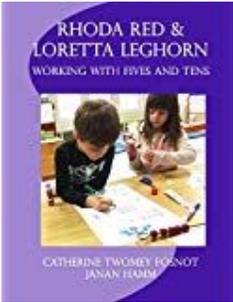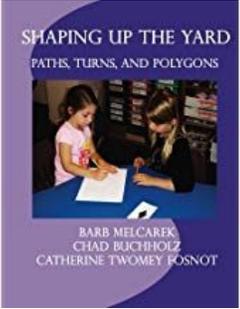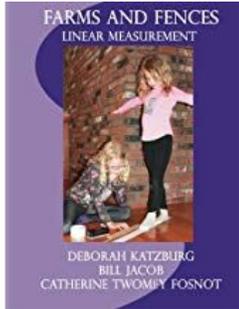# Crosswalk between the Ontario Grade Level Expectations and Contexts for Learning Mathematics
Compiled by Jennifer Burrows and Melissa Peddie

Context For Learning Math	Ontario Grade Level Expectations	Description of Content in Unit
Baby's Wild Adventure	Kindergarten: OE17: Describe, sort, classify, build and compare 2D shapes and describe the location and movement of objects. Grade 1 Geometry & Spatial Sense ● Identify and describe common 2D shapes using concrete materials and pictorial representations. ● Describe the relative locations using objects on concrete maps.	Builds on the early core geometries of shape recognition and navigation. Engages children in movement, navigation, early map-making, and exploring and drawing 2-dimensional shapes.
Rhoda Red & Loretta Leghorn **Storybook:** **The Gang's All Here** **Are you all here?** 	Kindergarten:OE15: Students will demonstrate an understanding of numbers, using concrete materials to explore and investigate counting, quantity and number relationships. Students investigate quality and equality. They will compose and decompose quantities to 10 and demonstrate an understanding of number relationships to 10. Students will investigate addition and subtraction in everyday experiences. Grade 1 Number Sense & Numeration ==(A strong focus on numbers to 10. A unit for the start of the year: Number Sense)== ● Relate numbers to the anchors of 5 and 10. ● Compose and decompose numbers to (10) in a variety of ways, using concrete materials. ● Solve a variety of problems involving the addition and subtraction of whole numbers to (10), using concrete materials and drawings. ● Solve problems involving the addition and subtraction of	This unit introduces the 5 & 10 bead Mathracks. It builds on children's innate ability to subitize small amounts (1,2,& 3) and uses it to develop the five structure, eventually supporting children to see for example, 5 inside of 7, and 5 inside of 8. In the second week of the unit the 10-structure is developed, first as 5+5, and then relationships between **equivalent** facts are explored and developed using compensation and associativity, for example, 3 + 7 = 4 + 6 = 5 +5

	single-digit whole numbers, using a variety of mental strategies.	
Shaping Up the Yard Storybook: **Uncle Lloyd's Lawnmower** SHAPING UP THE YARD PATHS, TURNS, AND POLYGONS BARB MELCAREK CHAD BUCHHOLZ CATHERINE TWOMEY FOSNOT	<u>Grade 1 Number Sense & Numeration</u> ● Divide whole objects into parts and identify and describe, through investigation, equal sized parts of the whole using fractional names (halves, fourths, and quarters). <u>Grade 1 Geometry & Spatial Sense</u> ● Identify and describe common two dimensional shapes and sort and classify them by their attributes, using concrete materials and pictorial representations. ● Trace and identify the two-dimensional faces of three dimensional figures using concrete models. ● Compose patterns, pictures and designs using two dimensional shapes. ● Identify and describe shapes within other shapes <u>Grade 2 Geometry & Spatial Sense</u> ● Distinguish between the attributes of an object that are geometric properties (e.g., number of sides, number of faces) and the attributes that are not geometric properties (e.g., colour, size, texture) using a variety of tools. ● Identify and describe various polygons (hexagon, triangle, rectangle, square), using concrete materials and pictorial representations.	The focus of this unit is the early development of children's ideas about the navigation and shape. By fostering exploration of the shapes of large-scale, navigable surface layouts and small scale drawn shapes, children are supported to coordinate two core geometries: (1) navigation, comprised of the properties of distance and direction; and (2) two dimensional shapes, comprised of the properties of sides and angles.

