single transformation (translation, rotation, or reflection) of a 2-D shape, and draw and describe the image. [C, CN, T, V]</p> <p>5.SS.8. Identify a single transformation (translation, rotation, or reflection) of 2-D shapes. [C, T, V]</p>	<p>General Outcome Describe and analyze position and motion of objects and shapes.</p> <p>Specific Outcomes</p> <p>6.SS.6. Perform a combination of transformations (translations, rotations, or reflections) on a single 2-D shape, and draw and describe the image. [C, CN, PS, T, V]</p> <p>6.SS.7. Perform a combination of successive transformations of 2-D shapes to create a design, and identify and describe the transformations. [C, CN, T, V]</p> <p>6.SS.8. Identify and plot points in the first quadrant of a Cartesian plane using whole-number ordered pairs. [C, CN, V]</p> <p>6.SS.9. Perform and describe single transformations of a 2-D shape in the first quadrant of a Cartesian plane (limited to whole-number vertices). [C, CN, PS, T, V]</p>	<p>General Outcome Describe and analyze position and motion of objects and shapes.</p> <p>Specific Outcomes</p> <p>7.SS.4. Identify and plot points in the four quadrants of a Cartesian plane using ordered pairs. [C, CN, V]</p> <p>7.SS.5. Perform and describe transformations of a 2-D shape in all four quadrants of a Cartesian plane (limited to integral vertices). [C, CN, PS, T, V]</p>	<p>General Outcome Describe and analyze position and motion of objects and shapes.</p> <p>Specific Outcomes</p> <p>8.SS.6. Demonstrate an understanding of tessellation by</p> <ul style="list-style-type: none"> ■ explaining the properties of shapes that make tessellating possible ■ creating tessellations ■ identifying tessellations in the environment <p>[C, CN, PS, T, V]</p>	<p>General Outcome Describe and analyze position and motion of objects and shapes.</p> <p>Specific Outcomes</p> <p>9.SS.4. Draw and interpret scale diagrams of 2-D shapes. [CN, R, T, V]</p> <p>9.SS.5. Demonstrate an understanding of line and rotation symmetry. [C, CN, PS, V]</p>

Statistics and Probability (Data Analysis)

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

Kindergarten	Grade 1	Grade 2	Grade 3	Grade 4
		General Outcome Collect, display, and analyze data to solve problems.	General Outcome Collect, display, and analyze data to solve problems.	General Outcome Collect, display, and analyze data to solve problems.
		Specific Outcomes	Specific Outcomes	Specific Outcomes
		2.SP.1. Gather and record data about self and others to answer questions. [C, CN, PS, V] 2.SP.2. Construct and interpret concrete graphs and pictographs to solve problems. [C, CN, PS, R, V]	3.SP.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, V] 3.SP.2. Construct, label, and interpret bar graphs to solve problems. [PS, R, V]	4.SP.1. Demonstrate an understanding of many-to-one correspondence. [C, R, T, V] 4.SP.2. Construct and interpret pictographs and bar graphs involving many-to-one correspondence to draw conclusions. [C, PS, R, V]

Statistics and Probability (Data Analysis)

