Ontario Mathematics Curriculum Overview: Gr. 6 ~ 9

Grades	Key Concepts & Skills	Overview
A. Social-Emotional Learning Skills & Mathematical Process		
6	**[Social-Emotional Learning Skills]** • identify and manage emotions • recognize sources of stress and cope with challenges • maintain positive motivation and perseverance • build relationships and communicate effectively • develop self-awareness and sense of identity • think critically and creatively **[Mathematical Processes]** • problem solving • communicating • reasoning and proving • representing • reflecting • connecting • selecting tools and strategies	Students will: - continue to deepen their sense of self - track different aspects that impact their physical and mental health eg. The number of steps they take each day, minutes of screen time, how they feel after physical activity - use graphs and data visualization tools to provide information for reflection and learning
7		Students will: - learn how to cope with stress and manage complex challenges - learn to break down a task into smaller portions, make a plan, and take it one step at a time
8		Students will: - continue to build healthy relationship skills - use data in an infographic to communication and tell a story and build awareness about others

B. Number

6	**[Number Sense]** • rational numbers • fractions, decimals, and percents **[Operations]** • properties and relationships • math facts • mental math • addition and subtraction • multiplication and division	Students will: - work with numbers up to 1 million - be introduced to integers - learn the divisibility rules of 2, 3, 4, 5, 6, 8, 9, and 10 - expand operational skills including dividing a whole number by a fraction or a mixed number - solve problems that involve multiple operations with whole numbers, decimals, and fraction
7	**[Number Sense]** • rational numbers • fractions, decimals, and percents **[Operations]** • properties and relationships • math facts • mental math • addition and subtraction • multiplication and division	Students will: - work with numbers up to 1 billion - be introduced to rational numbers (eg. perfect squares and square roots) - be expected to know multiplication facts from 0 x 0 to 12 x 12 - begin to generate factors (eg. factors of 6 are 1 and 6, 2 and 3), multiples (eg. multiples of 6 are 6, 12, 24…) - add and subtract fractions by creating equivalent fractions - explore problems that require addition and subtraction of integers (eg. overall score or change in temperature)
8	**[Number Sense]** • rational and irrational numbers **[Operations]** • properties and relationships • math facts • mental math • addition and subtraction • multiplication and division	Students will: - use scientific notations to understand, represent, and compare very large and small numbers - use fractions, decimals and per cents interchangeably - recall square numbers to 144 and their square roots - solve problems that involve proportions and whole numbers, fractions, decimals, integers and exponents

C. Algebra

6	**[Patterns and Relations]** • patterns **[Equations and Inequalities]** • variables and expressions • equalities and inequalities **[Coding]** • coding skills **[Mathematical Modelling]**	Students will: - work with patterns and identify patterns that grow at a constant rate eg. If someone drives 100 km per hour, the distance travelled increases by 100 km for each hour - solve algebraic expressions involving whole numbers and decimal tenths, and algebraic equations involving multiple terms (eg. 2x + 3x = 5x) - use code to solve problems that involve optimization (eg. fining the maximum area for a given perimeter) - use the process of mathematical modelling to solve problems from real-life (eg. finding several different ways to maximize the play area in a playground design and calculating the costs of each)

7	**[Patterns and Relations]** • patterns **[Equations and Inequalities]** • variables and expressions • equalities and inequalities	Students will: - connect their understanding of whole-number patterns to patterns involving decimals - solve equations that involve multiple terms, whole numbers, and decimal numbers (eg. 2x + 5 = 3x – 1) - write code to simulate a probability experiment and determine the different results in a game - use mathematical modelling to provide insight into real-life situations (eg. determining the best options for raising funds for a local charity)
8	**[Coding]** • coding skills **[Mathematical Modelling]**	Students will: - develop their understanding of patterns, including those that involve integers - use algebraic notation – such as *s = d/t* – to represent the relationship between speed, distance and time - solve algebraic equations involving multiple terms, integers and decimal numbers - write code to create a line or curve that falls between the greatest number of data points - use modelling for real-life situations
D. Data		
6	**[Data Literacy]** • data collection and organization • data visualization • data analysis **[Probability]**	Students will: - learn to distinguish between discrete data and continuous data - choose how to display different types of data, including broken-line graphs - learn different ways to describe probability eg. There is a one in four chance of winning a prize at the school fun fair. eg. There is a 40% chance of rain tomorrow.
7		Students will: - learn how to use circle graphs to represent data - develop a critical eye for analyzing data by examining graphs that may be misleading - determine the differences between the probability of independent events vs. dependent events eg. How does the probability differ if 2 marbles are drawn from a bag with or without replacement.
8		Students will: - continue to build their data skills - analyze data that is presented in more complex ways – such as in scatter plots – that show the relationship between two variables - continue to increase their understanding of probability by comparing the outcomes of more complex experiments
E. Spatial Sense		
6	**[Geometric and Spatial Reasoning]** • geometric reasoning • location and movement **[Measurement]** • the metric system • angles • area and surface area	Students will: - continue to develop spatial sense with an emphasis on four-sided shapes - learn the characteristics and properties of different kinds of four-sided shapes and find their areas - build 3D structures and learn to calculate surface area - learn to convert from one unit to another in the metric system - focus on extending their ability to measure angles

