Dennis-Yarmouth Regional School District
Mathematics Scope and Sequence
Grade: 3

Unit Name	Unit Description / Overview	Enduring Understandings - Students will understand that...	Essential Questions	Standards
M1: Properties of Multiplication and Division and Solving Problems with Units of 2–5 and 10	This 25-day module begins the year by building on students' fluency with addition and their knowledge of arrays. In Topic A, students initially use repeated addition to find the total from a number of equal groups (2.OA.4). As students notice patterns, they let go of longer addition sentences in favor of more efficient multiplication facts (3.OA.1).	Multiplication can be represented as an array model. Division is the inverse of multiplication and every multiplication equation has a corresponding division sentence (fact families). Division is a mathematical operation that be thought of as a missing factor problem in a multiplication sentence.	How are the concepts of repeated addition, multiplication and division related?	3.OA.A.1 Interpret products of whole numbers e.g. interpret 5 x 7 as the total number of objects in five groups of seven objects each. 3.OA.A.2 Interpret whole-number quotients of whole numbers e.g. interpret 56÷ 8 as the number of objects in each share when 56 objects are partitioned equally into 8 shares or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each. 3.OA.A.3 Use multiplication and division within 100 to solve word problems in situations involving equal groups arrays and measurement quantities e.g. by using drawings and equations with a symbol for the unknown number to represent the problem. 3.OA.A.4 Determine the unknown whole number in a multiplication or division equation relating three whole numbers. 3.OA.B.5 Apply properties of operations to multiply. 3.OA.B.6 Understand division as an unknown-factor problem. 3.OA.C.7 Fluently multiply and divide within 100 using strategies such as the relationship between multiplication and division (e.g. knowing that 8 x 5 = 40 one knows 40 Ã5 = 8) or properties of operations. By the end of grade 3 know from memory all products of two single-digit numbers and related division facts. 3.OA.D.8 Solve two-step word problems using the four operations for problems posed with whole numbers and having whole number answers. 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. MP.1 Make sense of problems and persevere in solving them. MP.2 Reason abstractly and quantitatively. MP.3 Construct viable arguments and critique the reasoning of others. MP.4 Model with mathematics. MP.7 Look for and make use of structure.

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Fluently multiply and divide within 100	Students will be able to independently use their learning to… achieve fluency with all single digit multiplications and divisions. Computational fluency refers to having efficient and accurate methods for computing. Students exhibit computational fluency when they demonstrate flexibility in the computational methods they choose, understand and can explain these methods, and produce accurate answers efficiently. The computational methods that a student uses should be based on mathematical ideas that the student understands well, including the structure of the base-ten number system, properties of multiplication and division, and the relationships between operations. Adapted from Principles and Standards for School Mathematics (p. 152). Mastery: "A child can give a quick response without resorting to non-efficient means, such as counting." Van de Walle & Lovin, 2006,p. 94	The meanings of multiplication and division as groups of and array models Relationship between Multiplication and division: 4 x 7 = 28 has 2 related division facts Division as an unknown factor 8 x 5 helps me know 40 divided by 8. Multiplication is commutative (When multiplying numbers order does not matter). Associative property- The product of 3 x 5 x 2 can be found by 3 x 5 = 15 then 15 x 2 = 30, or by 5 x 2 = 10 then 3 x 10 = 30) Distributive property-When multiplying two numbers either number can be decomposed and multiplied. Property of 1 for multiplication: when a number is multiplied by 1 the result is the same number. Identity Property for 0: when a number is multiplied by a quantity of 0 Students need not use formal terms for these properties. Students are not expected to use distributive notation.	What patterns do you notice? Will that pattern work for other computations? Which? How did you solve ____? (students draw and explain) How is that same/different than another solution? How can you create an easier problem?	3.OA.C Multiply and divide within 100. 3.OA.C.7 Fluently multiply and divide within 100 using strategies such as the relationship between multiplication and division (e.g. knowing that 8 x 5 = 40 one knows 40÷ 5 = 8) or properties of operations. By the end of grade 3 know from memory all products of two single-digit numbers and related division facts.
M2:Place Value and Problem Solving with Units of Measure	In this 25-day module, students explore measurement using kilograms, grams, liters, milliliters, and intervals of time in minutes.	Units of measurement may be made up of smaller units of measurement. Rounding is a way to assess the reasonableness of solutions to problems.	How can place value understanding help us solve problems involving units of measure?	3.MD.A.1 Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes e.g. by representing the problem on a number line diagram. 3.MD.A.2 Measure and estimate liquid volumes and masses of objects using standard metric units of grams (g) kilograms (kg) and liters (l). Add subtract multiply or divide to solve one-step word problems involving masses or volumes that are given in the same metric units e.g. by using drawings (such as a beaker with a measurement scale) to represent the problem. 3.NBT.A.1 Use place value understanding to round whole numbers to the nearest 10 or 100. 3.NBT.A.2 Fluently add and subtract within 1000 using strategies and algorithms based on place value properties of operations and/or the relationship between addition and subtraction. MP.2 Reason abstractly and quantitatively. MP.4 Model with mathematics. MP.6 Attend to precision. MP.7 Look for and make use of structure.

