Draft Mathematics Kindergarten to Grade 6 Curriculum

	Kindergarten			Grade 1			Grade 2		
Organizing Idea	Number: Quantity is measured with numbers that enable counting, labelling, comparing, and operating.								
Guiding Question	How can quantity contribute meaning to our daily lives?			How can we communicate quantity?			How can quantity contribute to our sense of number?		
Learning Outcome	Children acquire an understanding of quantity to 10.			Students interpret and explain quantity to 100.			Students analyze quantity to 1000.		
	Knowledge	Understanding	Skills & Procedures	Knowledge	Understanding	Skills & Procedures	Knowledge	Understanding	Skills & Procedures
	Quantity can be expressed using • objects • pictures • words • numerals	Quantity can be the number of objects in a set.	Recognize a number of familiar objects as a quantity. Express a quantity in different ways. Relate a numeral to a specific quantity.	The absence of quantity is represented by 0. Canadian money includes • nickels • dimes • quarters • loonies • toonies • five-dollar bills • ten-dollar bills • twenty-dollar bills • fifty-dollar bills • hundred-dollar bills	Quantity is expressed in words and numerals based on patterns. Quantity in the world is represented in multiple ways, including with money.	Express quantities using words, objects, or pictures. Represent quantities using numerals. Identify a quantity of 0 in familiar situations. Express the value of each coin and bill within 100 dollars using words and numerals.	The number of objects in a set can be represented by a natural number. The number line is a spatial interpretation of quantity.	There are infinitely many natural numbers. Each natural number is associated with exactly one point on the number line.	Express quantities using words. Represent quantities using natural numbers. Relate a natural number to its position on the number line.

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	Quantity can be determined by counting with natural numbers.	A quantity is always counted using the same sequence of words (counting principle: stable order). A quantity remains the same no matter the order in which the objects are counted (counting principle: order irrelevance). A quantity can be determined by counting each object in a set once and only once (counting principle: one-to-one correspondence). The last number used to count represents the quantity (counting principle: cardinality). Any quantity of like or unlike objects can be counted as a set (counting principle: abstraction).	Count within 10, forward and backward, starting at any number, according to the counting principles.	Counting can begin at any number. Counting more than one object at a time is called skip counting.	Each number counted includes all previous numbers (counting principle: hierarchical inclusion). A quantity can be determined by counting more than one object in a set at a time.	Count within 100, forward by 1, starting at any number, according to the counting principles. Count backward from 20 to 0 by 1. Skip count to 100, forward by 5 and 10, starting at 0. Skip count to 20, forward by 2, starting at 0.	A quantity can be skip counted in various ways according to context, including by denominations of coins and bills.	A quantity can be interpreted as a composition of groups.	Decompose quantities into groups of 100s, 10s, and ones. Count within 1000, forward and backward by 1, starting at any number. Skip count by 20, 25, or 50, starting at 0. Determine the value of a collection of coins or bills of the same denomination by skip counting.
	A small quantity can be recognized at a glance (subitized).	Quantity can be determined without counting.	Subitize quantities to 5.	Familiar arrangements of small quantities facilitate subitizing.	A quantity can be perceived as the composition of smaller quantities.	Recognize quantities to 10.	A benchmark is a known quantity to which another quantity can be compared.	A quantity can be estimated when an exact count is not needed.	Estimate quantities using benchmarks.
	Comparative language can include • more • less • same • enough • too many • too few	A quantity can be described relative to another quantity. A quantity can be described in relation to a purpose or need.	Describe quantities relative to each other using comparative language. Describe a quantity in relation to a purpose or need using comparative language. Solve problems in familiar situations by counting.	Words that describe a comparison between two quantities include • equal • not equal • greater than • less than The equal sign is =. The unequal sign is ≠.	Two quantities are equal when there is the same number of objects in both sets.	Compare quantities in two sets of objects. Describe a quantity relative to another quantity. Represent equal quantities symbolically. Represent unequal quantities symbolically.	The less than sign is <. The greater than sign is >.	Each natural number is one greater than the natural number to its left on the number line, visualized horizontally.	Compare and order natural numbers. Describe a natural number as greater than, less than, or equal to another natural number using words or symbols.

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	Kindergarten			Grade 1			Grade 2		
Organizing Idea	Number: Quantity is measured with numbers that enable counting, labelling, comparing, and operating.								
Guiding Question	In what ways can we compose quantity?			How can addition and subtraction provide perspectives of number?			How can we interpret addition and subtraction?		
Learning Outcome	Children interpret compositions of quantities within 10.			Students acquire an understanding of addition and subtraction within 20.			Students explain addition and subtraction within 100.		
	Knowledge	Understanding	Skills & Procedures	Knowledge	Understanding	Skills & Procedures	Knowledge	Understanding	Skills & Procedures
	Quantity can be arranged in various ways.	A quantity remains the same no matter how the objects are grouped or arranged (counting principle: conservation).	Identify a quantity in various groups or arrangements. Compose quantities within 10.	Addition and subtraction are opposite (inverse) mathematical operations. Addition is a process of combining quantities to find a sum. Subtraction is a process of finding the difference between quantities. The order in which two quantities are added does not affect the sum (commutative property). The order in which two quantities are subtracted affects the difference. Addition of 0 to any number, or subtraction of 0 from any number, results in the same number (zero property).	Quantities can be composed or decomposed through addition and subtraction.	Compose quantities within 20 in various ways.	The order in which more than two numbers are added does not affect the sum (associative property).	A sum can be composed in multiple ways.	Compose a sum in multiple ways, including with more than two addends.

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				Strategies are meaningful steps taken to solve problems. Addition and subtraction strategies include • counting on • counting back • decomposition • compensation The addition sign is +. The subtraction sign is -. The equal sign is =.	Addition and subtraction can show a change in quantity through joining, separating, or comparing.	Investigate addition and subtraction strategies. Add and subtract within 20. Express addition and subtraction symbolically. Solve problems using addition and subtraction in joining, separating, or comparing situations. Model transactions with money, limited to dollar values within 20 dollars.	Familiar addition and subtraction number facts facilitate addition and subtraction strategies.	Addition and subtraction can represent the sum or difference of countable quantities (e.g., marbles or blocks) or measurable lengths (e.g., string length or student height).	Recall and apply addition number facts, with addends to 10, and related subtraction number facts. Add and subtract numbers within 100. Solve problems using addition and subtraction of countable quantities or measurable lengths. Model transactions with money, limited to dollar values within 100 dollars or cent values within 100 cents.
				Addition and subtraction number facts represent part-part-whole relationships. In a part-part-whole relationship, the sum represents the whole and the difference represents a missing part. Fact families are groups of related addition and subtraction number facts.	Addition number facts have related subtraction number facts.	Identify patterns in addition and subtraction, including patterns in addition tables. Recognize families of related addition and subtraction number facts. Recall addition number facts, with addends to 10, and related subtraction number facts.			

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	Kindergarten			Grade 1			Grade 2		
Organizing Idea	Number: Quantity is measured with numbers that enable counting, labelling, comparing, and operating.								
Guiding Question				In what ways can we interpret the composition of number?			In what ways can composition characterize number?		
Learning Outcome				Students represent equal sharing and grouping of quantities within 20.			Students interpret even and odd quantities within 100.		
				Knowledge	Understanding	Skills & Procedures	Knowledge	Understanding	Skills & Procedures
				Sharing involves partitioning a quantity into a certain number of groups. Grouping involves partitioning a quantity into groups of a certain size.	Quantity can be partitioned by sharing or grouping.	Partition a set of objects by sharing and grouping. Demonstrate conservation of number when sharing or grouping.	An even quantity will have no remainder when partitioned into two equal groups or groups of two. An odd quantity will have a remainder of one when partitioned into two equal groups or groups of two.	All natural numbers are either even or odd.	Model even and odd quantities by sharing and grouping. Describe a quantity as even or odd. Partition a set of objects by sharing or grouping, with or without remainders.

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	Kindergarten			Grade 1			Grade 2		
Organizing Idea	Number: Quantity is measured with numbers that enable counting, labelling, comparing, and operating.								
Guiding Question				In what ways can parts and wholes be related?			In what ways can parts compose a whole?		
Learning Outcome				Students recognize one-half as a part-whole relationship.			Students interpret one whole using halves and quarters.		
				Knowledge	Understanding	Skills & Procedures	Knowledge	Understanding	Skills & Procedures
				One-half can be one of two equal groups.	In a quantity partitioned into two equal groups, each group represents one-half of the quantity.	Identify one-half in familiar situations. Partition an even set of objects into two equal groups.	One-half is one of two equal parts. One-quarter is one of four equal parts.	When a quantity is partitioned into equal groups, each group represents an equal part of the whole quantity.	Partition an even set of objects into two equal groups and four equal groups. Describe one of two equal groups as one-half and one of four equal groups as one-quarter. Describe a whole set of objects as a composition of halves and as a composition of quarters.

