KEY CHANGES
Ontario Mathematics Curriculum, Grades 1 to 8, 2020

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Topic	2005 Curriculum	2020 Curriculum
Curriculum Context		
Introduction	- Introduction - The Importance of Mathematics - Principles Underlying the Ontario Mathematics Curriculum - Roles and Responsibilities in Mathematics Education - Students - Parents - Teachers - Principals - The Program in Mathematics - Curriculum Expectations - Strands in the Mathematics Curriculum - The Mathematical Processes	- Preface - Vision and Goals - The Importance and Beauty of Mathematics - Principles Underlying the Ontario Mathematics Curriculum - Roles and Responsibilities in Mathematics Education - Students - Parents - Teachers - Principals - Community Partners - The Program in Mathematics - Curriculum Expectations - Examples, Key Concepts, and Sample Tasks - The Mathematical Processes - The Strands in the Mathematics Curriculum, including: - Social-Emotional Learning Skills: Key Components and Sample Strategies - The Process of Mathematical Modelling
Topic	**2005 Curriculum**	**2020 Curriculum**
Some Considerations for Program Planning in Mathematics	- Teaching Approaches - Cross-Curricular and Integrated Learning - Planning Mathematics Programs for Exceptional Students - English As a Second Language and English Literacy Development (ESL/ELD)	- Instructional Approaches in Mathematics, including High-Impact Instructional Practices in Mathematics - The Role of Information and Communication Technology in Mathematics - Planning Mathematics Programs for Students with Special Education Needs

	● Antidiscrimination Education in Mathematics ● The Role of Technology in Mathematics	● Planning Mathematics Programs for English Language Learners ● Human Rights, Equity, and Inclusive Education in Mathematics

Cross-Curricular and Integrated Learning in Mathematics	● Some Considerations for Program Planning in Mathematics (Continued)
	  ○ Literacy and Inquiry/Research Skills
	  ○ Guidance and Mathematics
	  ○ Health and Safety in Mathematics
		● Literacy in Mathematics
		● Transferable Skills in Mathematics

Assessment and Evaluation of Student Achievement	● Basic Considerations ● The Achievement Chart for Mathematics	● The Achievement Chart for Mathematics Note: The revised elementary mathematics curriculum includes changes to the way that achievement in math will be reported on provincial report cards. Teachers will report one overall mark or grade for the subject of mathematics, along with comments that reflect learning across the strands.

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A. Social-Emotional Learning (SEL) Skills in Mathematics and the Mathematical Processes		
Social-Emotional Learning Skills and Mathematical Processes	● SEL skills were not included ● Mathematical process expectations outlined for each grade	● Applying SEL Skills and the mathematical processes is an explicit overall expectation in each grade
B. Number		
Numbers	● Gr. 1: Working with numbers up to 50 ● Gr. 2: Working with numbers to 100 ● Gr. 7-8: Working with integers ● Gr. 8: Working with exponents ● Gr. 8: Working with rational numbers	● Gr. 1: Working with numbers up to 50 ● Gr. 2: Working with numbers up to 200 ● Gr. 6-8: Working with integers ● Gr. 7: Working with exponents ● Gr. 8: Working with rational and irrational numbers, including scientific notation
Multiplication and Division Facts	● Gr. 3: multiply to 7×7, and related division facts ● Gr. 4: multiply to 10×10, and related division facts	● Gr. 3: recalling $\times 2$, $\times 5$, $\times 10$, and represent multiplication up to 10×10 using tools and drawings ● Gr. 4: recalling multiplication facts from 1×1 to 10×10, and related division facts ● Gr. 5: recalling multiplication facts from 0×0 to 12×12, and related division facts ● Gr. 6: divisibility rules for reinforcement of multiplication facts ● Gr. 8: recalling commonly used square numbers and square roots
Fractions	● Gr. 1: Begin to look at halves. ● Gr. 4: Writing fractions with standard fractional form, e.g., $\frac{1}{2}$ ● Gr. 7: Add and subtract fractions with like and unlike denominators ● Gr. 8: Represent multiplying and dividing fractions	● Gr. 1: Begin to recognize equivalent fractions ● Gr. 3: Writing fractions with standard fractional notation, e.g., $\frac{1}{2}$ ● Gr. 4: Begin to work with equivalent fractions ● Gr. 5: Add and subtract fractions with like denominators, and multiplying and dividing one-digit whole numbers by unit fractions ● Gr. 6: Add and subtract fractions with like and unlike denominators, and multiplying and dividing whole

