

B. NUMBER

By the end of each grade, students will:

Ontario Mathematics Curriculum Expectations, Grades 1 to 8, 2020

OVERALL EXPECTATION B1. demonstrate an understanding of numbers and make connections to the way numbers are used in everyday life							
SPECIFIC EXPECTATIONS							
Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8
Whole Numbers					Rational Numbers		Rational and Irrational Numbers
B1.1 read and represent whole numbers up to and including 50, and describe various ways they are used in everyday life							
B1.2 compose and decompose whole numbers up to and including 50, using a variety of tools and strategies, in various contexts	B1.1 read, represent, compose, and decompose whole numbers up to and including 200, using a variety of tools and strategies, and describe various ways they are used in everyday life	B1.1 read, represent, compose, and decompose whole numbers up to and including 1000, using a variety of tools and strategies, and describe various ways they are used in everyday life	B1.1 read, represent, compose, and decompose whole numbers up to and including 10 000, using appropriate tools and strategies, and describe various ways they are used in everyday life	B1.1 read, represent, compose, and decompose whole numbers up to and including 100 000, using appropriate tools and strategies, and describe various ways they are used in everyday life	B1.1 read and represent whole numbers up to and including one million, using appropriate tools and strategies, and describe various ways they are used in everyday life	B1.1 represent and compare whole numbers up to and including one billion, including in expanded form using powers of ten, and describe various ways they are used in everyday life	B1.1 represent and compare very large and very small numbers, including through the use of scientific notation, and describe various ways they are used in everyday life
B1.3 compare and order whole numbers up to and including 50, in various contexts	B1.2 compare and order whole numbers up to and including 200, in various contexts	B1.2 compare and order whole numbers up to and including 1000, in various contexts	B1.2 compare and order whole numbers up to and including 10 000, in various contexts	B1.2 compare and order whole numbers up to and including 100 000, in various contexts	B1.2 read and represent integers, using a variety of tools and strategies, including horizontal and vertical number lines	B1.2 identify and represent perfect squares, and determine their square roots, in various contexts	

OVERALL EXPECTATION B1. demonstrate an understanding of numbers and make connections to the way numbers are used in everyday life

SPECIFIC EXPECTATIONS

Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8
Whole Numbers					Rational Numbers		Rational and Irrational Numbers
B1.4 estimate the number of objects in collections of up to 50, and verify their estimates by counting	B1.3 estimate the number of objects in collections of up to 200 and verify their estimates by counting	B1.3 round whole numbers to the nearest ten or hundred, in various contexts	B1.3 round whole numbers to the nearest ten, hundred, or thousand, in various contexts		B1.3 compare and order integers, decimal numbers, and fractions, separately and in combination, in various contexts	B1.3 read, represent, compare, and order rational numbers, including positive and negative fractions and decimal numbers to thousandths, in various contexts	B1.2 describe, compare, and order numbers in the real number system (rational and irrational numbers), separately and in combination, in various contexts
B1.5 count to 50 by 1s, 2s, 5s, and 10s, using a variety of tools and strategies	B1.4 count to 200, including by 20s, 25s, and 50s, using a variety of tools and strategies	B1.4 count to 1000, including by 50s, 100s, and 200s, using a variety of tools and strategies					B1.3 estimate and calculate square roots, in various contexts
	B1.5 describe what makes a number even or odd	B1.5 use place value when describing and representing multi-digit numbers in a variety of ways, including with base ten materials					

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SPECIFIC EXPECTATIONS

Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8
Fractions			Fractions and Decimals	Fractions, Decimals, and Percents			
B1.6 use drawings to represent and solve fair-share problems that involve 2 and 4 sharers, respectively, and have remainders of 1 or 2	B1.6 use drawings to represent, solve, and compare the results of fair-share problems that involve sharing up to 10 items among 2, 3, 4, and 6 sharers, including problems that result in whole numbers, mixed numbers, and fractional amounts	B1.6 use drawings to represent, solve, and compare the results of fair-share problems that involve sharing up to 20 items among 2, 3, 4, 5, 6, 8, and 10 sharers, including problems that result in whole numbers, mixed numbers, and fractional amounts					
B1.7 recognize that one half and two fourths of the same whole are equal, in fair-sharing contexts	B1.7 recognize that one third and two sixths of the same whole are equal, in fair-sharing contexts	B1.7 represent and solve fair-share problems that focus on determining and using equivalent fractions, including problems that involve halves, fourths, and eighths; thirds and sixths; and fifths and tenths	B1.4 represent fractions from halves to tenths using drawings, tools, and standard fractional notation, and explain the meanings of the denominator and the numerator	B1.3 represent equivalent fractions from halves to twelfths, including improper fractions and mixed numbers, using appropriate tools, in various contexts		B1.4 use equivalent fractions to simplify fractions, when appropriate, in various contexts	
B1.8 use drawings to compare and order unit fractions representing the individual portions that result when a whole is shared by different numbers of sharers, up to a maximum of 10			B1.5 use drawings and models to represent, compare, and order fractions representing the individual portions that result from two different fair-share scenarios involving any combination of 2, 3, 4, 5, 6, 8, and 10 sharers	B1.4 compare and order fractions from halves to twelfths, including improper fractions and mixed numbers, in various contexts		B1.5 generate fractions and decimal numbers between any two quantities	