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	Kindergarten			Grade 1			Grade 2		
Organizing Idea	Geometry: Shapes are defined and related by geometric attributes.								
Guiding Question	How can shape bring meaning to the space around us?			In what ways can we characterize shape?			How can shape influence our perception of space?		
Learning Outcome	Children acquire an understanding of shape.			Students interpret shape in two and three dimensions.			Students analyze and explain geometric attributes of shape.		
	Knowledge	Understanding	Skills & Procedures	Knowledge	Understanding	Skills & Procedures	Knowledge	Understanding	Skills & Procedures
	A shape can be represented using objects, pictures, or words. Two-dimensional shapes include • squares • circles • rectangles • triangles Three-dimensional shapes include • cubes • prisms • cylinders • spheres First Nations, Métis, and Inuit name specific shapes in relation to the natural world.	Shape is structured two-dimensional or three-dimensional space.	Relate shapes in the natural world to various two-dimensional and three-dimensional shapes. Identify two- and three-dimensional shapes. Investigate three-dimensional shapes by rolling, stacking, or sliding. Describe a shape using words such as flat, curved, straight, or round. Sort shapes according to one attribute and describe the sorting rule.	Two-dimensional shapes include • squares • circles • rectangles • triangles Three-dimensional shapes include • cubes • prisms • cylinders • spheres • pyramids • cones A line of symmetry indicates the division between the matching halves of a symmetrical shape.	A shape can be modelled in various sizes and orientations. A shape can be composed of two or more shapes. A shape is symmetrical if it can be decomposed into matching halves.	Identify shapes in various sizes and orientations. Model two-dimensional shapes. Sort shapes according to one attribute and describe the sorting rule. Compose and decompose two- or three-dimensional shapes. Identify shapes within two- or three-dimensional composite shapes. Investigate symmetry of two-dimensional shapes by folding and matching.	Common geometric attributes include • sides • vertices • faces or surfaces Two-dimensional shapes may have sides that are line segments. Three-dimensional shapes may have faces that are two-dimensional shapes.	Shapes are defined according to geometric attributes. A shape can be visualized as a composition of other shapes.	Sort shapes according to two geometric attributes and describe the sorting rule. Relate the faces of three-dimensional shapes to two-dimensional shapes. Create a picture or design with shapes from verbal instructions, visualization, or memory.

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						A shape can change orientation or position through slides (translations), turns (rotations), or flips (reflections).	Geometric attributes do not change when a shape is translated, rotated, or reflected. First Nations, Métis, and Inuit translate, rotate, and reflect shapes in the creation of cultural art.	Investigate translation, rotation, and reflection of two- and three-dimensional shapes. Describe geometric attributes of two- and three-dimensional shapes in various orientations. Recognize translation, rotation, or reflection of shapes represented in First Nations, Métis, or Inuit art inspired by the natural world.

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	Kindergarten			Grade 1			Grade 2		
Organizing Idea	Measurement: Attributes such as length, area, volume, and angle are quantified by measurement.								
Guiding Question	In what ways can we distinguish size?			In what ways can length provide perspectives of size?			How can length contribute to our interpretation of space?		
Learning Outcome	Children acquire an understanding of size through direct comparison.			Students apply an understanding of size to the interpretation of length.			Students communicate length using units.		
	Knowledge	Understanding	Skills & Procedures	Knowledge	Understanding	Skills & Procedures	Knowledge	Understanding	Skills & Procedures
	Measurable attributes can include • length • area • capacity • mass	Size describes the amount of one measurable attribute of an object or a space.	Identify measurable attributes of familiar objects to which size may refer.	Length may refer to the size of any one-dimensional measurable attribute of an object, including: • height • width • depth • diameter A length does not need to be a straight line. The length of empty space between two points is called distance. Familiar contexts of distance include • distance between objects or people • distance between home and school • distance between towns or cities	Length is a measurable attribute that describes the amount of fixed space between the end points of an object. Length remains the same if an object is repositioned but may be named differently.	Recognize the height, width, or depth of an object as lengths in various orientations. Recognize the diameter of a circle as a length. Compare and order objects according to length. Describe distance in familiar contexts.	Tiling is the process of measuring a length with many copies of a unit without gaps or overlaps. Iterating is the process of measuring a length by repeating one copy of a unit without gaps or overlaps. Length can be measured more efficiently using a measuring tool that shows iterations of a unit. The unit can be chosen based on the length to be measured. Length can be measured with non-standard units or standard units (e.g., centimetres). Standard units enable a common language around measurement.	Length is quantified by measurement. Length is measured with equal-sized units that themselves have length. The size of the unit and the number of units in the length are inversely related.	Measure length with non-standard units by tiling, iterating, or using a self-created measuring tool. Compare and order measurements of different lengths measured with the same non-standard units, and explain the choice of unit. Compare measurements of the same length measured with different non-standard units. Measure length with standard units by tiling or iterating with a centimetre. Compare and order measurements of different lengths measured with centimetres.

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	Comparative language can include • longer • taller • shorter • heavier • lighter • bigger • smaller • big enough • too big • too small	Size may refer to only one measurable attribute at a time. The size of two objects can be compared directly. The size of an object can be described in relation to a purpose or need.	Compare the length, area, mass, or capacity of two objects directly. Order objects according to length, area, mass, or capacity. Describe the size of an object in relation to another object, using comparative language. Describe the size of an object in relation to a purpose or need, using comparative language.	Indirect comparison is useful when objects are fixed in place or difficult to move.	The size of two objects can be compared indirectly with a third object.	Compare the length, area, mass, or capacity of two objects directly, or indirectly using a third object. Order objects according to length, area, mass, or capacity. Describe the size of an object in relation to another object, using comparative language.	A referent is a personal or familiar representation of a known length. A common referent for a centimetre is the width of the tip of the little finger.	Length can be estimated when a measuring tool is not available.	Identify referents for a centimetre. Estimate length by visualizing the iteration of a referent for a centimetre. Investigate First Nations, Métis, or Inuit use of the land in estimations of length.

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	Kindergarten			Grade 1			Grade 2		
Organizing Idea	Patterns: Awareness of patterns supports problem solving in various situations.								
Guiding Question	How can we distinguish pattern?			What can pattern communicate?			How can pattern characterize change?		
Learning Outcome	Children acquire an understanding of repeating patterns.			Students examine pattern in cycles.			Students explain and generalize pattern.		
	Knowledge	Understanding	Skills & Procedures	Knowledge	Understanding	Skills & Procedures	Knowledge	Understanding	Skills & Procedures
	Patterns exist everywhere. The elements of a pattern can include • sounds • objects • pictures • symbols • actions Pattern is characterized by how the elements change or remain constant. Repeating patterns have one or more elements that repeat. A pattern core is a sequence of one or more elements that repeat as a unit.	Pattern is defined by the relationship between individual elements.	Recognize repeating patterns encountered in daily routines and play, including songs or dances. Recognize change or constancy between elements in a repeating pattern. Identify the pattern core, up to three elements, in a repeating pattern. Predict the next elements in a repeating pattern. Create a repeating pattern with a pattern core of up to three elements.	A cycle can express repetition of events or experiences. Cycles include • seasons • day/night • life cycles • calendars A pattern remains the same when elements are represented in different forms, including • sounds • objects • pictures • symbols • actions Patterns can be extended by reasoning about existing elements.	A pattern that appears to repeat may not repeat in the same way forever. A cycle is a repeating pattern that repeats in the same way forever.	Recognize cycles encountered in daily routines and nature. Investigate cycles found in nature that inform First Nations, Métis, or Inuit practices. Identify the pattern core, up to four elements, in a cycle. Identify a missing element in a repeating pattern or cycle. Describe change and constancy in repeating patterns and cycles. Create different representations of the same repeating pattern or cycle, limited to a pattern core of up to four elements. Extend a sequence of elements in various ways to create repeating	Change can be an increase or a decrease in the number and size of elements. A hundreds chart is an arrangement of natural numbers that illustrates multiple patterns.	A pattern can show increasing or decreasing change. A pattern is more evident when the elements are represented, organized, aligned, or oriented in familiar ways.	Describe non-repeating patterns encountered in surroundings, including in art, architecture, and nature. Examine the representation, organization, alignment, or orientation of patterns in First Nations, Métis, or Inuit design. Investigate patterns in a hundreds chart. Create and express growing patterns using sounds, objects, pictures, or actions. Explain the change and constancy in a given non-numerical growing pattern. Extend a non-numerical growing pattern.

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						patterns.			
							A pattern core becomes more complex as more attributes change between elements.	A pattern core can vary in complexity.	Create and express a repeating pattern with a pattern core of up to four elements that change by more than one attribute.

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	Kindergarten			Grade 1			Grade 2		
Organizing Idea	Time: Duration is described and quantified with time.								
Guiding Question	How can we make sense of time?			How can time characterize change?			How can duration support our interpretation of time?		
Learning Outcome	Children acquire an understanding of time as a sequence of events.			Students explain time in relation to cycles.			Students relate duration to time.		
	Knowledge	Understanding	Skills & Procedures	Knowledge	Understanding	Skills & Procedures	Knowledge	Understanding	Skills & Procedures
	Words to describe a sequence in time can include • first • next • then • last • yesterday • today • tomorrow Ordinal numbers can indicate order in time.	Time can be perceived as a sequence.	Sequence events according to time using words or ordinal numbers. Describe daily events as occurring yesterday, today, or tomorrow.	Time can be perceived through observable change. First Nations, Métis, and Inuit experience time through sequences and cycles in nature, including cycles of seasons and stars. Cycles from a calendar include days of the week and months of the year.	Time is an experience of change. Time can be perceived as a cycle.	Describe cycles of time encountered in daily routines and nature. Describe observable changes that indicate a cycle of time. Relate cycles of seasons and stars to First Nations, Métis, or Inuit practices. Identify cycles from a calendar.	Events can be related to calendar dates. Comparative language for describing duration can include • longer • shorter • sooner • later Duration can be measured in non-standard units, including events, natural cycles, or personal referents.	Time can be communicated in various ways. Duration is the measure of an amount of time from beginning to end. Duration can be measured in various units according to context.	Express significant events using calendar dates. Describe the duration between or until significant events using comparative language. Describe the duration of events using non-standard units. Relate First Nations' winter counts to duration.
							Standard units of time can include • years • months • weeks • days • hours • minutes • seconds	Duration is quantified by measurement.	Describe the relationship between days, weeks, months, and years. Describe the duration between or until significant events using standard units of time.

