Dennis-Yarmouth Regional School District
Mathematics Scope and Sequence
Grade: 4

Unit Name	Unit Description / Overview	Enduring Understandings - Students will understand that...	Essential Questions	Standards
Module 1 Place Value, Rounding, and Algorithms for Addition and Subtraction	In this 25-day Grade 4 module, students extend their work with whole numbers. They begin with large numbers using familiar units (hundreds and thousands) and develop their understanding of millions by building knowledge of the pattern of times ten in the base ten system on the place value chart (4.NBT.1). They recognize that each sequence of three digits is read as hundreds, tens, and ones followed by the naming of the corresponding base thousand unit (thousand, million, billion)	-the place value chart and placement of commas for naming base thousand units. -a digit represents 10 times the value of what it represents in the place to its right.	-How does place value understanding and the role of commas help you to read the value in the millions? -How can I represent mathematics in an equation to solve a problem? -How does a digit's position affect its value? -Why is the standard algorithm an efficient method for addition and subtraction?	4.NBT.A Generalize place value understanding for multi-digit whole numbers less than or equal to 1000000. 4.NBT.A.1 Recognize that in a multi-digit whole number a digit in any place represents 10 times as much as it represents in the place to its right. 4.NBT.A.2 Read and write multi-digit whole numbers using base-ten numerals number names and expanded form. Compare two multi-digit numbers based on meanings of the digits in each place using > = and 4.NBT.A.3 Use place value understanding to round multi-digit whole numbers to any place. 4.NBT.B Use place value understanding and properties of operations to perform multi-digit arithmetic on whole numbers less than or equal to 1000000. 4.NBT.B.4 Fluently add and subtract multi-digit whole numbers using the standard algorithm. 4.OA.A.3 Solve multi-step word problems posed with whole numbers and having whole-number answers using the four operations including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding. 4.OA.A.3.a Know multiplication facts and related division facts through 12 x12.
Module 2 Unit Conversions and Problem Solving with Metric Measurement	In order to explore the process of working with mixed units, Module 2 focuses on length, mass, and capacity in the metric system1 where place value serves as a natural guide for moving between larger and smaller units	When converting measurements within one system, the size, length, mass, volume of the object remains the same.	Why does the size, length, mass, volume of an object remain the same when converted to another unit of measurement?	4.MD.A.1 Know relative sizes of measurement units within one system of units including km m cm; kg g; lb oz.; l ml; hr min sec. Within a single system of measurement express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table. 4.MD.A.2 Use the four operations to solve word problems involving distances intervals of time liquid volumes masses of objects and money including problems involving simple fractions or decimals and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale. MP.1 Make sense of problems and persevere in solving them. MP.7 Look for and make use of structure. MP.8 Look for and express regularity in repeated reasoning.

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Module 3 -Multi-Digit Multiplication and Division	In this 43-day module, students use place value understanding and visual representations to solve multiplication and division problems with multi-digit numbers. As a key area of focus for Grade 4, this module moves slowly but comprehensively to develop students' ability to reason about the methods and models chosen to solve problems with multi-digit factors and dividends.	-Place value is based on groups of ten and the value of a number is determined by the place of its digits. -Whole numbers are read from left to right using the name of the period; commas are used to separate periods. -A number can be written using its name, standard, or expanded form. -The distributive property is connected to the area model and/or partial products method of multiplication. -Multiplication and division are inverse operations. -Some division situations will produce a remainder, but the remainder should always be less than the divisor. If the remainder is greater than the divisor, that means at least one more can be given to each group (fair sharing) or at least one more group of the given size (the dividend) may be created. -B4When using division to solve word problems, how the remainder is interpreted depends on the problem.	How does the position of a digit in a number affect its value, and how can the values of digits be used to compare two numbers? In what ways can numbers be composed and decomposed? How are the factors of a number determined? What is the difference between a prime number and composite number? How are multiplication and division related? What are efficient methods for finding products and quotients? How are dividends, divisors, quotients, and remainders related? What real-life situations require the use of multiplication or division? How does a remainder affect the answer in a division word problem?	4.MD.A.3 Apply the area and perimeter formulas for rectangles in real-world and mathematical problems. 4.NF.C Understand decimal notation for fractions and compare decimal fractions. 4.NF.C.5 Express a fraction with denominator 10 as an equivalent fraction with denominator 100 and use this technique to add two fractions with respective denominators 10 and 100. 4.NF.C.6 Use decimal notation to represent fractions with denominators 10 or 100. 4.OA.A Use the four operations with whole numbers to solve problems. 4.OA.A.1 Interpret a multiplication equation as a comparison e.g. interpret 35 = 5 x 7 as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations. 4.OA.A.2 Multiply or divide to solve word problems involving multiplicative comparison e.g. by using drawings and equations with a symbol for the unknown number to represent the problem distinguishing multiplicative comparison from additive comparison. 4.OA.A.3 Solve multi-step word problems posed with whole numbers and having whole-number answers using the four operations including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding. 4.OA.B Gain familiarity with factors and multiples. 4.OA.B.4 Find all factor pairs for a whole number in the range 1-100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1-100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1-100 is prime or composite.