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

Grade 5	Grade 6	Grade 7	Grade 8	Grade 9
General Outcome Collect, display, and analyze data to solve problems.	General Outcome Collect, display, and analyze data to solve problems.	General Outcome Collect, display, and analyze data to solve problems.	General Outcome Collect, display, and analyze data to solve problems.	General Outcome Collect, display, and analyze data to solve problems.
Specific Outcomes	Specific Outcomes	Specific Outcomes	Specific Outcomes	Specific Outcomes
<p>5.SP.1. Differentiate between first-hand and second-hand data. [C, R, T, V]</p> <p>5.SP.2. Construct and interpret double bar graphs to draw conclusions. [C, PS, R, T, V]</p>	<p>6.SP.1. Create, label, and interpret line graphs to draw conclusions. [C, CN, PS, R, V]</p> <p>6.SP.2. Select, justify, and use appropriate methods of collecting data, including</p> <ul style="list-style-type: none"> ■ questionnaires ■ experiments ■ databases ■ electronic media <p>[C, PS, T]</p> <p>6.SP.3. Graph collected data and analyze the graph to solve problems. [C, CN, PS]</p>	<p>7.SP.1. Demonstrate an understanding of central tendency and range by</p> <ul style="list-style-type: none"> ■ determining the measures of central tendency (mean, median, mode) and range ■ determining the most appropriate measures of central tendency to report findings <p>[C, PS, R, T]</p> <p>7.SP.2. Determine the effect on the mean, median, and mode when an outlier is included in a data set. [C, CN, PS, R]</p> <p>7.SP.3. Construct, label, and interpret circle graphs to solve problems. [C, CN, PS, R, T, V]</p>	<p>8.SP.1. Critique ways in which data are presented. [C, R, T, V]</p>	<p>9.SP.1. Describe the effect of</p> <ul style="list-style-type: none"> ■ bias ■ use of language ■ ethics ■ cost ■ time and timing ■ privacy ■ cultural sensitivity <p>on the collection of data. [C, CN, R, T]</p> <p>9.SP.2. Select and defend the choice of using either a population or a sample of a population to answer a question. [C, CN, PS, R]</p>

Statistics and Probability (Data Analysis) *(continued)*

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

Kindergarten	Grade 1	Grade 2	Grade 3	Grade 4
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Statistics and Probability (Data Analysis) *(continued)*

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

Grade 5	Grade 6	Grade 7	Grade 8	Grade 9
				<p>General Outcome Collect, display, and analyze data to solve problems.</p> <hr/> <p>Specific Outcomes</p> <p>9.SP. 3. Develop and implement a project plan for the collection, display, and analysis of data by</p> <ul style="list-style-type: none"> ■ formulating a question for investigation ■ choosing a data collection method that includes social considerations ■ selecting a population or a sample ■ collecting the data ■ displaying the collected data in an appropriate manner ■ drawing conclusions to answer the question <p>[C, PS, R, T, V]</p>

Statistics and Probability (Chance and Uncertainty)

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

Grade 5	Grade 6	Grade 7	Grade 8	Grade 9
General Outcome Use experimental or theoretical probabilities to represent and solve problems involving uncertainty.	General Outcome Use experimental or theoretical probabilities to represent and solve problems involving uncertainty.	General Outcome Use experimental or theoretical probabilities to represent and solve problems involving uncertainty.	General Outcome Use experimental or theoretical probabilities to represent and solve problems involving uncertainty.	General Outcome Use experimental or theoretical probabilities to represent and solve problems involving uncertainty.
Specific Outcomes	Specific Outcomes	Specific Outcomes	Specific Outcomes	Specific Outcomes
<p>5.SP.3. Describe the likelihood of a single outcome occurring, using words such as</p> <ul style="list-style-type: none"> ■ impossible ■ possible ■ certain <p>[C, CN, PS, R]</p> <p>5.SP.4. Compare the likelihood of two possible outcomes occurring, using words such as</p> <ul style="list-style-type: none"> ■ less likely ■ equally likely ■ more likely <p>[C, CN, PS, R]</p>	<p>6.SP.4. Demonstrate an understanding of probability by</p> <ul style="list-style-type: none"> ■ identifying all possible outcomes of a probability experiment ■ differentiating between experimental and theoretical probability ■ determining the theoretical probability of outcomes in a probability experiment ■ determining the experimental probability of outcomes in a probability experiment ■ comparing experimental results with the theoretical probability for an experiment <p>[C, ME, PS, T]</p>	<p>7.SP.4. Express probabilities as ratios, fractions, and percents. [C, CN, R, T, V]</p> <p>7.SP.5. Identify the sample space (where the combined sample space has 36 or fewer elements) for a probability experiment involving two independent events. [C, ME, PS]</p> <p>7.SP.6. Conduct a probability experiment to compare the theoretical probability (determined using a tree diagram, table, or another graphic organizer) and experimental probability of two independent events. [C, PS, R, T]</p>	<p>8.SP.2. Solve problems involving the probability of independent events. [C, CN, PS, T]</p>	<p>9.SP.4. Demonstrate an understanding of the role of probability in society. [C, CN, R, T]</p>