	Kindergarten			Grade 1			Grade 2		
Organizing Idea				Statistics: The science of collecting, analyzing, visualizing, and interpreting data can inform understanding and decision making.					
Guiding Question				How can we use data as we wonder about our world?			How can data inform representation?		
Learning Outcome				Students acquire an understanding of data.			Students relate data to representation.		
				Knowledge	Understanding	Skills & Procedures	Knowledge	Understanding	Skills & Procedures
				Data can be collected information.	Data can be answers to questions.	Share wonderings about people, things, events, or experiences. Pose questions about people, things, events, or experiences in the learning environment. Gather data by sharing answers to questions.	Data can be collected by conducting a survey. First-hand data is data collected by the person using the data.	Data can be collected to answer questions.	Generate questions for a specific investigation within the learning environment. Collect first-hand data by questioning people within the learning environment.
				A graph is a visual representation of data. A graph can represent data by using objects, pictures, or numbers.	Data can be represented in a graph.	Collaborate to construct a concrete graph using data collected in the learning environment. Create a pictograph from a concrete graph.	Data can be recorded using tally marks, words, or counts. Graphs can include • pictographs • bar graphs • dot plots Data can be expressed through First Nations, Métis, or Inuit stories. A graph can include features such as • a title • a legend • axes • axis labels	Data can be represented in various ways.	Record data in a table. Construct graphs to represent data. Compare the features of pictographs, dot plots, and bar graphs.

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	Grade 3			Grade 4		
Organizing Idea	Number: Quantity is measured with numbers that enable counting, labelling, comparing, and operating.					
Guiding Question	How can place value support our organization of number?			How can place value facilitate our interpretation of number?		
Learning Outcome	Students interpret place value.			Students apply place value to decimal numbers.		
	Knowledge	Understanding	Skills & Procedures	Knowledge	Understanding	Skills & Procedures
	For numbers in base-10, each place has 10 times the value of the place to its right. The digits 0 to 9 indicate the number of groups in each place in a number. The value of each place in a number is the product of the digit and its place value. Numbers can be composed in various ways using place value. Numbers can be rounded in context when an exact count is not needed. A zero in the leftmost place of a natural number does not change the value of the number. The dollar sign, $, is placed to the left of the dollar value in English and to the right of the dollar value in French. The cent sign, ¢, is placed to the right of the cent value in English and in French.	Place value is the basis for the base-10 system. Place value determines the value of a digit based on its place in a number, relative to the ones place. Place value is used to read and write numbers.	Identify the place value of each digit in a natural number. Relate the values of adjacent places. Determine the value of each digit in a natural number. Express natural numbers using words and numerals. Express various compositions of a natural number using place value. Round natural numbers to various places. Compare and order natural numbers. Count and represent the value of a collection of nickels, dimes, and quarters as cents. Count and represent the value of a collection of loonies, toonies, and bills as dollars. Compare French and English symbolic representations of monetary values.	For numbers in base-10, each place has one-tenth the value of the place to its left. Multiplying or dividing a number by 10 corresponds to moving the decimal point one position to the right or left, respectively. A point is used for decimal notation in English. A comma is used for decimal notation in French. Numbers, including decimal numbers, can be composed in various ways using place value. A zero placed to the right of the last digit in a decimal number does not change the value of the number. The word *and* is used to indicate the decimal point when reading a number.	Decimal numbers are numbers between natural numbers. Decimal numbers are fractions with denominators of 10, 100, etc. The separation between wholes and parts can be represented using decimal notation. Patterns in place value are used to read and write numbers, including wholes and parts.	Identify the place value of each digit in a number, including tenths and hundredths. Relate the values of adjacent places, including tenths and hundredths. Relate place value to multiplication by 10 and division by 10. Determine the value of each digit in a number, including tenths and hundredths. Express numbers, including decimal numbers, using words and numerals. Express various compositions of a number, including decimal numbers, using place value. Compare decimal notation expressed in English and in French. Round numbers to various places, including tenths. Compare and order numbers, including decimal numbers. Express a monetary value in cents as a monetary value in dollars using decimal

	Grade 3			Grade 4		
						notation.

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	Grade 3			Grade 4		
Organizing Idea	Number: Quantity is measured with numbers that enable counting, labelling, comparing, and operating.					
Guiding Question	How can we establish processes for addition and subtraction?			How can we extend our understanding of addition and subtraction to decimal numbers?		
Learning Outcome	Students apply addition and subtraction within 1000.			Students add and subtract within 10 000, including decimal numbers to hundredths.		
	Knowledge	Understanding	Skills & Procedures	Knowledge	Understanding	Skills & Procedures
	Recall of addition and subtraction number facts facilitates addition and subtraction strategies. Estimation can be used when an exact sum or difference is not needed and to check if an answer is reasonable. Standard algorithms for addition and subtraction are conventional procedures based on place value.	Addition and subtraction strategies can be chosen based on the nature of the numbers. Standard algorithms are universal tools for addition and subtraction and may be used for any natural numbers independently of their nature.	Add and subtract natural numbers. Estimate sums and differences. Model regrouping by place value for addition and subtraction. Explain the standard algorithms for addition and subtraction of natural numbers. Add and subtract natural numbers using standard algorithms. Solve problems using addition and subtraction.	Standard algorithms for addition and subtraction of decimal numbers are conventional procedures based on place value. Estimation can be used to verify a sum or difference.	Standard algorithms are universal tools for addition and subtraction and may be used for any decimal numbers independently of their nature.	Add and subtract numbers, including decimal numbers, using standard algorithms. Assess the reasonableness of a sum or difference by estimating. Solve problems using addition and subtraction, including problems involving money.

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	Grade 3			Grade 4		
Organizing Idea	Number: Quantity is measured with numbers that enable counting, labelling, comparing, and operating.					
Guiding Question	How can multiplication and division provide new perspectives of number?			How can we interpret multiplication and division?		
Learning Outcome	Students acquire an understanding of multiplication and division within 100.			Students explain multiplication and division within 10 000, including with standard algorithms for multiplication and division of 3-digit by 1-digit natural numbers		
	Knowledge	Understanding	Skills & Procedures	Knowledge	Understanding	Skills & Procedures
	Multiplication and division are inverse mathematical operations. Multiplication is repeated addition. Multiplication by two is doubling and multiplication by three is tripling. Division is a process of sharing or grouping to find a quotient. The order in which two quantities are multiplied does not affect the product (commutative property). The order in which two numbers are divided affects the quotient. Multiplication or division by 1 results in the same number (identity property).	Quantities can be composed and decomposed through multiplication and division.	Compose a product using equal groups of objects. Relate multiplication to repeated addition. Relate multiplication to skip counting. Investigate multiplication by 0. Model a quotient by partitioning a quantity into equal groups with or without remainders. Visualize and model products and quotients as arrays.	A factor of a number is a divisor of that number. A prime number has factors of only itself and one. A composite number has other factors besides one and itself. Zero and one are neither prime nor composite. A number is a multiple of any of its factors. Prime factorization represents a number as a product of prime numbers. The order in which three or more numbers are multiplied does not affect the product (associative property). The order in which numbers are divided affects the quotient. Numbers can be multiplied or divided in parts (distributive property).	A product can be composed in multiple ways. Any natural number can be represented uniquely as a product of prime numbers, including repeated prime numbers. Any factor of a number can be determined from its prime factorization.	Determine the factors of a number. Describe a number as prime or composite. Recognize multiples of numbers within 100. Determine the greatest common factor (greatest common divisor) of two numbers. Compose a product in multiple ways, including with more than two factors. Represent composite numbers as products of prime numbers. Relate composite factors of a number to its prime factorization. Compare the prime factorization of two natural numbers.

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	Grade 3			Grade 4		
	Multiplication strategies include • repeated addition • multiplying in parts • compensation Division strategies include • repeated subtraction • partitioning the dividend The multiplication symbol is ×. The division symbol is ÷. The equal sign is =. A remainder is the quantity left over after division.	Sharing and grouping situations can be interpreted as multiplication or division. Multiplication and division strategies can be supported by addition and subtraction.	Investigate multiplication and division strategies. Multiply and divide within 100. Express multiplication and division symbolically. Explain the meaning of the remainder in various situations. Solve problems using multiplication and division in sharing or grouping situations.	Recall of multiplication and division number facts facilitates multiplication and division strategies. Standard algorithms facilitate multiplication and division of natural numbers that have multiple digits.	Multiplication and division strategies can be chosen based on the nature of the numbers.	Recall and apply multiplication number facts, with factors to 12, and related division number facts. Multiply and divide 3-digit natural numbers by 1-digit natural numbers using personal strategies. Examine standard algorithms for multiplication and division. Multiply and divide 3-digit natural numbers by 1-digit natural numbers using standard algorithms. Express a quotient with or without a remainder according to context. Solve problems using multiplication and division.
	A multiplication table shows both multiplication and division facts. Fact families are groups of related multiplication and division number facts.	Multiplication number facts have related division facts.	Examine patterns in multiplication and division, including patterns in multiplication tables and skip counting. Recognize families of related multiplication and division number facts. Recall multiplication number facts, with factors to 10, and related division facts.			