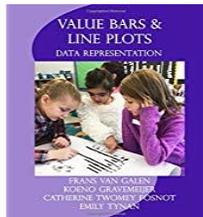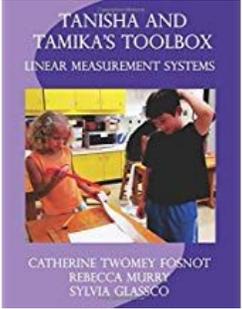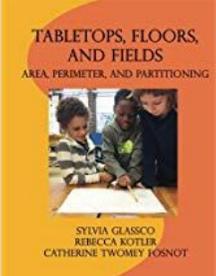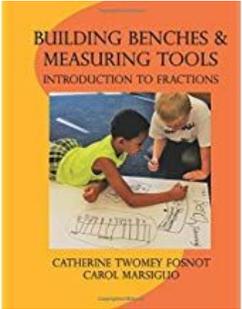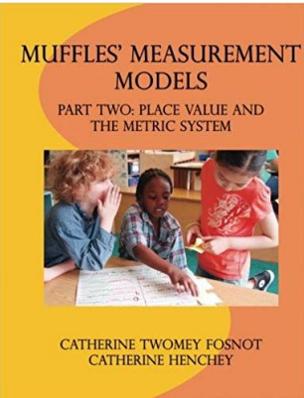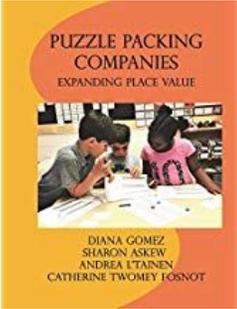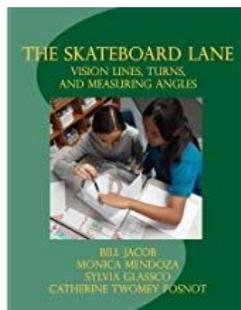|		
Farms and Fences FARMS AND FENCES LINEAR MEASUREMENT DEBORAH KATZBURG BILL JACOB CATHERINE TWOMEY FOSNOT	Grade 2 Number Sense ● Represent, compare whole numbers to 100 on a numberline ● Solve problems involving addition and subtraction of whole numbers to 18 using a variety of strategies. Grade 2 Measurement ● Estimate, measure and record length, perimeter using non-standard and standard units. ● Students will select and justify the choice of a standard unit to measure length. ● Record and represent measurements of length, height, and distance in a variety of ways (written, pictorial, concrete). Grade 3 Measurement ● Estimate, measure and record the perimeter of two-dimensional shapes, through investigation using standard units. ● Compare standard units of length and select and justify the most appropriate standard unit to measure length. ● Compare objects on the basis of linear measurements in centimetres and/or metres in problem-solving contexts.	Supports children to construct length as a linear span, from point to point, that can be measured with an iteration of smaller linear units. The need for a common standard unit emerges and ==**feet and centimetres** are introduced.==
Value Bars & Line Plots VALUE BARS & LINE PLOTS DATA REPRESENTATION FRANS VAN GALEN KOENO GRAVEMEIJER CATHERINE TWOMEY FOSNOT EMILY TYNAN	Grade 2 Number Sense & Numeration ● Locate whole numbers to 100 on a number line and on a partial number line Grade 2 Data Management ● Organize primary data that is categorized and display the data using one to one correspondence in line plots and value bars, with appropriate titles and labels. ● Students will read primary data presented in concrete graphs; simple bar graphs and line plots.	Introduces data representation using value bars and line plots. With value bars, children graph heights of animals and the length of their jumps. With line plots age frequencies and hitting the target number in a game are plotted. By the end of the unit, students are analyzing the shape of the data and drawing conclusions about it.