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		• numbers by proper fractions • Gr. 7: Multiplying and dividing fractions by fractions using tools, applying equivalent fractions, and generating fractions and decimals between any two quantities • Gr. 8: Multiplying and dividing fractions and integers
Decimals and Percent	• Gr. 4: Working with decimal tenths • Gr. 5: Working with decimal hundredths, including equivalent representations of decimal numbers • Gr. 6: Working with decimal thousandths, conversions between fractions and decimals, estimating the sum and difference of whole numbers and decimals, and multiplying and dividing decimal numbers by 10, 100, 1 000, and 10 000 using mental math strategies, and multiplying and dividing decimal numbers to tenths by whole numbers • Gr: 7: Divide whole numbers by decimals to hundredths, using concrete materials, and multiplying and dividing decimal numbers to thousandths by one-digit whole numbers • Gr. 8: Working with percents expressed to one decimal place and whole-number percents greater than 100, and multiplying and dividing decimal numbers by powers of ten	• Gr. 4: Working with decimal tenths, including conversions between fractions and decimal numbers, and using mental math strategies to add and subtract decimal tenths • Gr. 5: Working with decimal hundredths, including conversions between fractions, decimal numbers and percent, and using mental math strategies to multiply whole numbers by 0.1 and 0.01 and estimate sums and differences of decimal numbers up to hundredths • Gr. 6: Working with decimal thousandths, including conversions between fractions, decimal numbers and percent, using mental math to calculate percents of whole numbers, multiplication and division of three-digit whole numbers by decimal tenths, and dividing decimal numbers up to thousandths by whole numbers up to 10 • Gr. 7: Recalling commonly used percents, decimals, and fractions equivalents, using mental math to increase or decrease a whole number by 1%, 5%, 10%, 25%, 50%, and 100%, and dividing decimal numbers by decimal numbers • Gr. 8: Using mental math strategies to multiply and divide whole numbers and decimal numbers up to thousandths by powers of ten
C. Algebra		
Number Properties	• Gr. 2: Commutative property of addition, property of zeros for addition and subtraction	• Gr. 1-8: Explicit references to number properties as part of the Number strand

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	• Gr. 3: Associative property of addition, properties of 0 and 1 for multiplication, inverse relationship of addition and subtraction • Gr. 4: Commutative property of multiplication, distributive property	

Patterns	• Working with specific types of patterns in different grades, including:
	  ○ Gr. 1: Repeating patterns,
	  ○ Gr. 2: Repeating, growing, and shrinking patterns
	  ○ Gr. 3: Numeric and geometric patterns
	  ○ Gr. 4: Numeric and geometric patterns, and repeating patterns involving reflections
	  ○ Gr. 5: Growing and shrinking patterns, and repeating patterns involving translations
	  ○ Gr. 6: Growing and shrinking patterns, and repeating patterns involving rotations
	  ○ Gr. 7-8: Linear growing patterns
		• Gr. 1-8: Working with a variety of patterns in each grade, including:
		  ○ Gr. 1-3: A variety of patterns
		  ○ Gr. 4: Repeating and growing patterns
		  ○ Gr. 5: Repeating, growing, and shrinking patterns
		  ○ Gr. 6-7: Repeating, growing, and shrinking patterns, including linear growing patterns
		  ○ Gr. 8: Repeating, growing, and shrinking patterns, and linear growing and shrinking patterns