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	Grade 3			Grade 4		
Organizing Idea	Number: Quantity is measured with numbers that enable counting, labelling, comparing, and operating.					
Guiding Question	How can fractions contribute to our sense of number?			In what ways can we work flexibly with fractions?		
Learning Outcome	Students interpret fractions as part-whole relationships.			Students apply equivalence to the interpretation of proper and improper fractions.		
	Knowledge	Understanding	Skills & Procedures	Knowledge	Understanding	Skills & Procedures
	Fraction notation, $\left(\frac{a}{b}\right)$, relates the the numerator, a, as a number of equal parts, to the denominator, b, as the total number of equal parts in the whole. A whole quantity can be a whole set of objects or a whole object that can be partitioned. Each fraction is associated with a point on the number line.	Fractions are numbers between natural numbers. Fractions can represent part-to-whole relationships.	Partition a whole into 12 or fewer equal parts. Describe a whole as a fraction, limited to denominators of 12 or less. Model fractions of a whole, limited to denominators of 12 or less. Express fractions symbolically. Relate a fraction less than one to its position on the number line, limited to denominators of 12 or less. Compare fractions to benchmarks of $0, \frac{1}{2},$ and 1.	Fractions and decimal numbers that represent the same number are associated with the same point on the number line.	Fractions and decimal numbers can represent the same number. Decimal numbers are fractions with denominators of 10, 100, etc.	Relate fractions to decimal numbers, limited to tenths and hundredths. Relate fractions and equivalent decimal numbers, limited to tenths and hundredths, to their positions on the number line.
	The whole can be any size and is designated by context. Fractions can be compared by considering the number of parts or the size of parts.	Fractions are interpreted relative to the whole. The size of the parts and the number of partitions in the whole are inversely related.	Recognize the whole to which a fraction refers in various situations. Compare the same fraction of different-sized wholes. Compare different fractions with the same denominator. Compare different fractions with the same numerator.	Equivalent fractions are associated with the same point on the number line. Multiplication by 1 results in equivalent fractions. Division by 1 results in equivalent fractions. The numerator and denominator of a fraction in simplest form have no common factors. The most efficient way to express a fraction in simplest form is using the greatest common factor of the numerator and denominator.	There are infinitely many equivalent fractions that represent the same number. Exactly one of infinitely many equivalent fractions is in simplest form.	Model equivalent fractions by partitioning a whole in multiple ways. Represent fractions equivalent to a given fraction symbolically. Relate the position of equivalent fractions on the number line. Relate multiplying the numerator and denominator of a fraction by the same number to multiplying by 1. Recognize a fraction where the numerator and denominator have a common factor. Relate dividing the numerator and denominator of a fraction by the same number to dividing by 1. Express a fraction in simplest form.

	Grade 3			Grade 4	
			Fractions greater than one are called improper fractions and can be represented by a mixed number. Natural numbers can be expressed as improper fractions with a denominator of 1. Decimals can be expressed as fractions with the place value of the last non-zero digit of the decimal number as the denominator. Fractions can represent quotients. A fraction with the same numerator and denominator represents a quotient of 1.	Numbers greater than one can be expressed with fractions or decimal numbers.	Count beyond 1 using fractions with the same denominator and decimal numbers. Model improper fractions. Express improper fractions symbolically. Relate fractions, including improper fractions, and equivalent decimal numbers to their positions on the number line. Convert an improper fraction to a mixed number using division. Convert between fractions and decimal numbers. Compare and order fractions, including improper fractions.

Draft Mathematics Kindergarten to Grade 6 Curriculum

	Grade 3			Grade 4		
Organizing Idea	Number: Quantity is measured with numbers that enable counting, labelling, comparing, and operating.					
Guiding Question	How can the composition of fractions facilitate agility in operating with fractions?			How can we generalize the addition and subtraction of fractions?		
Learning Outcome	Students acquire an understanding of addition and subtraction of fractions with like denominators.			Students add and subtract positive fractions with like and unlike denominators.		
	Knowledge	Understanding	Skills & Procedures	Knowledge	Understanding	Skills & Procedures
	A unit fraction is any one part of a whole divided into equal parts. Fractions with common denominators are multiples of the same unit fraction.	Any fraction can be interpreted as a composition of unit fractions.	Decompose a fraction into unit fractions. Express a fraction as repeated addition of a unit fraction. Relate repeated addition of a unit fraction to multiplication of a natural number by a unit fraction. Add and subtract fractions within one whole, limited to common denominators of 12 or less. Solve problems involving fractions, limited to common denominators of 12 or less.	Adding and subtracting fractions is facilitated by expressing fractions with common denominators. The product of the denominators of two fractions provides a common denominator. The most efficient way to express two fractions with common denominators is using the least common multiple of the two denominators. Addition and subtraction of fractions can be used to solve problems in real-life situations, such as cooking and construction.	Any two fractions can be added or subtracted.	Recognize two fractions where the denominator of one fraction is a multiple of the other. Recognize two fractions where the denominators have a common factor or multiple. Express two fractions with common denominators. Add and subtract fractions. Solve problems using addition and subtraction of fractions.

Draft Mathematics Kindergarten to Grade 6 Curriculum

	Grade 3			Grade 4		
Organizing Idea	Algebra: Equations express relationships between quantities.					
Guiding Question	How can equality facilitate agility with number?			How can equality create opportunities to reimagine number?		
Learning Outcome	Students interpret equality with equations.			Students visualize and apply equality in multiple ways.		
	Knowledge	Understanding	Skills & Procedures	Knowledge	Understanding	Skills & Procedures
	The equal sign is not a signal to perform a given computation. The left and right sides of an equation are interchangeable.	An equation uses the equal sign to indicate equality between two expressions. Two expressions are equal if they represent the same number.	Write equations that represent equality between a number and an expression or between two different expressions of the same number.	Expressions are evaluated according to the conventional order of operations: • Multiplication and division are performed before addition and subtraction. • Multiplication and division are performed in order from left to right. • Addition and subtraction are performed in order from left to right.	There are infinitely many expressions that represent the same number.	Evaluate expressions according to the order of operations. Create various expressions of the same number using one or more operations.
	A symbol may represent an unknown value in an equation.	Equations can include unknown values.	Model equations that include an unknown value. Determine an unknown value on the left or right side of an equation, limited to equations with one operation. Solve problems using equations, limited to equations with one operation.	Equality is preserved when each side of an equation is changed in the same way (preservation of equality).	An equation is solved by determining the value of the symbol that makes the left and right sides of an equation equal.	Write equations to represent a situation involving one operation. Investigate preservation of equality by adding, subtracting, multiplying, or dividing the same number on both sides of an equation without an unknown value. Apply preservation of equality to determine an unknown value in an equation, limited to equations with one operation. Solve problems using equations, limited to equations with one operation.

Draft Mathematics Kindergarten to Grade 6 Curriculum

	Grade 3			Grade 4		
Organizing Idea	Geometry: Shapes are defined and related by geometric attributes.					
Guiding Question	In what ways might geometric properties refine our interpretation of shape?			In what ways can geometric properties define space?		
Learning Outcome	Students relate geometric properties to shape.			Students interpret and explain geometric properties.		
	Knowledge	Understanding	Skills & Procedures	Knowledge	Understanding	Skills & Procedures
	Geometric properties can describe relationships, including perpendicular, parallel, and equal. Parallel lines or planes are always the same distance apart. Perpendicular lines or planes intersect at a right angle. Familiar representations of a right angle may include • the corner of a piece of paper • the angle between the hands on an analog clock at 3:00 • a capital letter L Polygons include • triangles • quadrilaterals • pentagons • hexagons • octagons Regular polygons have sides of equal length and interior angles of equal measure.	Geometric properties are relationships between geometric attributes. Geometric properties define a class of polygon.	Investigate geometric properties within polygons. Describe geometric properties of regular and irregular polygons. Sort polygons according to geometric properties and describe the sorting rule. Classify polygons as regular or irregular using geometric properties.	Angle relationships, including supplementary and complementary, are geometric properties. Two angles that compose 90° are complementary angles. Two angles that compose 180° are supplementary angles. Quadrilaterals include • squares • rectangles • parallelograms • trapezoids • rhombuses Triangles can be classified according to side length as • equilateral • isosceles Triangles can be classified according to angle as • right • obtuse • acute	Geometric properties are measurable. Geometric properties define a hierarchy for classifying shapes.	Identify relationships between the sides of a polygon, including parallel, equal length, or perpendicular, by measuring. Identify relationships between angles within a polygon, including equal, supplementary, complementary, and sum of interior angles, by measuring. Identify relationships between the faces of three-dimensional models of prisms, including parallel or perpendicular, by measuring. Classify triangles as equilateral, isosceles, or neither using geometric properties related to sides. Classify triangles as right, acute, or obtuse using geometric properties related to angles. Classify quadrilaterals in a hierarchy according to geometric properties.
	Rigid transformations include • translations • rotations • reflections	Geometric properties do not change when a polygon undergoes rigid transformation.	Examine geometric properties of polygons by translating, rotating, or reflecting using hands-on materials or digital applications.	Many shapes in the environment resemble polygons. Rigid transformations can be used to illustrate geometric properties of a polygon.	A shape resembling a polygon that does not share the defining geometric properties of the polygon is a close approximation.	Show, using geometric properties, that a close approximation of a polygon is not the same as the polygon. Verify geometric properties of polygons by translating, rotating, or reflecting using hands-on materials or digital applications.