	● Describe data using mathematical language. ● Pose and answer questions about class generated data in line plots and simple bar graphs. ● Students will distinguish between numbers that represent data values and numbers that represent the frequency of an event. ● Demonstrate an understanding of data displayed in a graph, by comparing different parts of the data and by making statements about the data as a whole.	
Tanisha and Tamika's Toolbox	**Imperial and Metric conversions** **Begins with:Inches, feet, yards and then centimetre to metre Strings involve addition and subtraction and then conversion strings with cm/m** <u>Grade 3 Number Sense & Numeration</u> ● Solve problems involving addition and subtraction of two digit numbers, using a variety of mental strategies. ● Use estimation when solving problems involving addition and subtraction to help judge the reasonableness of a solution. <u>Grade 3 Measurement</u> ● Compare standard units of length.	Focuses on the development of linear measurement systems, including the relationship between inches, feet, yards and between centimetres and metres. The unit also promotes the development of the open number line model and a double number line. This unit further develops Farms and Fences and Measuring for the Art Show (non-standard). Supports the development of linear measurement. Conversion of imperial units and metric units. Estimate from imperial to metric.
Tabletops, Floors and Fields	<u>Gr. 3 Number Sense and Numeration</u> ● Multiply to 7 x 7 and divide to 49 ÷ 7, using a variety of mental strategies. <u>Gr. 3 Measurement</u> ● Estimate, measure (i.e., using centimetre grid paper, arrays), and record area (e.g., if a row of 10 connecting cubes is approximately the width of a book, skip counting down the cover of the book with the row of cubes [i.e., counting 10, 20, 30, ...] is one way to determine the area of the book cover). <u>Gr. 3 Geometry and SS</u> ● Identify and compare various polygons (i.e., triangles, quadrilaterals, pentagons, hexagons, heptagons, octagons) and sort them by their geometric properties (i.e., number of sides; side lengths; number of	Designed to promote mathematical inquiry on area and perimeter by decomposing and rearranging, and to support students' growing understanding of the properties of multiplication.

	interior angles; number of right angles). ● Explain the relationships between different types of quadrilaterals (e.g., a square is a rectangle because a square has four sides and four right angles; a rhombus is a parallelogram because opposite sides of a rhombus are parallel). <u>Gr. 4 Number Sense & Numeration</u> ● Multiply to 9 x 9 and divide to 81 ÷ 9, using a variety of mental strategies (e.g., doubles, doubles plus another set, skip counting). ● Solve problems involving the multiplication of one-digit whole numbers, using a variety of mental strategies (e.g., 6 x 8 can be thought of as 5 x 8 + 1 x 8). <u>Gr. 4 Measurement</u> ● Determine, through investigation, the relationship between the side lengths of a rectangle and its perimeter and area (Sample problem: Create a variety of rectangles on a geoboard. Record the length, width, area, and perimeter of each rectangle on a chart. Identify relationships.). ● Pose and solve meaningful problems that require the ability to distinguish perimeter and area (e.g.,"I need to know about area when I cover a bulletin board with construction paper. I need to know about perimeter when I make the border."). <u>Gr. 4 Geometry and Spatial Sense</u> ● Identify and compare different types of quadrilaterals (i.e., rectangle, square, trapezoid, parallelogram, rhombus) and sort and classify them by their geometric properties (e.g., sides of equal length; parallel sides; symmetry; number of right angles).	
Building Benches & Measuring Tools BUILDING BENCHES & MEASURING TOOLS INTRODUCTION TO FRACTIONS CATHERINE TWOMEY FOSNOT CAROL MARSIGLIO	<u>Gr. 4 - Number Sense & Numeration:</u> ==Measurements are Imperial- inches and feet== ==This measurement system may be appropriate for the Ontario context as it relates to construction measurements (almost always in Imperial in Ontario) and the numbers lend themselves to halves, fourths, eighths. The curriculum connections would then be more focused on the number sense rather than measurement.== ● Represent fractions using concrete materials, words and standard fractional notations and explain the meaning of the denominator as the number of the fractional parts of a whole or a set, and the numerator as the number of fractional parts being considered. ● Compare and order fractions (i.e., halves, thirds, fifths, tenths) by considering the size and number of fractional parts. ● Compare fractions to the benchmarks of 0 , ½ , and 1. ● Count forward by halves, thirds, fourths and tenths to beyond one	Landmark fractions are introduced in the context of measurement. As students work to determine the overall length of benches they are faced with units that need to be decomposed into fractional pieces.

whole, using concrete materials and number lines.
- Demonstrate and explain the relationship between equivalent fractions, using concrete materials and drawings.