7	**[Geometric and Spatial Reasoning]** • geometric reasoning • location and movement **[Measurement]** • circles • volume and surface area	Students will: - continue to develop spatial sense as they study the circle - learn to measure various aspects of circles – such as circumference, diameter, radius and area - use aspects of circles and other measurements to find the surface area and volume of cylinders and other 3D objects - learn how to dilate – enlarge and shrink – a shape
8	**[Geometric and Spatial Reasoning]** • geometric reasoning • location and movement **[Measurement]** • lines and angles • length, area, and volume	Students will: - continue to develop spatial sense as they student right-angle triangles - learn that if two side lengths are known, then the length of the third can be figured out without measuring it, using the Pythagorean Theory - learn how to calculate unknown angles by applying the angle properties of intersecting and parallel lines - build their understanding of very large units such as a terabyte and very small units like a nanosecond that are used in current technologies
F. Financial Literacy		
6		Students will: - learn the advantages and disadvantages of using different methods of payment for goods and services are explored - investigate different types of financial goals, identify and describe factors that could affect these goals, and outline steps to achieve them - explain the concept of interest rates and identify interest rates and fees offered by banks and other financial institutions - learn how trading, lending, borrowing and donating are different ways to distribute resources
7	**[Money]** • money concepts **[Finances]** • financial management • consumer and civic awareness	Students will: - being to learn that international currencies have different values compared to Canadian dollars and understand how exchange rates work - develop an awareness of how to plan for and reach financial goals - build their knowledge of how interest rates can affect savings and investments - learn about the cost of borrowing and compare interest rates and fees for different types of accounts and loans to become more informed consumers
8		Students will: - learn to create a plan to reach financial goals and identify ways to maintain balanced budgets - compare different ways that consumers can get value for their money when spending, such as using reward programs or taking advantage of sales - investigate the concepts of simple and compound interest using technology (eg. a spreadsheet program) and explain how interest affects long-term financial planning

Ontario Ministry of Education. (n.d.). New math curriculum for Grades 1 – 8. https://www.ontario.ca/page/new-math-curriculum-grades-1-8

Grade	Key Concepts & Skills	Overview
AA. Social-Emotional Learning Skills in Mathematics		
9	• Social-emotional learning skills	Students will: • build their social-emotional learning skills, such as learning to recognize and identify emotions that support mathematical learning • building their confidence and develop a healthy relationship with math
A. Mathematical Thinking and Making Connections		
9	• mathematical processes • making connections	Students will: - use their problem-solving, communication and reasoning skills as they develop their mathematical knowledge - make connections between what they learn in math and their real-life experiences
B. Number		
9	• development and use of numbers • number sets • powers • rational numbers • applications	Students will: - work with different types of numbers, such as powers with positive and negative exponents - solve problems involving positive and negative fractions, decimal numbers, and integers - build their knowledge and skills related to percentages, ratios, rates and proportions, and make connections to real-life situations (eg. comparing costs)
C. Algebra		
9	• development and use of algebra • algebraic expressions and equations • coding • linear and non-linear relations	Students will: - develop their understanding of algebraic expressions and equations - apply coding skills to understand complex math concepts and make predictions - learn about various linear and non-linear relations - increase their understanding of rates of change and apply it to make sense of real-life situations (eg. analysing motion of a car or rates of pollution)
D. Data		
9	• application of data • representation and analysis of data • application of mathematical modelling • process of mathematical modelling	Students will: - build their data literacy skills to examine the collection, representation, and use of data including how data is used to inform decisions - continue to apply mathematical modelling to analyse real-life situations, such as the impact of social media on the economy

E. Geometry & Measurement		
9	• geometric and measurement relationships	Students will: - make connections between geometric shapes and their applications in architecture, engineering, and design - analyse and create designs to increase understanding of geometric relationships - solve real-life problems that involve applying their knowledge of perimeter, area, surface area, and volume, such as planning and creating models of a community garden
F. Financial Literacy		
9	• financial decisions	Students will: - building their financial literacy by learning to manage finances, such as working with budgets and understanding appreciation and depreciation of assets - analyse various financial situations and learn how math can be applied to make informed decisions (eg. understanding shifts in the stock market) - examine how interest rates, down payments, and other factors impact purchasing decisions

Ontario Ministry of Education. (n.d.). Grade 9 math: a guide for parents. https://www.dcp.edu.gov.on.ca/en/grade-9-math-guide/what-students-will-learn