	Grade 3			Grade 4		
Organizing Idea	Measurement: Attributes such as length, area, volume, and angle are quantified by measurement.					
Guiding Question	In what ways can we communicate length?			How can area characterize space?		
Learning Outcome	Students explain length using standard units.			Students interpret and express area.		
	Knowledge	Understanding	Skills & Procedures	Knowledge	Understanding	Skills & Procedures
	The metric system is a base-10 system first adopted in France. The basic unit of length in the metric system is the metre. Metric units are named using prefixes that indicate the relationship to the basic unit (e.g., for length, the prefix centi- indicates there are 100 centimetres in a metre). Metric units are abbreviated for convenience (e.g., metre is abbreviated with m and centimetre is abbreviated with cm). Standard measuring tools show iterations of a standard unit from an origin. The Weights and Measures Act (RSC, 1985, c. W-6) identifies units adapted from the imperial system for use in Canada as "Canadian units." Canada	Length is measured in standard units according to the metric system. An alternative system, the imperial system, still partly in use, uses "Canadian units" (sometimes called "imperial units"). This system is important to know about because it provides core numeracy for current everyday life, understanding works of the past, and literacy concerning culture and trade with our biggest trading partner, the United States. Length can be expressed in various units according to context and desired precision. Length remains the same when decomposed or rearranged.	Relate the metric system to the place value system. Relate centimetres to metres. Justify the choice of centimetres or metres to measure various lengths. Measure lengths of straight lines and curves, with centimetres or metres, using a standard measuring tool. Express length in centimetres or metres. Convert commonly used units of measure between metric and Canadian (imperial) units within 100. Determine perimeter of polygons. Determine the length of an unknown side given the perimeter of a polygon.	Tiling is the process of measuring an area with many copies of a unit. Units that tile fit together without gaps or overlaps. The unit can be chosen based on the area to be measured. Area can be measured with non-standard units or standard units (e.g., square centimetres). The area of a rectangle equals the product of its perpendicular side lengths.	Area is a measurable attribute that describes the amount of two-dimensional space contained within a region. Area may be interpreted as the result of motion of a length. An area remains the same when decomposed or rearranged. Area is quantified by measurement. Area is measured with equal-sized units that themselves have area and do not need to resemble the region being measured. The area of a rectangle can be perceived as square-shaped units structured in a two-dimensional array.	Model area by dragging a length using hands-on materials or digital applications. Recognize the rearrangement of area in First Nations, Métis, or Inuit design. Compare non-standard units that tile to non-standard units that do not tile. Measure area with non-standard units by tiling. Measure area with standard units by tiling with a square centimetre. Visualize and model the area of various rectangles as two-dimensional arrays of square-shaped units. Determine the area of a rectangle using multiplication. Solve problems involving area of rectangles.

	Grade 3			Grade 4		
	and the United States use units derived from the imperial system of measurement, including • Length: mile, yard, foot, inch • Area: square mile, acre • Volume or capacity*: bushel, gallon, quart, pint, fluid ounce • Mass or weight: ton, pound, ounce *Note: In the United States, ounces are slightly bigger, and bushels, gallons, and pints are smaller. The perimeter of a polygon is the sum of the lengths of its sides.					
	A benchmark is a known length to which another length can be compared. A referent is a personal or familiar representation of a known length. A common referent for a metre is the distance from a doorknob to the floor.	Length can be estimated when less accuracy is required.	Identify referents for a centimetre and a metre. Estimate length by comparing to a benchmark of a centimetre or metre. Estimate length by visualizing the iteration of a referent for a centimetre or metre.	A common referent for a square centimetre is the area of the fingernail on the little finger.	Area can be estimated when less accuracy is required.	Identify referents for a square centimetre. Estimate an area by visualizing a referent for a square centimetre. Estimate an area by rearranging or combining partial units.

Draft Mathematics Kindergarten to Grade 6 Curriculum

	Grade 3			Grade 4		
Organizing Idea	Measurement: Attributes such as length, area, volume, and angle are quantified by measurement.					
Guiding Question				How can angle broaden our interpretation of space?		
Learning Outcome				Students interpret and express angle.		
				Knowledge	Understanding	Skills & Procedures
				Angle defines the space in • corners • bends • turns or rotations • intersections • slopes The arms of an angle can be line segments or rays. The end point of a line segment or ray is called a vertex.	An angle is the union of two arms with a common vertex. An angle can be interpreted as the motion of a length rotated about a vertex.	Recognize various angles in surroundings. Recognize situations in which an angle can be perceived as motion.
				Superimposing is the process of placing one angle over another to compare angles.	Two angles can be compared directly or indirectly with a third angle.	Compare two angles directly by superimposing. Compare two angles indirectly with a third angle by superimposing. Estimate which of two angles is greater.
				One degree represents $\frac{1}{360}$ of the rotation of a full circle. Angles can be classified according to their measure • acute angles measure less than 90° • right angles measure 90° • obtuse angles measure between 90° and 180° • straight angles measure 180°	Angle is quantified by measurement. Angle is measured with equal-sized units that themselves are angles. Angle measurement is based on the division of a circle.	Measure an angle with degrees using a protractor. Describe an angle as acute, right, obtuse, or straight. Relate angles of 90°, 180°, 270°, and 360° to fractions of a circle.

	Grade 3			Grade 4		
				A benchmark is a known angle to which another angle can be compared. A referent is a personal or familiar representation of a known angle.	Angle can be estimated when less accuracy is required.	Identify referents for 45°, 90°, 180°, 270°, and 360°. Estimate angles by comparing to benchmarks of 45°, 90°, 180°, 270°, and 360°. Estimate angles by visualizing referents for 45°, 90°, 180°, 270°, and 360°.

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	Grade 3			Grade 4		
Organizing Idea	Patterns: Awareness of patterns supports problem solving in various situations.					
Guiding Question	How can diverse representations of pattern contribute to our interpretation of change?			How can sequence provide insight into change?		
Learning Outcome	Students analyze pattern in numerical sequences.			Students interpret and explain arithmetic and geometric sequences.		
	Knowledge	Understanding	Skills & Procedures	Knowledge	Understanding	Skills & Procedures
	Ordinal numbers can indicate position in a sequence. Finite sequences, such as a countdown, have a definite end. Infinite sequences, such as the natural numbers, never end.	A sequence is a list of terms arranged in a certain order. Sequences may be finite or infinite.	Recognize familiar numerical sequences, including the sequence of even or odd numbers. Describe position in a sequence using ordinal numbers. Differentiate between finite and infinite sequences.	The sequences of triangular and square numbers are examples of increasing sequences. The Fibonacci sequence is an increasing sequence that occurs in nature.	Sequences may increase or decrease. Different representations can provide new perspectives of the increase or decrease of a sequence.	Investigate increasing sequences, including the Fibonacci sequence, in multiple representations. Create and explain increasing or decreasing sequences, including numerical sequences. Express a numerical sequence to represent a concrete or pictorial sequence.
	Numerical sequences can be constructed using addition, subtraction, multiplication, or division.	A sequence can progress according to a pattern.	Recognize skip-counting sequences in various representations, including rows or columns of a multiplication table. Determine any missing term in a skip-counting sequence using multiplication. Describe the change from term to term in a numerical sequence using mathematical operations. Guess the next term in a sequence by inferring the pattern from the previous terms.	An arithmetic sequence progresses through addition or subtraction. A skip-counting sequence is an example of an arithmetic sequence. A geometric sequence progresses through multiplication. A geometric sequence begins at a number other than zero.	An arithmetic sequence has a constant difference between consecutive terms. A geometric sequence has a constant ratio between consecutive terms.	Recognize arithmetic and geometric sequences. Describe the initial term and the constant change in an arithmetic sequence. Express the first five terms of an arithmetic sequence related to a given initial term and constant change. Describe the initial term and the constant change in a geometric sequence. Express the first five terms of a geometric sequence related to a given initial term and constant change.

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	Grade 3			Grade 4		
Organizing Idea	Time: Duration is described and quantified with time.					
Guiding Question	How can we communicate duration?			What might be the relevance of duration to daily living?		
Learning Outcome	Students tell time using clocks.			Students communicate duration with standard units of time.		
	Knowledge	Understanding	Skills & Procedures	Knowledge	Understanding	Skills & Procedures
	Clocks relate seconds to minutes and hours according to a base-60 system. The basic unit of time is the second. One second is $\frac{1}{60}$ of a minute. One minute is $\frac{1}{60}$ of an hour. Analog and digital clocks represent time of day. Time of day can be expressed as a duration relative to 12:00 in two 12-hour cycles. Time of day can be expressed as a duration relative to 0:00 in one 24-hour cycle in some contexts, including French-language contexts.	Clocks are standard measuring tools used to communicate time.	Investigate relationships between seconds, minutes, and hours using an analog clock. Relate minutes past the hour to minutes until the next hour. Describe time of day as a.m. or p.m. relative to 12-hour cycles of day and night. Tell time using analog and digital clocks. Express time of day in relation to one 24-hour cycle according to context.	Time of day can be expressed with fractions of a circle, including • quarter past the hour • half past the hour • quarter to the hour Duration can be determined by finding the difference between a start time and an end time.	Analog clocks can relate duration to a circle.	Relate durations of 15 minutes, 20 minutes, 30 minutes, 40 minutes, and 45 minutes to fractions of a circle. Express time of day using fractions. Determine duration in minutes using a clock. Apply addition and subtraction strategies to the calculation of duration. Convert between hours, minutes, and seconds. Compare the duration of events using standard units. Solve problems involving duration.

Draft Mathematics Kindergarten to Grade 6 Curriculum

	Grade 3			Grade 4		
Organizing Idea	Statistics: The science of collecting, analyzing, visualizing, and interpreting data can inform understanding and decision making.					
Guiding Question	How can representation support communication?			In what ways can we shape communication with our choice of representation?		
Learning Outcome	Students interpret and explain representation.			Students apply and evaluate representation with scale.		
	Knowledge	Understanding	Skills & Procedures	Knowledge	Understanding	Skills & Procedures
	Statistical questions are questions that can be answered by collecting data.	Representation connects data to a statistical question.	Formulate statistical questions for investigation. Predict the answer to a statistical question.	A statistical problem-solving process includes • formulating statistical questions • collecting data • representing data • interpreting data	Representation is part of a statistical problem-solving process.	Engage in a statistical problem-solving process.
	Second-hand data is data collected by others. Sources of second-hand data include • newspapers • maps • databases • websites • social media • stories	Representation expresses data specific to a unique time and place. Representation tells a story about data.	Collect second-hand data using digital or non-digital tools and resources. Represent second-hand data in a dot plot or bar graph with one-to-one correspondence. Describe the story that a representation tells about a collection of data in relation to a statistical question. Examine First Nations, Métis, or Inuit representations of data. Consider possible answers to a statistical question based on the data collected.	Many-to-one correspondence is the representation of many objects using one object or interval on a graph. Graphs can include • pictographs • bar graphs • dot plots	Representation can express many-to-one correspondence by defining a scale. Different representations tell different stories about the same data.	Select an appropriate scale to represent data. Represent data in a graph using many-to-one correspondence. Describe the effect of scale on representation. Justify the choice of graph used to represent certain data. Compare different graphs of the same data. Interpret data represented in various graphs.