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M3: Multiplication and Division with Units of 0, 1, 6–9, and Multiples of 10	This 25-day module builds directly on students' work with multiplication and division in Module 1. At this point, Module 1 instruction coupled with fluency practice in Module 2 has students well on their way to meeting the Grade 3 fluency expectation for multiplying and dividing within 100 (3.OA.7). Module 3 extends the study of factors from 2, 3, 4, 5, and 10 to include all units from 0 to 10, as well as multiples of 10 within 100. Similar to the organization of Module 1, the introduction of new factors in Module 3 spreads across topics. This allows students to build fluency with facts involving a particular unit before moving on. The factors are sequenced to facilitate systematic instruction with increasingly sophisticated strategies and patterns.	Division is the inverse of multiplication and every multiplication equation has a corresponding division sentence (fact families). Division is a mathematical operation that breaks quantities into equal shares or equal groups.	What are the mathematical properties that govern multiplication? How can we use those properties to solve problems using multiplication or division?	3.NBT.A.3 Multiply one-digit whole numbers by multiples of 10 in the range 10–90 (e.g. 9 × 80, 5 × 60) using strategies based on place value and properties of operations. 3.OA.A.3 Use multiplication and division within 100 to solve word problems in situations involving equal groups arrays and measurement quantities e.g. by using drawings and equations with a symbol for the unknown number to represent the problem. 3.OA.A.4 Determine the unknown whole number in a multiplication or division equation relating three whole numbers. 3.OA.B.5 Apply properties of operations to multiply. 3.OA.C.7 Fluently multiply and divide within 100 using strategies such as the relationship between multiplication and division (e.g. knowing that 8 x 5 = 40 one knows 40÷ 5 = 8) or properties of operations. By the end of grade 3 know from memory all products of two single-digit numbers and related division facts. 3.OA.D.8 Solve two-step word problems using the four operations for problems posed with whole numbers and having whole number answers. 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. 3.OA.D.9 Identify arithmetic patterns (including patterns in the addition table or multiplication table) and explain them using properties of operations. MP.1 Make sense of problems and persevere in solving them. MP.3 Construct viable arguments and critique the reasoning of others. MP.4 Model with mathematics. MP.5 Use appropriate tools strategically. MP.7 Look for and make use of structure.

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M4: Multiplication and Area	In this 20-day module, students explore area as an attribute of two-dimensional figures and relate it to their prior understandings of multiplication. In Grade 2, students partitioned a rectangle into rows and columns of same-sized squares and found the total number by both counting and adding equal addends represented by the rows or columns (2.G.2, 2.OA.4).	Area is an attribute of plane figures that can be measured.	What is area and how is it measured?	3.MD.C.5 Recognize area as an attribute of plane figures and understand concepts of area measurement. 3.MD.C.5.a A square with side length of one unit called "a unit square" is said to have "one square unit" of area and can be used to measure area. 3.MD.C.5.b A plane figure which can be covered without gaps or overlaps by n unit squares is said to have an area of n square units. 3.MD.C.6 Measure areas by counting unit squares (square cm square m square in. square ft. and non-standard units). 3.MD.C.7 Relate area to the operations of multiplication and addition. 3.MD.C.7.a Find the area of a rectangle with whole-number side lengths by tiling it and show that the area is the same as would be found by multiplying the side lengths. 3.MD.C.7.b Multiply side lengths to find areas of rectangles with whole-number side lengths in the context of solving real-world and mathematical problems and represent whole-number products as rectangular areas in mathematical reasoning. 3.MD.C.7.c Use tiling to show in a concrete case that the area of a rectangle with whole-number side lengths a and b + c is the sum of a x b and a x c. Use area models to represent the distributive property in mathematical reasoning. 3.MD.C.7.d Recognize area as additive. Find areas of rectilinear figures by decomposing them into non-overlapping rectangles and adding the areas of the non-overlapping parts applying this technique to solve real-world problems. MP.2 Reason abstractly and quantitatively. MP.3 Construct viable arguments and critique the reasoning of others. MP.6 Attend to precision. MP.7 Look for and make use of structure. MP.8 Look for and express regularity in repeated reasoning.