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Module 4- Angle Measure and Plane Figures	This 20-day module introduces points, lines, line segments, rays, and angles, as well as the relationships between them. Students construct, recognize, and define these geometric objects before using their new knowledge and understanding to classify figures and solve problems. With angle measure playing a key role in the work throughout the module, students learn how to create and measure angles, as well as how to create and solve equations to find unknown angle measures. In these problems, where the unknown angle is represented by a letter, students explore both measuring the unknown angle with a protractor and reasoning through the solving of an equation. This connection between the measurement tool and the numerical work lays an important foundation for success with middle-school geometry and algebra. Through decomposition and composition activities, as well as an exploration of symmetry, students recognize specific attributes present in two-dimensional figures. They further develop their understanding of these attributes as they classify two-dimensional figures.	Shapes can be classified by properties of their lines and angles. Angles are measured in the context of a central angle of a circle. Angles are composed of smaller angles.	What are the types of angles and the relationships? How are angles applied in the context of a circle? How are parallel lines and perpendicular lines used in classifying two-dimensional shapes? How are protractors used to measure and aid in drawing angles and triangles? How can an addition or subtraction equation be used to solve a missing angle measure when the whole angle has been divided into two angles and only one measurement is given?	4.G.A Draw and identify lines and angles and classify shapes by properties of their lines and angles. 4.G.A.1 Draw points lines line segments rays angles (right acute obtuse) and perpendicular and parallel lines. Identify these in two-dimensional figures. 4.G.A.2 Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines or the presence or absence of angles of a specified size. Recognize right triangles as a category and identify right triangles. 4.G.A.3 Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts. Identify line-symmetric figures and draw lines of symmetry. 4.MD.C.5.a An angle is measured with reference to a circle with its center at the common endpoint of the rays by considering the fraction of the circular arc between the points where the two rays intersect the circle. An angle that turns through 1/360 of a circle is called a "one-degree angle" and can be used to measure angles. 4.MD.C.5.b An angle that turns through n one-degree angles is said to have an angle measure of n degrees. 4.MD.C.6 Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure. 4.MD.C.7 Recognize angle measure as additive. When an angle is decomposed into non-overlapping parts the angle measure of the whole is the sum of the angle measures of the parts. Solve addition and subtraction problems to find unknown angles on a diagram in real-world and mathematical problems e.g. by using an equation with a symbol for the unknown angle measure.