<mark>(There are also some grade 3 connections, however the concern is that the Ontario curriculum clearly states "without using standard fraction notation)</mark>

Grade 3 - Number Sense & Numeration
- Divide whole objects and sets of objects into equal parts, and identify the parts using fractional names (e.g., one half; three thirds; two fourths or two quarters), without using numbers in standard fractional notation.

<mark>*Note: The unit names the fractions using numbers, so this may not be an appropriate curriculum connection*</mark>
- Relate multiplication of one-digit numbers and division by one digit divisors to real-life situations, using a variety of tools and strategies.
- Multiply (to 7 x 7 and divide to 49 ÷ 7) using a variety of mental strategies.

<mark>*There is the potential for connections to measurement if there is a metric version that is developed.*</mark>

| **Muffles' Measurement Models: Part Two**

MUFFLES' MEASUREMENT MODELS
PART TWO: PLACE VALUE AND THE METRIC SYSTEM

CATHERINE TWOMEY FOSNOT
CATHERINE HENCHEY | Grade 4 Number Sense & Numeration
- Solve problems involving the multiplication of one-digit whole numbers, using a variety of mental strategies.
- Multiply whole numbers by 10, 100, and 1000, and divide whole numbers by 10 and 100, using mental strategies.
- Demonstrate an understanding of simple multiplicative relationships involving unit rates, through investigation using concrete materials and drawings.

Grade 4 Measurement
- Estimate, measure, and record length, height, and distance, using standard units.
- Describe, through investigation, the relationship between various units of length (i.e., millimetre, centimetre, decimetre, metre, kilometre).
- Determine, through investigation, the relationship between grams and kilograms.
- Determine, through investigation, the relationship between millilitres and litres.

Grade 5 Number Sense & Numeration
- Solve problems involving the addition, subtraction,and multiplication | PART TWO: **This unit focuses on place value and the metric system.** *Muffles, a baker is introduced to students in Muffles' Truffles, a previous CFLM unit that provides various opportunities to explore multiplication using arrays.* Muffles in this unit needs **conversion tables** for his recipes. Children explore measurement conversions and develop several tables for converting litres to millilitres, pounds to ounces, inches to feet and yards, centimetres to metres and kilometres, grams to kilograms, minutes to hours and seconds, and dollars to dimes and pennies. Children are asked to select and use appropriate measurement unit, to compare and reate the measurements, to construct the need for decomposition of units into smaller units, and to use operations to convert units. |

		of whole numbers, using a variety of mental strategies. ● Multiply decimal numbers by 10, 100, 1000,and 10 000,and divide decimal numbers by 10 and 100, using mental strategies. ● Demonstrate an understanding of simple multiplicative relationships involving whole-number rates, through investigation using concrete materials and drawings. Grade 5 Measurement ● Solve problems requiring conversion from metres to centimetres and from kilometres to metres.	
Puzzle Packing Companies Expanding Place Value	*This unit lays the foundation for an understanding of decimals by developing a deep understanding of how place value positions are related by powers of 10.* Grade 5 Number Sense & Numeration ● Demonstrate an understanding of place value in whole numbers from 0 to 100,000 using a variety of tools and strategies. ● Solve problems that arise from real-life situations and that relate to the magnitude of whole numbers up to 100,000. ● Solve problems involving the addition, subtraction and multiplication of whole numbers, using a variety of mental strategies (e.g., commutative property;associative property). Grade 6 Number Sense & Numeration ● Represent compare and order whole numbers from 0 to 1,000,000, using a variety of tools (e.g., number lines with appropriate increments) ● Demonstrate an understanding of place value in whole numbers from 0 to 1,000,000 using a variety of tools and strategies. ● Solve problems that arise from real-life situations and that relate to the magnitude of whole numbers up to 1,000,000. ● Use a variety of mental strategies to solve addition, subtraction, multiplication and division problems involving whole numbers (e.g., commutative property; associative property). ● Solve problems involving the multiplication and division of whole numbers using a variety of tools and strategies.	Fosters multiplication and division by powers of ten, the use of subtraction and addition algorithms based on place value within 100,000 and prepares the way for place value to 1,000,000.