Draft Mathematics Kindergarten to Grade 6 Curriculum

	Grade 5			Grade 6		
Organizing Idea	Number: Quantity is measured with numbers that enable counting, labelling, comparing, and operating.					
Guiding Question	How can the infinite nature of place value enhance our insight into number?			How can the infinite nature of the number line broaden our perception of number?		
Learning Outcome	Students analyze patterns in place value.			Students acquire an understanding of magnitude and operations with positive and negative numbers.		
	Knowledge	Understanding	Skills & Procedures	Knowledge	Understanding	Skills & Procedures
	A number expressed with more decimal places is more precise. A zero in the rightmost place of a decimal number does not change the value of the number.	Place value symmetry extends infinitely to the left and right of the ones place. There are infinitely many decimal numbers between any two decimal numbers.	Relate the names of place values that are the same number of places to the left and right of the ones place. Express numbers, including decimal numbers, using words and numerals. Relate a decimal number to its position on the number line. Determine a decimal number between any two other decimal numbers. Compare and order numbers, including decimal numbers. Round numbers, including decimal numbers, to various places according to context.	Negative numbers are to the left of zero on the number line visualized horizontally, and below zero on the number line visualized vertically. Positive numbers can be represented symbolically with or without a positive sign (+). Negative numbers are represented symbolically with a negative sign (-). Zero is neither positive nor negative. Negative numbers communicate meaning in context, including • temperature • debt • elevation Magnitude is a number of units counted or measured from zero on the number line. Every positive number has an opposite negative number with the same magnitude. A number and its opposite are called additive inverses. The additive inverse of a negative number	Symmetry of the number line extends infinitely to the left and right of zero. Direction relative to zero is indicated symbolically with a polarity sign. Magnitude with direction distinguishes between positive and negative numbers.	Identify negative numbers in familiar contexts, including contexts that use vertical or horizontal models of the number line. Express positive and negative numbers symbolically, in context. Relate magnitude to the distance from zero on the number line. Relate positive and negative numbers, including additive inverses, to their positions on horizontal and vertical models of the number line. Compare and order positive and negative numbers, including fractions and decimals.

	Grade 5			Grade 6		
				is positive.		
				The set of integers includes all natural numbers, their additive inverses, and zero. The sum of any number and its additive inverse is zero. The sum of two positive numbers is a positive number. The sum of two negative numbers is a negative number. The sum of a positive number and a negative number can be interpreted as the sum of zero and another number.	Any number can be expressed as a sum in infinitely many ways.	Investigate addition of an integer and its additive inverse. Express zero as sum of intergers in multiple ways. Model the sum of two positive integers. Model the sum of two negative integers. Model the sum of a positive and negative integer as the sum of zero and another integer. Add any two integers.
				Subtracting a number is the same as adding its additive inverse.	The difference of any two numbers can be interpreted as a sum.	Express a difference as a sum. Add any two numbers, including positive or negative fractions or decimals.
				The product or quotient of two positive numbers is a positive number. The product or quotient of two negative numbers is a positive number. The product or quotient of a negative number and a positive number is a negative number.	Any product can be composed of positive and negative numbers.	Investigate situations involving the multiplication or division of positive and negative numbers. Generalize a rule to determine the polarity sign for the product of two or more integers. Multiply any two numbers, including positive or negative fractions or decimals. Divide any two numbers, including positive or negative fractions or decimals.

Draft Mathematics Kindergarten to Grade 6 Curriculum

	Grade 5			Grade 6		
Organizing Idea	Number: Quantity is measured with numbers that enable counting, labelling, comparing, and operating.					
Guiding Question	In what ways can we articulate the processes of addition and subtraction?			How can we apply the processes of addition and subtraction to problem solving?		
Learning Outcome	Students add and subtract within 1 000 000, including decimal numbers to thousandths, using standard algorithms.			Students solve problems using standard algorithms for addition and subtraction.		
	Knowledge	Understanding	Skills & Procedures	Knowledge	Understanding	Skills & Procedures
	Standard algorithms are efficient procedures for addition and subtraction.	Addition and subtraction of numbers with many digits is facilitated by standard algorithms.	Add and subtract numbers, including decimal numbers, using standard algorithms. Assess the reasonableness of a sum or difference by estimating. Solve problems using addition and subtraction, including problems involving money.	Standard algorithms are reliable procedures for addition and subtraction. Contexts for problems involving addition and subtraction can include money and metric measurement.	Addition and subtraction of numbers in problem-solving contexts is facilitated by standard algorithms.	Solve problems in various contexts using standard algorithms for addition and subtraction.

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	Grade 5			Grade 6		
Organizing Idea	Number: Quantity is measured with numbers that enable counting, labelling, comparing, and operating.					
Guiding Question	In what ways can we articulate the processes of multiplication and division?			How can we apply the processes of multiplication and division to decimal numbers?		
Learning Outcome	Students multiply 3-digit by 2-digit natural numbers and divide 3-digit by 1-digit natural numbers using standard algorithms.			Students apply standard algorithms to multiplication and division of 3-digit natural or decimal numbers by 2-digit natural numbers.		
	Knowledge	Understanding	Skills & Procedures	Knowledge	Understanding	Skills & Procedures
	Standard algorithms are efficient procedures for multiplication and division.	Multiplication and division of numbers with many digits is facilitated by standard algorithms.	Explain the standard algorithms for multiplication and division of natural numbers. Multiply and divide natural numbers using standard algorithms. Express a quotient with or without a remainder according to context. Assess the reasonableness of a product or quotient by estimating. Solve problems using multiplication and division of natural numbers.	Standard algorithms are reliable procedures for multiplication and division of numbers, including decimal numbers. A quotient with a remainder can be expressed as a decimal number.	Multiplication and division of decimal numbers is facilitated by standard algorithms.	Explain the standard algorithms for multiplication and division of decimal numbers. Multiply and divide numbers, including decimal numbers, using standard algorithms. Assess the reasonableness of a product or quotient by estimating. Solve problems using multiplication and division, including problems involving money.

Draft Mathematics Kindergarten to Grade 6 Curriculum

	Grade 5			Grade 6		
Organizing Idea	Number: Quantity is measured with numbers that enable counting, labelling, comparing, and operating.					
Guiding Question	How can percentages standardize part-whole relationships?			How can ratios provide new ways to relate numbers?		
Learning Outcome	Students interpret percentages.			Students interpret ratios.		
	Knowledge	Understanding	Skills & Procedures	Knowledge	Understanding	Skills & Procedures
	Percentage is represented symbolically with %. Decimals can be expressed as percentages by multiplying by 100. Percentages can be expressed as decimals by dividing by 100.	Fractions, decimals, and percentages can represent the same part-whole relationship. One percent represents one hundredth of a whole.	Investigate percentage in familiar situations. Model the same part-whole relationship as a fraction, decimal, and percentage. Express the same part-whole relationship as a fraction, decimal, and percentage symbolically. Compare percentages within 100%.	A ratio can relate any two countable or measurable quantities, including • a part to a part • a part to the whole A ratio can be expressed with a fraction or with a colon. A proportion is an expression of equivalence between two ratios. A percentage represents the ratio of a number to 100. Percent of a number can be determined by mutliplying the number by the percent and dividing by 100.	A ratio is a comparison of two quantities. There are infinitely many equivalent ratios. Fractions, decimals, ratios, and percentages can represent the same part-whole relationship.	Express part-part ratios and part-whole ratios of the same whole to describe various situations. Express a ratio as a fraction, decimal, and percentage symbolically. Express two equivalent ratios as a proportion. Relate percentage of a number to a proportion. Find a percent of a number, limited to percents within 100%.

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	Grade 5			Grade 6		
Organizing Idea	Number: Quantity is measured with numbers that enable counting, labelling, comparing, and operating.					
Guiding Question	How can we extend our understanding of multiplication to fractions?			How can we generalize the multiplication and division of fractions?		
Learning Outcome	Students interpret the multiplication of natural numbers by fractions.			Students multiply and divide positive fractions.		
	Knowledge	Understanding	Skills & Procedures	Knowledge	Understanding	Skills & Procedures
	Multiplication of a natural number by a fraction is equivalent to multiplication by its numerator and division by its denominator. $$a \times \frac{b}{c} = \frac{ab}{c}$$ Multiplication by a unit fraction is equivalent to division by its denominator. $$a \times \frac{1}{b} = \frac{a}{b}$$ The product of a fraction and a natural number is the fraction with • a numerator that is the product of the numerator of the given fraction and the natural number • a denominator that is the denominator of the given fraction $$\frac{a}{b} \times c = \frac{ac}{b}$$	Multiplication does not always result in a larger number. Multiplication of a natural number by a fraction can be interpreted as repeated addition of the fraction. Multiplication of a fraction by a natural number can be interpreted as taking part of a quantity.	Investigate multiplication of a natural number by a fraction as repeated addition of the fraction. Relate multiplication of a natural number by a fraction to repeated addition of the fraction. Multiply a natural number by a fraction. Model a unit fraction of a natural number. Relate multiplication by a unit fraction to division. Multiply a unit fraction by a natural number. Model a fraction of a natural number. Multiply a fraction by a natural number. Solve problems using addition and subtraction of fractions and multiplication of a fraction and a natural number.	The product of two fractions is the fraction with • a numerator that is the product of the numerators of the given fractions • a denominator that is the product of the denominators of the given fractions $$\frac{a}{b} \times \frac{c}{d} = \frac{ac}{bd}$$ A reciprocal is the multiplicative inverse of a fraction. The reciprocal of a fraction is the fraction obtained by interchanging the numerator and the denominator. The product of a fraction and its reciprocal is 1. The reciprocal of a natural number is a unit fraction. The reciprocal of a reciprocal is the original fraction. A fraction less than one has a reciprocal greater than one. A fraction greater than one has a reciprocal less than one.	Multiplication of a fraction by a fraction can be interpreted as taking part of a partial quantity. Division of fractions can be interpreted using multiplication.	Model a fraction of a fraction. Multiply a fraction by a fraction. Identify the reciprocal of a given fraction. Investigate multiplication of a fraction by its reciprocal. Divide a fraction by a fraction. Solve problems using operations with fractions.