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SPECIFIC EXPECTATIONS

Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8
			Fractions and Decimals	Fractions, Decimals, and Percents			
			B1.6 count to 10 by halves, thirds, fourths, fifths, sixths, eighths, and tenths, with and without the use of tools				
			B1.7 read, represent, compare, and order decimal tenths, in various contexts	B1.5 read, represent, compare, and order decimal numbers up to hundredths, in various contexts	B1.4 read, represent, compare, and order decimal numbers up to thousandths, in various contexts		
			B1.8 round decimal numbers to the nearest whole number, in various contexts	B1.6 round decimal numbers to the nearest tenth, in various contexts	B1.5 round decimal numbers, both terminating and repeating, to the nearest tenth, hundredth, or whole number, as applicable, in various contexts	B1.6 round decimal numbers to the nearest tenth, hundredth, or whole number, as applicable, in various contexts	
			B1.9 describe relationships and show equivalences among fractions and decimal tenths, in various contexts	B1.7 describe relationships and show equivalences among fractions, decimal numbers up to hundredths, and whole number percents, using appropriate tools and drawings, in various contexts	B1.6 describe relationships and show equivalences among fractions and decimal numbers up to thousandths, using appropriate tools and drawings, in various contexts	B1.7 convert between fractions, decimal numbers, and percents, in various contexts	B1.4 use fractions, decimal numbers, and percents, including percents of more than 100% or less than 1%, interchangeably and flexibly to solve a variety of problems

OVERALL EXPECTATION B2. use knowledge of numbers and operations to solve mathematical problems encountered in everyday life

SPECIFIC EXPECTATIONS

Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8
Properties and Relationships							
B2.1 use the properties of addition and subtraction, and the relationship between addition and subtraction, to solve problems and check calculations	B2.1 use the properties of addition and subtraction, and the relationships between addition and multiplication and between subtraction and division, to solve problems and check calculations	B2.1 use the properties of operations, and the relationships between multiplication and division, to solve problems and check calculations	B2.1 use the properties of operations, and the relationships between addition, subtraction, multiplication, and division, to solve problems involving whole numbers, including those requiring more than one operation, and check calculations	B2.1 use the properties of operations, and the relationships between operations, to solve problems involving whole numbers and decimal numbers, including those requiring more than one operation, and check calculations	B2.1 use the properties of operations, and the relationships between operations, to solve problems involving whole numbers, decimal numbers, fractions, ratios, rates, and whole number percents, including those requiring multiple steps or multiple operations	B2.1 use the properties and order of operations, and the relationships between operations, to solve problems involving whole numbers, decimal numbers, fractions, ratios, rates, and percents, including those requiring multiple steps or multiple operations	B2.1 use the properties and order of operations, and the relationships between operations, to solve problems involving rational numbers, ratios, rates, and percents, including those requiring multiple steps or multiple operations
Math Facts							
B2.2 recall and demonstrate addition facts for numbers up to 10, and related subtraction facts	B2.2 recall and demonstrate addition facts for numbers up to 20, and related subtraction facts	B2.2 recall and demonstrate multiplication facts of 2, 5, and 10, and related division facts	B2.2 recall and demonstrate multiplication facts for 1×1 to 10×10 , and related division facts	B2.2 recall and demonstrate multiplication facts from 0×0 to 12×12 , and related division facts	B2.2 understand the divisibility rules and use them to determine whether numbers are divisible by 2, 3, 4, 5, 6, 8, 9, and 10	B2.2 understand and recall commonly used percents, fractions, and decimal equivalents	B2.2 understand and recall commonly used square numbers and their square roots
Mental Math							
B2.3 use mental math strategies, including estimation, to add and subtract whole numbers that add up to no more than 20, and explain the strategies used	B2.3 use mental math strategies, including estimation, to add and subtract whole numbers that add up to no more than 50, and explain the strategies used	B2.3 use mental math strategies, including estimation, to add and subtract whole numbers that add up to no more than 1000, and explain the strategies used	B2.3 use mental math strategies to multiply whole numbers by 10, 100, and 1000, divide whole numbers by 10, and add and subtract decimal tenths, and explain the strategies used	B2.3 use mental math strategies to multiply whole numbers by 0.1 and 0.01 and estimate sums and differences of decimal numbers up to hundredths, and explain the strategies used	B2.3 use mental math strategies to calculate percents of whole numbers, including 1%, 5%, 10%, 15%, 25%, and 50%, and explain the strategies used	B2.3 use mental math strategies to increase and decrease a whole number by 1%, 5%, 10%, 25%, 50%, and 100%, and explain the strategies used	B2.3 use mental math strategies to multiply and divide whole numbers and decimal numbers up to thousandths by powers of ten, and explain the strategies used