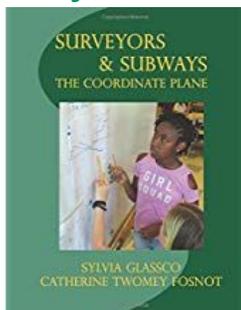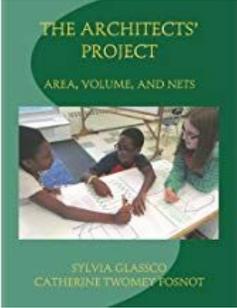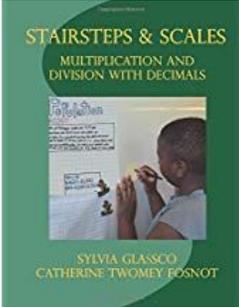| The Skateboard Lane	Grade 4 Geometry and Spatial Sense ● Identify benchmark angles (i.e., straight angle, right angle, half a right angle), using a reference tool (e.g., paper and fasteners, pattern blocks, straws), and compare other angles to these benchmarks. ● Relate the names of the benchmark angles to their measures in degrees. Grade 5 Geometry and Spatial Sense ● Identify and classify acute, right, obtuse, and straight angles. ● Measure and construct angles up to 90º, using a protractor.	Part One of a two-unit sequence on angles. As students explore vision lines in a skateboard park, they are faced with the dilemma of how to measure the angles they make when they turn from one vision line to another. Students make measurement tools and are introduced to the protractor.
Surveyors and Subways	Grade 5 Number Sense & Numeration ● Demonstrate an understanding of simple multiplicative relationships involving whole-number rates, through investigation using concrete materials and drawings. Grade 5 Geometry and Spatial Sense ● Locate an object using the cardinal directions (i.e., north, south, east, west) and a coordinate system (e.g.,"If I walk 5 steps north and 3 steps east, I will arrive at the apple tree."). ● Compare grid systems commonly used on maps (i.e., the use of numbers and letters to identify an area; the use of a coordinate system based on the cardinal directions to describe a specific location). Grade 5 Patterning and Algebra ● Make a table of values for a pattern that is generated by adding or subtracting a number to get the next term, or by multiplying or dividing by a constant to get the next term, given either the sequence or the pattern rule in words. Grade 6 Geometry and Spatial Sense ● Explain how a coordinate system represents location, and plot points in the first quadrant of a Cartesian coordinate plane. Grade 6 Patterns and Algebra ● Make tables of values for growing patterns, given pattern rules in words , then list the ordered pairs and plot the points in the first	A grid system is introduced as a measurement tool for surveyors. At first only the first quadrant of the coordinate plane is used, but students very naturally extend it to include all 4 quadrants as they design subway tracks to get to city landmarks.