	Grade 5				Grade 6	
				Division by a fraction is equivalent to multiplication by its reciprocal. Division by a fraction can be computed using the formula $$\frac{a}{b} \div \frac{c}{d} = \frac{a}{b} \times \frac{d}{c}$$		

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	Grade 5			Grade 6		
Organizing Idea	Algebra: Equations express relationships between quantities.					
Guiding Question	How can expressions enhance communication of number?			How can expressions support a generalized interpretation of number?		
Learning Outcome	Students interpret numerical and algebraic expressions.			Students analyze expressions and solve algebraic equations.		
	Knowledge	Understanding	Skills & Procedures	Knowledge	Understanding	Skills & Procedures
	Expressions composed only of numbers are called numerical expressions. Numerical expressions are evaluated according to the conventional order of operations: • Operations in parentheses are performed before other operations. • Multiplication and division are performed before addition and subtraction. • Multiplication and division are performed in order from left to right. • Addition and subtraction are performed in order from left to right.	Numerical expressions represent a quantity of known value. Parentheses change the order of operations in a numerical expression.	Evaluate numerical expressions involving addition or subtraction in parentheses according to the order of operations.	The product of a number of identical factors can be expressed as a power (e.g., $5 \times 5 \times 5 = 5^3$). A power uses a base to represent the identical factor and an exponent to indicate the number of identical factors. Any repeated prime factor within a prime factorization can be expressed as a power (e.g., 40 can be expressed as $2 \times 2 \times 2 \times 5$ or $2^3 \times 5$). Numerical expressions are evaluated according to the conventional order of operations: • Operations in parentheses are performed before other operations. • Powers are evaluated before other operations are performed. • Multiplication and division are performed before addition and subtraction. • Multiplication and division are performed in order from left to right. • Addition and subtraction are performed in order from left to right.	Numerical expressions can include powers.	Express repeated multiplication as a power. Express repeated prime factors within a prime factorization as a power. Evaluate numerical expressions involving operations in parentheses and powers according to the order of operations.

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	Expressions that include variables are called algebraic expressions. A variable can be interpreted as a specific unknown value and is represented symbolically with a letter. Products with variables are expressed without the multiplication sign. Quotients with variables are expressed using fraction notation. An algebraic term is the product of a number, called a coefficient, and a variable. A constant term is a number.	Algebraic expressions use variables to represent quantities of unknown value. Algebraic expressions may be composed of one algebraic term or the sum of algebraic and constant terms.	Relate repeated addition of a variable to the product of a number and a variable. Express the product of a number and a variable using a coefficient. Express the quotient of a variable and a number as a fraction. Recognize a product with a variable, a quotient with a variable, or a number as a single term. Recognize the sum of an algebraic term and a constant term as two distinct terms. Write an algebraic expression involving one or two terms to describe an unknown value. Evaluate an algebraic expression by substituting a given number for the variable.	Algebraic terms with exactly the same variable are like terms. Constant terms are like terms. Like terms can be combined through addition or subtraction. The terms of an algebraic expression can be rearranged according to algebraic properties. Algebraic properties include • commutative property of addition: $a + b = b + a$, for any two numbers a and b • commutative property of multiplication: $ab = ba$, for any two numbers a and b • associative property of addition: $(a + b) + c = a + (b + c)$ • associative property of multiplication: $a(bc) = b(ac)$ • distributive property: $a(b + c) = ab + ac$	There are infinitely many ways to express equivalent algebraic expressions. Algebraic properties ensure equivalence of algebraic expressions.	Investigate like terms by modelling an algebraic expression. Simplify algebraic expressions by combining like terms. Express the terms of an algebraic expression in a different order in accordance with algebraic properties.
	The process of applying inverse operations can be used to solve an equation.	Equality is preserved by applying inverse operations to algebraic expressions on each side of an equation.	Write equations involving one or two operations to represent a situation. Investigate order of operations when performing inverse operations on both sides of an equation. Apply inverse operations to solve an equation, limited to equations with one or two operations. Solve problems using equations, limited to equations with one or two operations.	The equation that shows equality between the variable and a number can be interpreted as the solution.	Algebraic expressions on each side of the equation can be simplified into equivalent expressions to facilitate equation solving.	Simplify algebraic expressions on both sides of an equation. Solve equations, limited to equations with one or two operations. Compare strategies for solving equations. Solve problems using equations, limited to equations with one or two operations.

Draft Mathematics Kindergarten to Grade 6 Curriculum

	Grade 5			Grade 6		
Organizing Idea	Geometry: Shapes are defined and related by geometric attributes.					
Guiding Question	In what ways might symmetry characterize shape?			How can congruence support our interpretation of symmetry?		
Learning Outcome	Students interpret symmetry as a geometric property.			Students relate shapes through symmetry and congruence.		
	Knowledge	Understanding	Skills & Procedures	Knowledge	Understanding	Skills & Procedures
	A 2-D shape has reflection symmetry if there is a line over which the shape reflects and the two halves exactly match. A line of symmetry can be any straight line, including a horizontal or vertical line. A 3-D shape has reflection symmetry if there is a plane over which the shape reflects and the two halves exactly match. A 2-D shape has rotation symmetry if it exactly overlaps itself one or more times within a rotation of less than 360° around its centre point. Order of rotation symmetry describes the number of times a shape coincides with itself within a rotation of 360° around its centre point. Central symmetry is the rotational symmetry by 180°. It may be viewed as symmetry through the centre. The straight line that connects a point with	Symmetry is a property of shapes. Symmetry can be created and can occur in nature.	Recognize symmetry in nature. Recognize symmetry in First Nations, Métis, and Inuit design. Investigate symmetry in familiar 2-D and 3-D shapes using hands-on materials or digital applications. Show the line of symmetry of a 2-D shape. Describe the order of rotation symmetry of a 2-D shape.	Symmetrical shapes can be mapped by any combination of reflections and rotations. The tiling of a plane with symmetrical shapes is called a tessellation.	Symmetry is a relationship between two shapes that can be mapped exactly onto each other through reflection or rotation.	Verify symmetry of two shapes by reflecting or rotating one shape onto another. Describe the symmetry between two shapes as reflection symmetry or rotation symmetry. Visualize and describe a combination of two rigid transformations that relate symmetrical shapes. Describe the symmetry modelled in a tessellation.

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	its image in the central symmetry passes through the centre. Symmetry can be found in First Nations, Métis, and Inuit design, including • weavings • quilts • beading • architecture such as tipis or longhouses					
	A regular polygon has the same number of sides, reflection symmetries, and rotation symmetries. A circle has infinitely many reflection and rotation symmetries.	Symmetry is related to other geometric properties.	Compare the number of reflection and rotation symmetries of a 2-D shape to the number of equal sides and angles. Classify 2-D shapes according to the number of reflection or rotation symmetries.	Shapes related by symmetry are congruent to each other. Congruent shapes may not be related by symmetry.	Congruence is a relationship between two shapes of identical size and shape. Congruence is not dependent on orientation or location of the shapes.	Demonstrate congruence between two shapes in any orientation by superimposing using hands-on materials or digital applications. Describe symmetrical shapes as congruent.

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	Grade 5			Grade 6		
Organizing Idea	Coordinate Geometry: Location and movement of objects in space can be communicated using a coordinate grid.					
Guiding Question	How can location enhance the ways in which we define space?			In what ways can we communicate location?		
Learning Outcome	Students interpret location in relation to position on a grid.			Students explain location in relation to position in the Cartesian plane.		
	Knowledge	Understanding	Skills & Procedures	Knowledge	Understanding	Skills & Procedures
	Coordinate grids use coordinates to indicate the location of the point where the vertical and horizontal grid lines intersect. Coordinates are ordered pairs of numbers in which the first number indicates the distance from the vertical axis and the second number indicates the distance from the horizontal axis. Positional language includes • left • right • up • down	Location can describe the position of shapes in space. Location can be described precisely using a coordinate grid.	Locate a point on a coordinate grid given the coordinates of the point. Describe the location of a point on a coordinate grid using coordinates. Describe the location of a point on a coordinate grid in relation to the location of another point using positional language. Model a polygon on a coordinate grid using coordinates to indicate the vertices. Describe the location of the vertices of a polygon on a coordinate grid using coordinates.	The Cartesian plane is named after French mathematician René Descartes. The Cartesian plane uses coordinates,(x, y), to indicate the location of the point where the vertical line passing through $(x, 0)$ and the horizontal line passing through $(0, y)$ intersect. The x-axis consists of those points whose y-coordinate is zero and the y-axis consists of those points whose x-coordinate is zero. The x-axis and the y-axis intersect at the origin, $(0, 0)$. An ordered pair is represented symbolically as (x, y). An ordered pair indicates the horizontal distance from the y-axis with the x-coordinate and the vertical distance from the x-axis with the y-coordinate.	Location can be described using the Cartesian plane. The Cartesian plane is the two-dimensional equivalent of the number line.	Relate the axes of the Cartesian plane to intersecting horizontal and vertical representations of the number line. Locate a point in the Cartesian plane given the coordinates of the point. Describe the location of a point in the Cartesian plane using coordinates. Model a polygon in the Cartesian plane using coordinates to indicate the vertices. Describe the location of the vertices of a polygon in the Cartesian plane using coordinates.