Equations and Inequalities	• Gr. 5: Introducing variables in equations • No expectations on solving inequalities	• Gr. 1-8: Working with variables • Gr. 4-8: Solving inequalities
Algebraic Expressions	• Gr. 7-8: Evaluating expressions • No expectations on simplifying algebraic expressions	• Gr. 5-8: Evaluating expressions • Gr. 6: Adding monomials with a degree of 1 • Gr. 7: Adding and subtracting monomials with a degree of 1 • Gr. 8: Adding and subtracting monomials with a degree of 1, and adding binomials with a degree of 1

Coding	• No references to coding	• Focus on coding throughout all grades, including:
		  ○ Gr. 1: Sequential events
		  ○ Gr. 2: Sequential and concurrent events
		  ○ Gr. 3: Sequential, concurrent, and repeating events

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		○ Gr. 4: Sequential, concurrent, repeating, and nested events ○ Gr. 5-6: Code involving conditional statements and other control structures ○ Gr. 7: Code involving events influenced by subprograms and other control structures ○ Gr. 8: Code involving the analysis of data
Mathematical Modelling Process	● No references to the mathematical modelling process	● Gr. 1-8: Focus on the application of the mathematical modelling process
D. Data		
Collection and Organization	● Gr. 1-8: Working with categorical and numerical data	● Gr. 1-8: Working with qualitative and quantitative data ● Gr. 1-8: Formulating questions that can be answered by collecting, organizing, displaying, and analyzing data ● Gr. 2-3: Using Carroll diagrams
Graphical Representations	● Gr. 1: Prepared templates of concrete and pictographs ● Gr. 4: Double bar graphs ● Gr. 5: Broken-line graphs ● Gr. 6: Continuous line graphs ● Gr. 8: Histograms	● Gr. 1: Concrete and pictographs ● Gr. 4: Multiple bar graphs ● Gr. 5: Stacked bar graphs ● Gr. 6: Broken-line graphs, histograms ● Gr. 8: Scatter plots
Analysis of Data	● Gr. 3: Mode ● Gr. 4: Median ● Gr. 5: Mean	● Gr. 2: Mode ● Gr. 3: Mean ● Gr. 4: Median ● Gr. 6: Range ● Gr. 8: Description of relationship between two-variables
Infographics	● Infographics were not included	● Gr. 4-8: Reading and creating Infographics

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Probability	- Gr. 1-2: Likelihood of events - Gr. 3-5: Simple experimental probability - Gr. 6: Simple experimental and theoretical probability - Gr. 7: Experimental and theoretical probability of two independent events - Gr. 8: Experimental and theoretical probability of complementary events	- Gr. 1-4: Likelihood of events including getting the same mode, mean, and median from another population of the same size - Gr. 5: Experimental and theoretical probability of an event (including complementary) - Gr. 6: Experimental and theoretical probability of two independent events (including complementary) - Gr. 7: Experimental and theoretical probability of two independent events and two dependent events (including complementary) - Gr. 8: Experimental and theoretical probability of multiple independent events and multiple dependent events (including complementary)
E. Spatial Sense		
Geometric Reasoning	- Gr. 2: Sorting and describing prisms, pyramids and polygons by geometric properties; - Gr. 3: Prisms and pyramids, polygons and quadrilaterals, congruent 2D shapes; - Gr. 4: Prisms and pyramids, quadrilaterals, constructing 3D figures from a picture - Gr. 5: Triangles, nets of 3D figures, and identifying prisms and pyramids from nets - Gr. 6: Properties of quadrilaterals and polygons, constructing (congruent) polygons; - Gr. 7: Related lines and bisectors, triangles and quadrilaterals, prisms, and area, perimeter, and angles of congruent shapes - Gr. 8: Quadrilaterals, circles	- Gr. 2: Focus on 2D shapes and congruence - Gr. 3: Focus on 3D objects and congruence - Gr. 4: Properties of rectangles, inclusive of squares - Gr. 5: Properties of triangles, constructing congruent triangles, rectangles and parallelograms, and drawing top, front, side views - Gr. 6: Properties of quadrilaterals, nets of prisms and pyramids, and nested relationships between quadrilaterals; - Gr. 7: Cylinders, prisms, pyramids, circles, drawing scale drawings of objects and spaces, and similarity - Gr. 8: Tessellations and using scale drawings
Location and Movement	- Gr. 3: Identify reflections, translations and rotations; line symmetry in pictures - Gr. 4: Reflections - Gr. 5: Cardinal directions, coordinate system - Gr. 6: First quadrant of Cartesian plane, rotations of 180° clockwise and 90° counterclockwise	- Gr. 3: Multi-step instructions with half- and quarter-turns (coding links) - Gr. 4: Plotting points on first quadrant of Cartesian plane; translations and reflections - Gr. 5: Cartesian plane with various scales, rotations up to 180°