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M5:Fractions as Numbers on the Number Line	In this 35-day module, students extend and deepen Grade 2 practice with equal shares to understanding fractions as equal partitions of a whole (2.G.3). Their knowledge becomes more formal as they work with area models and the number line. Throughout the module, students have multiple experiences working with the Grade 3 specified fractional units of halves, thirds, fourths, sixths, and eighths. To build flexible thinking about fractions, students are exposed to additional fractional units such as fifths, ninths, and tenths.	The whole - in order to know which fraction is represented you must know what the whole is The equal parts (the idea of equal parts must be developed from the same size same shape idea constructed in second grade to parts which have equal measurement. The parts which have equal measurement are named unit fractions. To identify unit fractions in a whole, students must estimate to partition that whole. This is where our understandings of multiplication come in. Fractions are numbers that represent part(s) of a whole number. Different fractions can represent the same amount, or quantity, even though they have different numerators and denominators. Fractions can be ordered by size when their numerators or denominators are the same and they are derived from the same whole.	“What’s happening to the parts?” “How are the parts changing?” “Do you notice an increase or decrease?” “Is the amount growing or shrinking?” What does the 2 mean? What does the 1 mean? What happened to the size of an equal part when the whole was divided into more parts? What fraction of the whole strip is one of the parts? How you know that these parts are equal?	3.G.A.2 Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole. 3.NF.A.1 Understand a fraction 1/b as the quantity formed by 1 part when a whole (a single unit) is partitioned into b equal parts; understand a fraction a/b as the quantity formed by a parts of size 1/b. 3.NF.A.2 Understand a fraction as a number on the number line; represent fractions on a number line diagram. 3.NF.A.2.a Represent a unit fraction 1/b on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into b equal parts. Recognize that each part has size 1/b and that the fraction 1/b is located 1/b of a whole unit from 0 on the number line. 3.NF.A.2.b Represent a fraction a/b on a number line diagram by marking off a lengths 1/b from 0. Recognize that the resulting interval has size a/b and that its endpoint locates the number a/b on the number line. 3.NF.A.3 Explain equivalence of fractions in special cases and compare fractions by reasoning about their size. 3.NF.A.3.a Understand two fractions as equivalent (equal) if they are the same size or the same point on a number line. 3.NF.A.3.b Recognize and generate simple equivalent fractions e.g. ½ = 2/4 4/6 = 2/3. Explain why the fractions are equivalent e.g. by using a visual fraction model. 3.NF.A.3.c Express whole numbers as fractions and recognize fractions that are equivalent to whole numbers. 3.NF.A.3.d Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when the two fractions refer to the same whole. MP.2 Reason abstractly and quantitatively. MP.3 Construct viable arguments and critique the reasoning of others. MP.6 Attend to precision. MP.7 Look for and make use of structure.
M6: Collecting and Displaying Data	This 10-day module builds on Grade 2 concepts about data, graphing, and line plots.	Each type of graph is most appropriate for certain kinds of data.Intervals do not have to be whole numbers but can have fractional values that facilitate recording measurement data with greater precision.	How do you determine how much a symbol in a pictograph represents? How can you choose a scale to make a bar graph? How do you make a picture graph or a bar graph How do you make and use a line plot?	3.MD.B.3 Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in scaled bar graphs. 3.MD.B.4 Generate measurement data by measuring lengths of objects using rulers marked with halves and fourths of an inch. Record and show the data by making a line plot (dot plot) where the horizontal scale is marked off in appropriate unitsâwhole numbers halves or fourths. MP.2 Reason abstractly and quantitatively. MP.5 Use appropriate tools strategically. MP.6 Attend to precision. MP.7 Look for and make use of structure.

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M7: Geometry and Measurement Word Problems	The final module of the year offers students intensive practice with word problems, as well as hands-on investigation experiences with geometry and perimeter.	Shapes (e.g., squares, rectangles, and rhombuses) have shared attributes that can fall within a larger category (parallelograms, quadrilaterals, and trapezoids). Quadrilateral can be decomposed into two triangles. As they learn which attributes are shared, the process of comparing shapes also leads to discussion about the differences between shapes; students learn, for example, that not all rectangles are squares.	Do quadrilateals have to look like rectangles? How do you know? Do rectangles and squares always look the same? How do you know? Do you think shapes could be grouped together in the same family or classification? Explain. Does the direction that a shape is facing change the way it looks? Does it change the shape's name? Is it possible to find more than one way for shapes to fit together to make another shape? Explain. What does it mean to partition a shape into parts? How does combining and breaking apart shapes affect the perimeter and area? How might finding shapes within other shapes help me in life?	3.G.A.1 Understand that shapes in different categories (e.g. rhombuses rectangles and others) may share attributes (e.g. having four sides) and that the shared attributes can define a larger category (e.g. quadrilaterals). Compare and classify shapes by their sides and angles (right angle/non-right angle). Recognize rhombuses rectangles squares and trapezoids as examples of quadrilaterals and draw examples of quadrilaterals that do not belong to any of these subcategories. 3.MD.B.4 Generate measurement data by measuring lengths of objects using rulers marked with halves and fourths of an inch. Record and show the data by making a line plot (dot plot) where the horizontal scale is marked off in appropriate unitsâwhole numbers halves or fourths. 3.MD.D.8 Solve real-world and mathematical problems involving perimeters of polygons including finding the perimeter given the side lengths finding an unknown side length and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters. 3.OA.D.8 Solve two-step word problems using the four operations for problems posed with whole numbers and having whole number answers. 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. MP.1 Make sense of problems and persevere in solving them. MP.3 Construct viable arguments and critique the reasoning of others. MP.5 Use appropriate tools strategically. MP.6 Attend to precision.