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SPECIFIC EXPECTATIONS

Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8
Addition and Subtraction							
B2.4 use objects, diagrams, and equations to represent, describe, and solve situations involving addition and subtraction of whole numbers that add up to no more than 50	B2.4 use objects, diagrams, and equations to represent, describe, and solve situations involving addition and subtraction of whole numbers that add up to no more than 100	B2.4 demonstrate an understanding of algorithms for adding and subtracting whole numbers by making connections to and describing the way other tools and strategies are used to add and subtract	B2.4 represent and solve problems involving the addition and subtraction of whole numbers that add up to no more than 10 000 and of decimal tenths, using appropriate tools and strategies, including algorithms	B2.4 represent and solve problems involving the addition and subtraction of whole numbers that add up to no more than 100 000, and of decimal numbers up to hundredths, using appropriate tools, strategies, and algorithms	B2.4 represent and solve problems involving the addition and subtraction of whole numbers and decimal numbers, using estimation and algorithms	B2.4 use objects, diagrams, and equations to represent, describe, and solve situations involving addition and subtraction of integers	B2.4 add and subtract integers, using appropriate strategies, in various contexts
		B2.5 represent and solve problems involving the addition and subtraction of whole numbers that add up to no more than 1000, using various tools and algorithms		B2.5 add and subtract fractions with like denominators, in various contexts	B2.5 add and subtract fractions with like and unlike denominators, using appropriate tools, in various contexts	B2.5 add and subtract fractions, including by creating equivalent fractions, in various contexts	B2.5 add and subtract fractions, using appropriate strategies, in various contexts

OVERALL EXPECTATION B2. use knowledge of numbers and operations to solve mathematical problems encountered in everyday life

SPECIFIC EXPECTATIONS

Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8
Multiplication and Division							
		B2.6 represent multiplication of numbers up to 10×10 and division up to $100 \div 10$, using a variety of tools and drawings, including arrays			B2.6 represent composite numbers as a product of their prime factors, including through the use of factor trees	B2.6 determine the greatest common factor for a variety of whole numbers up to 144 and the lowest common multiple for two and three whole numbers	
B2.5 represent and solve equal-group problems where the total number of items is no more than 10, including problems in which each group is a half, using tools and drawings	B2.5 represent multiplication as repeated equal groups, including groups of one half and one fourth, and solve related problems, using various tools and drawings	B2.7 represent and solve problems involving multiplication and division, including problems that involve groups of one half, one fourth, and one third, using tools and drawings	B2.5 represent and solve problems involving the multiplication of two- or three-digit whole numbers by one-digit whole numbers and by 10, 100, and 1000, using appropriate tools, including arrays	B2.6 represent and solve problems involving the multiplication of two-digit whole numbers by two-digit whole numbers using the area model and using algorithms, and make connections between the two methods	B2.7 represent and solve problems involving the multiplication of three-digit whole numbers by decimal tenths, using algorithms	B2.7 evaluate and express repeated multiplication of whole numbers using exponential notation, in various contexts	
	B2.6 represent division of up to 12 items as the equal sharing of a quantity, and solve related problems, using various tools and drawings		B2.6 represent and solve problems involving the division of two- or three-digit whole numbers by one-digit whole numbers, expressing any remainder as a fraction when appropriate, using appropriate tools, including arrays	B2.7 represent and solve problems involving the division of three-digit whole numbers by two-digit whole numbers using the area model and using algorithms, and make connections between the two methods, while expressing any remainder appropriately	B2.8 represent and solve problems involving the division of three-digit whole numbers by decimal tenths, using appropriate tools, strategies, and algorithms, and expressing remainders as appropriate		

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SPECIFIC EXPECTATIONS

Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8
Multiplication and Division							
		B2.8 represent the connection between the numerator of a fraction and the repeated addition of the unit fraction with the same denominator using various tools and drawings, and standard fractional notation	B2.7 represent the relationship between the repeated addition of a unit fraction and the multiplication of that unit fraction by a whole number, using tools, drawings, and standard fractional notation	B2.8 multiply and divide one-digit whole numbers by unit fractions, using appropriate tools and drawings	B2.9 multiply whole numbers by proper fractions, using appropriate tools and strategies	B2.8 multiply and divide fractions by fractions, using tools in various contexts	B2.6 multiply and divide fractions by fractions, as well as by whole numbers and mixed numbers, in various contexts
					B2.10 divide whole numbers by proper fractions, using appropriate tools and strategies	B2.9 multiply and divide decimal numbers by decimal numbers, in various contexts	
					B2.11 represent and solve problems involving the division of decimal numbers up to thousandths by whole numbers up to 10, using appropriate tools and strategies		B2.7 multiply and divide integers, using appropriate strategies, in various contexts
		B2.9 use the ratios of 1 to 2, 1 to 5, and 1 to 10 to scale up numbers and to solve problems	B2.8 show simple multiplicative relationships involving whole-number rates, using various tools and drawings	B2.9 represent and create equivalent ratios and rates, using a variety of tools and models, in various contexts	B2.12 solve problems involving ratios, including percents and rates, using appropriate tools and strategies	B2.10 identify proportional and non-proportional situations and apply proportional reasoning to solve problems	B2.8 compare proportional situations and determine unknown values in proportional situations, and apply proportional reasoning to solve problems in various contexts