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	• Gr. 7: Tessellations, plotting points on four quadrants of Cartesian plane • Gr. 8: Translations, reflections, rotations of 90°, 180°, or 270° on Cartesian plane	• Gr. 6: Four quadrants of Cartesian plane, combinations of transformations, rotations to 360° • Gr. 7: Translations, reflections and rotations on Cartesian plane • Gr. 8: Transformations on Cartesian plane
Identifying and comparing attributes	• Not explicit in Gr. 1	• Focus in Gr. 1

Length	• Focus in Gr. 1-4
	• Length, height, and distance described discreetly
	   ○ Gr. 1: non-standard units
	   ○ Gr. 2: cm, m
	   ○ Gr. 3: cm, m, km
	   ○ Gr. 4: cm, m, km, mm
	   ○ Gr. 5-8: applied
		• Focus in Gr. 2-3
		• Unifies width, height, and distance under length
		   ○ Gr. 2: non-standard, cm, m
		   ○ Gr. 3: mm, km
		   ○ Gr. 4-8: applied

Perimeter	• Treated separate from length; often linked to area • Focus in Gr. 3-5 • Gr. 6-8: applied as distinct attribute	• Treated as an application of length • Focus in Gr. 3 • Gr. 4-8: applied as a length

Area	• Area focus every year:
	   ○ Gr. 1: non-standard units
	   ○ Gr. 2: non-standard units
	   ○ Gr. 3: arrays with square units
	   ○ Gr. 4: arrays with square units
	   ○ Gr. 5: arrays with square units; area of rectangle
	   ○ Gr. 6: square centimetres; area of parallelogram and triangle
	   ○ Gr. 7: trapezoids
	   ○ Gr. 8: area of a circle
		• Focus in Gr. 3-8:
		   ○ Gr. 3: non-standard and standard units
		   ○ Gr. 4: arrays and area of rectangle
		   ○ Gr. 5: area of parallelogram and triangle
		   ○ Gr. 6: area of quadrilaterals, including trapezoids; surface area of prisms
		   ○ Gr. 7: area of a circles; surface area of cylinder
		   ○ Gr. 8: area of complex shapes

Time	• Gr. 1: Telling time to the hour or half-hour • Gr. 2: Telling time to the quarter-hour • Gr. 3: Telling time to nearest 5 minutes • Gr. 4: Telling time to nearest minute	• Gr. 1: Telling and marking time with a calendar • Gr. 2: Measuring the passing of time (standard and non-standard units) • Gr. 3: Telling time on a clock; unified focus on

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	● Gr. 5: Telling time to nearest second	understanding the hour/min scales