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Module 5 - Fraction Equivalence, Ordering, and Operations	In this 45-day module, students build on their Grade 3 work with unit fractions as they explore fraction equivalence and extend this understanding to mixed numbers. This leads to the comparison of fractions and mixed numbers and the representation of both in a variety of models. Benchmark fractions play an important part in students' ability to generalize and reason about relative fraction and mixed number sizes. Students then have the opportunity to apply what they know to be true for whole number operations to the new concepts of fraction and mixed number operations. Students begin Topic A by decomposing fractions and creating tape diagrams to represent them as sums of fractions with the same denominator in different ways They proceed to see that representing a fraction as the repeated addition of a unit fraction is the same as multiplying that unit fraction by a whole number. This is already a familiar fact in other contexts.	Fractions can be represented visually and in written form. Comparisons are valid only when the two fractions refer to the same whole. Fractions and Mixed Numbers are composed of unit fractions and can be decomposed as a sum of unit fractions. Improper Fractions and Mixed Numbers represent the same value. Addition and subtraction of fractions involves joining and separating parts referring to the same whole. A product of a fraction times a whole number can be written as a multiple of a unit fraction.	How are fractions used in problem-solving situations? How are fractions composed, decomposed, compared and represented? Why is it important to identify, label, and compare fractions as representations of equal parts of a whole or of a set? How can multiplying a whole number by a fraction be displayed as repeated addition (as a multiple of a unit fraction)?	4.MD.B.4 Make a line plot (dot plot) representation to display a data set of measurements in fractions of a unit. Solve problems involving addition and subtraction of fractions by using information presented in line plots (dot plots). 4.NF.A Extend understanding of fraction equivalence and ordering for fractions with denominators 2 3 4 5 6 8 10 12 and 100. 4.NF.A.1 Explain why a fraction a/b is equivalent to a fraction (n xa)/(n x b) by using visual fraction models with attention to how the numbers and sizes of the parts differ even though the two fractions themselves are the same size. 4.NF.A.2 Compare two fractions with different numerators and different denominators e.g. by creating common denominators or numerators or by comparing to a benchmark fraction such as ½. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols > = or < 4.NF.B.3 Understand a fraction a/b with a > 1 as a sum of fractions 1/b. 4.NF.B.3.a Understand addition and subtraction of fractions as joining and separating parts referring to the same whole. (The whole can be a set of objects.) 4.NF.B.3.b Decompose a fraction into a sum of fractions with the same denominator in more than one way recording each decomposition by an equation. Justify decompositions 4.NF.B.3.c Add and subtract mixed numbers with like denominators e.g. by replacing each mixed number with an equivalent fraction and/or by using properties of operations and the relationship between addition and subtraction. 4.NF.B.3.d Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators 4.NF.B.4.a Understand a fraction a/b as a multiple of 1/b. 4.NF.B.4.b Understand a multiple of a/b as a multiple of 1/b and use this understanding to multiply a fraction by a whole number. 4.OA.C.5 Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself.
Module 6 - Decimal Fractions	This 20-day module gives students their first opportunity to explore decimal numbers via their relationship to decimal fractions, expressing a given quantity in both fraction and decimal forms. Utilizing the understanding of fractions developed throughout Module 5, students apply the same reasoning to decimal numbers, building a solid foundation for Grade 5 work with decimal operations. Previously referred to as whole numbers, all numbers written in the base-ten number system with place value units that are powers of 10 are henceforth referred to as decimal numbers, a set which now includes tenths and hundredths (e.g., 1, 15, 248, 0.3, 3.02, and 24.35).	Fractions with denominators of 10 can be expressed as an equivalent fraction with a denominator of 100. Fractions with denominators of 10 and 100 may be expressed using decimal notation. When comparing two decimals to hundredths, the comparisons are valid only if they refer to the same whole.	How can visual models be used to help with understanding decimals? How can visual models be used to determine and compare equivalent fractions and decimals?How would you compare and order decimals through hundredths?	4.MD.A Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit. 4.MD.A.2 Use the four operations to solve word problems involving distances intervals of time liquid volumes masses of objects and money including problems involving simple fractions or decimals and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale. 4.NF.C Understand decimal notation for fractions and compare decimal fractions. 4.NF.C.5 Express a fraction with denominator 10 as an equivalent fraction with denominator 100 and use this technique to add two fractions with respective denominators 10 and 100. 4.NF.C.7 Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole. Record the results of comparisons with the symbols > = or MP.2 Reason abstractly and quantitatively. MP.4 Model with mathematics. MP.6 Attend to precision. MP.8 Look for and express regularity in repeated reasoning.

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Module 7 - Exploring Measurement with Multiplication	In this module, students build their competencies in measurement as they relate multiplication to the conversion of measurement units. Throughout the module, students explore multiple strategies for solving measurement problems involving unit conversion.	The four operations are interconnected. Converting from larger to smaller units of measurement in the metric system is done by multiplying by powers of ten. Perimeter is a real life application of addition and subtraction. Area is a real life application of multiplication and division. There are three different structures for multiplication and division problems: Area/Arrays, Equal Groups, and Comparison, and the unknown quantity in multiplication and division situations is represented in three ways: Unknown Product, Group Size Unknown, and Number of Groups Unknown	How are the four basic operations related to one another? How are the units of measure within the metric system related? How do you find the area and perimeter of geometric figures and how can using the formulas for perimeter and area help you solve real-world problems? What real-life situations require the use of multiplication or division?	4.MD.A Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit. 4.MD.A.1 Know relative sizes of measurement units within one system of units including km m cm; kg g; lb oz.; l ml; hr min sec. Within a single system of measurement express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table. 4.MD.A.2 Use the four operations to solve word problems involving distances intervals of time liquid volumes masses of objects and money including problems involving simple fractions or decimals and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale. 4.OA.A Use the four operations with whole numbers to solve problems. 4.OA.A.1 Interpret a multiplication equation as a comparison e.g. interpret 35 = 5 x 7 as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations. 4.OA.A.2 Multiply or divide to solve word problems involving multiplicative comparison e.g. by using drawings and equations with a symbol for the unknown number to represent the problem distinguishing multiplicative comparison from additive comparison. 4.OA.A.3 Solve multi-step word problems posed with whole numbers and having whole-number answers using the four operations including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding. 4.OA.A.3.a Know multiplication facts and related division facts through 12 x 12. MP.2 Reason abstractly and quantitatively. MP.3 Construct viable arguments and critique the reasoning of others. MP.7 Look for and make use of structure. MP.8 Look for and express regularity in repeated reasoning.