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			A translation describes a combination of horizontal and vertical movements as a single movement. A reflection describes movement across a reflection line. A rotation describes an amount of movement around a turn centre along a circular path in either a clockwise or counter-clockwise direction.	Location can change as a result of movement in space. Change in location does not imply change in orientation.	Create an image of a polygon in the Cartesian plane by translating the polygon. Describe the horizontal and vertical components of a given translation. Create an image of a polygon in the Cartesian plane by reflecting the polygon over the *x*-axis or *y*-axis. Describe the line of reflection of a given reflection. Create an image of a polygon in the Cartesian plane by rotating the polygon 90°, 180°, or 270° about one of its vertices, clockwise or counter-clockwise. Describe the angle and direction of a given rotation. Relate the coordinates of a polygon and its image after translation, reflection, or rotation in the Cartesian plane.

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Organizing Idea	Measurement: Attributes such as length, area, volume, and angle are quantified by measurement.					
Guiding Question	In what ways can we communicate area?			In what ways can we relate shapes using conservation of area?		
Learning Outcome	Students explain area using standard units.			Students analyze area of parallelograms and triangles.		
	Knowledge	Understanding	Skills & Procedures	Knowledge	Understanding	Skills & Procedures
	Area is expressed in the following standard units, derived from standard units of length: • square centimetres • square metres • square kilometres A square centimetre (cm^2) is an area equivalent to the area of a square measuring 1 centimetre by 1 centimetre. A square metre (m^2) is an area equivalent to the area of a square measuring 1 metre by 1 metre. A square kilometre (km^2) is an area equivalent to the area of a square measuring 1 kilometre by 1 kilometre. Among all rectangles with the same area, the square has the least perimeter.	Area can be expressed in various units according to context and desired precision. Rectangles with the same area can have different perimeters.	Relate a centimetre to a square centimetre. Relate a metre to a square metre. Relate a square centimetre to a square metre. Express the relationship between square centimetres, square metres, and square kilometres. Justify the choice of square centimetres, square metres, or square kilometres as appropriate units to express various areas. Estimate an area by comparing to a benchmark of a square centimetre or square metre. Express the area of a rectangle using standard units given the lengths of its sides. Compare the perimeters of various rectangles with the same area. Describe the rectangle with the least perimeter for a given area. Solve problems involving perimeter and	Any side of a parallelogram can be interpreted as the base. The height of a parallelogram is the perpendicular distance from its base to its opposite side. The area of a triangle is half of the area of a parallelogram with the same base and height. Two triangles with the same base and height must have the same area.	The area of a parallelogram can be generalized as the product of the perpendicular base and height. The area of a triangle can be interpreted relative to the area of a parallelogram.	Rearrange the area of a parallelogram to form a rectangular area using hands-on materials or digital applications. Determine the area of a parallelogram using multiplication. Determine the base or height of a parallelogram using division. Model the area of a parallelogram as two congruent triangles. Describe the relationship between the area of a triangle and the area of a parallelogram with the same base and height. Determine the area of a triangle, including various triangles with the same base and height. Solve problems involving area of parallelograms and triangles.

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			area of rectangles.			
				Area of composite shapes can be interpreted as the sum of the areas of multiple shapes, such as triangles and parallelograms.	An area can be decomposed in infinitely many ways.	Visualize the decomposition of composite areas in various ways. Determine the area of composite shapes using the areas of triangles and parallelograms.

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Organizing Idea	Measurement: Attributes such as length, area, volume, and angle are quantified by measurement.					
Guiding Question				How can volume characterize space?		
Learning Outcome				Students interpret and express volume.		
				Knowledge	Understanding	Skills & Procedures
				Volume can be measured in non-standard units or standard units (e.g., cubic centimetres). Volume is expressed in the following standard units, derived from standard units of length: • cubic centimetres • cubic metres A cubic centimetre (cm^3) is a volume equivalent to the volume of a cube measuring 1 centimetre by 1 centimetre by 1 centimetre. A cubic metre (m^3) is a volume equivalent to the volume of a cube measuring 1 metre by 1 metre by 1 metre. The volume of a right rectangular prism can be interpreted as the product of the two-dimensional base area and the perpendicular height of the prism.	Volume is a measurable attribute that describes the amount of three-dimensional space occupied by a three-dimensional object. The volume of a prism can be interpreted as the result of perpendicular motion of an area. Volume remains the same when decomposed or rearranged. Volume is quantified by measurement. Volume is measured with congruent units that themselves have volume and do not need to resemble the shape being measured. The volume of a right rectangular prism can be perceived as cube-shaped units structured in a three-dimensional array.	Recognize volume in familiar contexts. Model volume of prisms by dragging or iterating an area using hands-on materials or digital applications. Create a model of a three-dimensional object by stacking congruent non-standard units or cubic centimetres without gaps or overlaps. Express volume in non-standard units or cubic centimetres. Visualize and model the volume of various right rectangular prisms as three-dimensional arrays of cube-shaped units. Determine the volume of a right rectangular prism using multiplication. Solve problems involving volume of right rectangular prisms.

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Organizing Idea	Patterns: Awareness of patterns supports problem solving in various situations.					
Guiding Question	How might representation of a sequence provide insight into change?			How can a function enhance our interpretation of change?		
Learning Outcome	Students relate position and terms of an arithmetic sequence.			Students acquire an understanding of functions.		
	Knowledge	Understanding	Skills & Procedures	Knowledge	Understanding	Skills & Procedures
	A table of values representing an arithmetic sequence lists the position in the first column or row and the corresponding term in the second column or row. Points representing an arithmetic sequence on a coordinate grid fit on a straight line. An algebraic expression can describe the relationship between the positions and terms of an arithmetic sequence.	Each term of an arithmetic sequence corresponds to a natural number indicating position in the sequence.	Represent one-to-one correspondence between positions and terms of an arithmetic sequence in a table of values and on a coordinate grid. Describe the graph of an arithmetic sequence as a straight line. Describe a rule, limited to one operation, that expresses correspondence between positions and terms of an arithmetic sequence. Write an algebraic expression, limited to one operation, that represents correspondence between positions and terms of an arithmetic sequence. Determine the missing term in an arithmetic sequence that corresponds to a given position. Solve problems involving an arithmetic sequence.	A variable can be interpreted as the values of a changing quantity. A function can involve quantities that change over time, including • height or weight of a person • height of a plant • temperature • distance travelled A table of values lists the values of the independent variable in the first column or row and the values of the dependent variable in the second column or row to represent a function at certain points. The values of the independent variable are represented by x-coordinates in the Cartesian plane. The values of the dependent variable are represented by y-coordinates in the Cartesian plane.	A function is a correspondence between two changing quantities represented by independent and dependent variables. Each value of the independent variable in a function corresponds to exactly one value of the dependent variable.	Identify the dependent and independent variables in a given situation, including situations involving change over time. Describe the rule that determines the values of the dependent variable from values of the independent variable. Create a table of values representing corresponding values of the independent and dependent variables of a function at certain points. Represent corresponding values of the independent and dependent variables of a function as points in the Cartesian plane. Write an algebraic expression that represents a function. Recognize various representations of the same function. Determine a value of the dependent variable of a function given the corresponding value of the independent variable. Investigate

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					strategies for determining a value of the independent variable of a function given the corresponding value of the dependent variable. Solve problems involving a function.

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Organizing Idea	Statistics: The science of collecting, analyzing, visualizing, and interpreting data can inform understanding and decision making.					
Guiding Question	How might frequency bring meaning to data?			How can frequency support communication?		
Learning Outcome	Students analyze frequency in categorized data.			Students apply and explain relative frequency with experimental data.		
	Knowledge	Understanding	Skills & Procedures	Knowledge	Understanding	Skills & Procedures
	Frequency can be compared across categories to answer statistical questions. The mode is the category with the highest frequency.	Frequency is a count of categorized data, but it is not the data value itself.	Examine categorized data in tables and graphs. Determine frequency for each category of a set of data by counting individual data points. Identify the mode in various representations of data. Recognize data sets with no mode, one mode, or multiple modes. Justify possible answers to a statistical question using mode.	Relative frequency can be used to compare the same category of data across multiple data sets. Relative frequency can be represented in various forms.	Relative frequency expresses the frequency of a category of data as a fraction of the total number of data values.	Interpret frequency of categorized data as relative frequency. Express relative frequencies as decimals, fractions, or percentages.
	Closed-list response survey questions provide a list of possible responses. Open-ended response survey questions allow any response. Survey responses can be categorized in various ways. Representations of frequency can include • bar graphs • dot plots • stem-and-leaf plots	Frequency can be a count of categorized responses to a question. Frequency can be used to summarize data. Frequency can be represented in various forms.	Discuss potential categories for open-ended response survey questions and closed-list response survey questions in relation to the same statistical question. Formulate closed-list response survey questions to collect data to answer a statistical question. Categorize data collected from a closed-list response survey. Organize counts of categorized data in a frequency table. Create various representations of data, including with technology, to interpret frequency.	Equally likely outcomes of an experiment have the same chance of occurring. An event can be described as a combination of potential outcomes of an experiment, including • heads or tails from a coin toss • any roll of a die • the result of spinning a spinner The law of large numbers states that more independent trials of an experiment result in a better estimate of the expected likelihood of an event.	Frequency can be a count of categorized observations or trials in an experiment. Relative frequency of outcomes can be used to estimate the likelihood of an event. Relative frequency varies between sets of collected data. Relative frequency provides a better estimate of the likelihood of an event with larger amounts of data.	Identify the possible outcomes of an experiment involving equally likely outcomes. Collect categorized data through experiments, including with coins, dice, and spinners. Predict the likelihood of an event based on the possible outcomes of an experiment. Determine relative frequency for categories of a sample of data. Describe the likelihood of an outcome in an experiment using relative frequency. Analyze relative frequency statistics from experiments with different sample sizes.