Capacity	● Capacity and mass grouped together
	● Capacity and mass:
	  ○ Gr. 2: Non-standard units
	  ○ Gr. 3: Standard metric units (L, partial L)
	  ○ Gr. 4: Standard metric units (L, mL)
	  ○ Gr. 5: Capacity and volume units (mL, cm^2)
	  ○ Gr. 6: Capacity and volume units (mL, cm^2)
	  ○ Gr. 7: Capacity and volume conversion
		● Mass and capacity treated as different attributes with different measurement tools and units
		● Capacity:
		  ○ Gr. 3: Non-standard units
		  ○ Gr. 4: Standard metric units (mL, L)
		  ○ Gr. 5-8: Applied in different contexts
		  ○ Gr. 7: Relationship to volume units; conversion

Volume	● Discrete formulas for each prism and cylinder
	● Volume: focus in Gr. 4-9
	  ○ Gr. 4: Count of cubes
	  ○ Gr. 5: Standard units; volume of rectangular prism (discrete)
	  ○ Gr. 6: Volume of triangular prism (discrete)
	  ○ Gr. 7: Volume of right prisms (discrete)
	  ○ Gr. 8: volume of cylinders (discrete)
		● Unified formula for all prisms and cylinders (Area of base x height)
		● Volume: Focus in Gr. 7-8
		  ○ Gr. 7: Relationship to capacity; standard units; formula for all prisms and cylinders
		  ○ Gr. 8: Applied

Mass	● Mass and capacity grouped together
	● Mass and capacity:
	  ○ Gr. 2: Non-standard units
	  ○ Gr. 3: Standard metric units (kg)
	  ○ Gr. 4: Standard metric units (g)
	  ○ Gr. 5: Standard metric units (mg)
		● Mass and capacity treated as different attributes with different measurement tools and units
		● Mass and capacity:
		  ○ Gr. 3: Non-standard units and scales
		  ○ Gr. 4: Standard metric units and scales (kg, g)
		  ○ Gr. 5-8: Applied

Angle	● Only in Geometry, not in Measurement
	  ○ Gr. 3: Comparing angles; right angles
	  ○ Gr. 4: Right angles
	  ○ Gr. 5: Angles to 90°; protractors
	  ○ Gr. 6: Angles to 180°
	  ○ Gr. 7-8: Angle properties
		● Integrated across overall expectation 1 (Geometry) and 2 (Measurement)
		  ○ Gr. 4: Right, straight, acute angles
		  ○ Gr. 5: Angles to 180°; protractors
		  ○ Gr. 6: Angles to 360°
		  ○ Gr. 6 and 8: Angle properties

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Circle	● Focus in Gr. 8	● Focus in Gr. 7
Pythagorean Theorem	● Gr. 8: Pythagorean Relationship ● Gr. 9: Pythagorean Theorem	● Gr. 8: Pythagorean Relationship and Theorem
F. Financial Literacy		
Money Concepts	● Gr. 1: Identify and recognize coins ● Gr. 2: Represent money amounts to 100¢ ● Gr. 3: Add and subtract money amounts to $10 for simulated purchases ● Gr. 4: Add and subtract money amounts to $100 for simulated purchases	● Gr. 1: Identify and recognize coins up to 50¢ and coins and bills up to $50 ● Gr. 2: Represent money amounts to 200¢ or $200 ● Gr. 3: Estimate and calculate change for simple cash transactions of whole dollar amounts or amounts less than one dollar ● Gr. 4: Estimate and calculate change for cash transactions involving more than one item, whole dollar amounts or amounts less than one dollar ● Gr. 5-6: Identify and describe various payment methods and ways to transfer money ● Gr. 7-8: identify and compare exchange rates
Financial Management	● No expectations related to financial management	● Gr. 4-8: Financial management (e.g., earning, spending, saving, donating, investing, credit, debt; setting financial goals and making a basic budget, etc.)
Consumer and Civic Awareness	● No expectations related to consumer and civic awareness	● Gr. 4-8: Consumer and civic awareness (e.g., best buys, interest rates, taxes, loyalty programs, etc.)