	quadrant, using a variety of tools. <u>Grade 7 Number Sense and Numeration</u> ● Identify and compare integers found in real-life contexts ● Represent and order integers, using a variety of tools (number lines, two-coloured counters). <u>Grade 7 Patterning and Algebra</u> ● Represent linear growing patterns; plot the coordinates on a graph	
The Architects' Project	*==Although this unit is better suited to grade 6 (due to the surface area of prisms component), there are grade 5 expectations also met. This should likely be suggested as grade 6, but it would be good to include all of the grade 5 expectations that would be reviewed for students.==* <u>Grade 5 Number Sense & Numeration</u> ● Multiply two-digit whole numbers by two-digit whole numbers, using estimation, student-generated algorithms,and standard algorithms. <u>Grade 5 Measurement</u> ● Determine, through investigation using a variety of tools (e.g., concrete materials, dynamic geometry software, grid paper) and strategies (e.g., building arrays), the relationships between the length and width of a rectangle and its area and perimeter, and generalize to develop the formulas. ● Determine, through investigation using stacked congruent rectangular layers of concrete materials, the relationship between the height, the area of the base, and the volume of a rectangular prism, and generalize to develop the formula. <u>Grade 5 Geometry and Spatial Sense</u> ● Identify prisms (and pyramids) from their nets. ● Construct nets of prisms (and pyramids), using a variety of tools. <u>Grade 6 Number Sense & Numeration</u> ● Use a variety of mental strategies to solve addition, subtraction, multiplication, and division problems involving whole numbers (e.g., use the commutative property: 4 x 16 x 5 = 4 x 5 x 16, which gives 20 x 16 = 320; use the distributive property: (500 + 15) ÷ 5 = 500 ÷ 5 + 15 ÷ 5, which gives 100 + 3 = 103). ● Multiply (and divide) decimal numbers to tenths by whole numbers, using concrete materials, estimation,algorithms,and calculators. <u>Grade 6 Measurement</u> ● Determine, through investigation using a variety of tools and	Develops area formulas for various polygons and volume formulas for various prisms. The relationship between surface area and volume of prisms is also explored. This unit aligns best with grade 6, but is a nice challenge to develop area, volume, surface area of prisms with 5th graders.

	strategies, the relationship between the area of a rectangle and the areas of parallelograms and triangles, by decomposing and composing. ● Develop the formulas for the area of a parallelogram (i.e., Area of parallelogram = base x height) and the area of a triangle [i.e., Area of triangle = (base x height) ÷ 2], using the area relationships among rectangles, parallelograms, and triangles. ● Solve problems involving the estimation and calculation of the areas of triangles and the areas of parallelograms. ● Solve problems involving the estimation and calculation of the surface area and volume of triangular and rectangular prisms. <u>Grade 6 Geometry and SS</u> ● Explain how a coordinate system represents location, and plot points in the first quadrant of a Cartesian coordinate plane.	
Stairsteps & Scales 	<u>Grade 6 Number Sense</u> ● Multiply and divide decimal numbers by 10, 100,1000, and 10 000 using mental strategies. ● Demonstrate an understanding of place value in whole numbers and decimals numbers from 0.001 to 1 000 000 using a variety of tools and strategies. ● Multiply whole numbers by 0.1, 0.01 and 0.001 using mental strategies. ● Multiply and divide decimal numbers by 10, 100, 1000 and 10,000 using mental strategies. <u>Grade 7 Number Sense</u> ● Represent, compare and order decimals to hundredths using a variety of tools. ● Explain the relationship between exponential notation and the measurement of area. ● Divide whole numbers by decimal numbers to hundredths using concrete materials. ● Solve problems involving the multiplication and division of decimal numbers to thousandths by one-digit whole numbers using a variety of tools (concrete materials, drawings, calculators) and strategies (e.g., estimation, algorithms). ● Solving multi-step problems arising from real-life contexts and involving whole numbers and decimals, using a variety of tools (e.g., concrete materials, drawings, calculators) and strategies. ● Evaluate expressions that involve whole numbers and decimals, including expressions that contain brackets, using order of operations.	The focus of this unit is the extension of student's understanding of decimal operations to include multiplication and division. It is designed to be used after *Puzzle Packing Companies*, a Grade 5/6 unit in the place value strand which helped students build a multiplicative structuring of the base-10 system, and *The Mystery of the Meter a grade 5/6* unit which introduced place values smaller than one and helped students recognize that they can use whole number computation strategies with decimal values. This unit continues that work with investigations that encourage students to identify the place value patterns that occur when multiplying and dividing decimal values by powers of ten. As students also begin to isolate place value shifts within decimal numbers, they construct meaningful strategies for multiplying and dividing decimals by decimals.