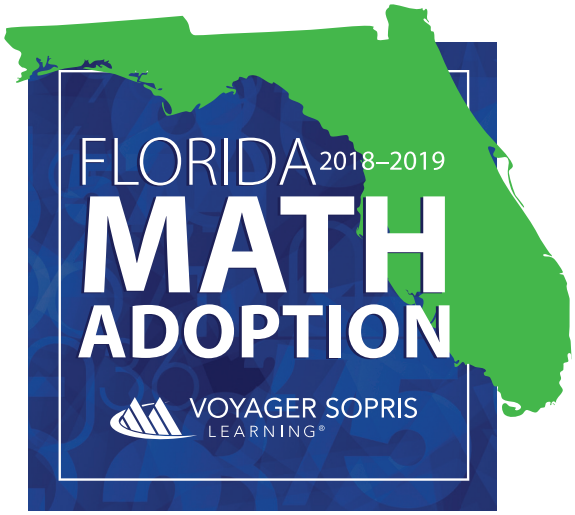

Hillsborough County

Vmath®

LEVELS C-F

STANDARDS

STANDARDS ALIGNMENT COURSE STANDARDS/BENCHMARKS (Form IM7)

SUBMISSION TITLE:	**Vmath, Level C**
GRADE LEVEL:	**2**
COURSE TITLE:	**Mathematics - Grade 2**
COURSE CODE:	**5012040**

Benchmark Code	Benchmark	Lessons Where Standard/Benchmark Is Directly Addressed In Major Tool (Most In–Depth Coverage Listed First)
MAFS.2.G.1.1	Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces. Identify triangles, quadrilaterals, pentagons, hexagons, and cubes.	Module 5: Lesson 4: 228–231 Module 5: Lesson 5: 232–235 Module 5: Lesson 6: 236–239 Module 5: Lesson 7: 240–243 Module 5: Lesson 8: 244–247 Module 5: Lesson 10: 252–255
MAFS.2.G.1.2	Partition a rectangle into rows and columns of same-size squares and count to find the total number of them.	Module 5: Lesson 9: 248–251 Module 5: Lesson 8: 244–247
MAFS.2.G.1.3	Partition circles and rectangles into two, three, or four equal shares, describe the shares using the words *halves*, *thirds*, *half of*, *a third of*, etc., and describe the whole as two halves, three thirds, four fourths. Recognize that equal shares of identical wholes need not have the same shape.	Module 7: Lesson PL1: 322–325 Module 7: Lesson PL1: 326–329 Module 7: Lesson 1: 330–333 Module 7: Lesson 2: 334–337 Module 7: Lesson 3: 338–341 Module 7: Lesson 4: 342–345 Module 7: Lesson 5: 346–349
MAFS.2.MD.1.1	Measure the length of an object to the nearest inch, foot, centimeter, or meter by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.	Module 4: Lesson PL1: 154–157 Module 4: Lesson PL2: 158–161 Module 4: Lesson 1: 162–165 Module 4: Lesson 2: 166–169 Module 4: Lesson 3: 170–173 Module 4: Lesson 4: 174–177 Module 4: Lesson 5: 178–181

Benchmark Code	Benchmark	Lessons Where Standard/Benchmark Is Directly Addressed In Major Tool (Most In–Depth Coverage Listed First)
MAFS.2.MD.1.2	Describe the inverse relationship between the size of a unit and number of units needed to measure a given object. *Example: Suppose the perimeter of a room is lined with one-foot rulers. Now, suppose we want to line it with yardsticks instead of rulers. Will we need more or fewer yardsticks than rulers to do the job? Explain your answer.*	Module 4: Lesson 5: 178–181
MAFS.2.MD.1.3	Estimate lengths using units of inches, feet, yards, centimeters, and meters.	Module 4: Lesson PL2: 158–161 Module 4: Lesson 3: 170–173
MAFS.2.MD.1.4	Measure to determine how much longer one object is than another, expressing the length difference in terms of a standard length unit.	Module 4: Lesson 2: 166–169 Module 4: Lesson 7: 186–189
MAFS.2.MD.2.5	Use addition and subtraction within 100 to solve word problems involving lengths that are given in the same units, e.g., by using drawings (such as drawings of rulers) and equations with a symbol for the unknown number to represent the problem.	Module 4: Lesson 2: 166–169 Module 4: Lesson 7: 186–189
MAFS.2.MD.2.6	Represent whole numbers as lengths from 0 on a number line diagram with equally spaced points corresponding to the numbers 0, 1, 2, . . ., and represent whole-number sums and differences within 100 on a number line diagram.	Module 4: Lesson 6: 182–185 Module 1: Lesson 2: 6–9

Benchmark Code	Benchmark	Lessons Where Standard/Benchmark Is Directly Addressed In Major Tool (Most In–Depth Coverage Listed First)
MAFS.2.MD.3.7	Tell and write time from analog and digital clocks to the nearest five minutes.	Module 6: Lesson 1: 274–277 Module 6: Lesson PL1: 266–269 Module 6: Lesson PL2: 270–273 Module 6: Lesson 2: 278–281
MAFS.2.MD.3.8	Solve one- and two-step word problems involving dollar bills (singles, fives, tens, twenties, and hundreds) or coins (quarters, dimes, nickels, and pennies) using $ and ¢ symbols appropriately. Word problems may involve addition, subtraction, and equal groups situations1. Example: The cash register shows that the total for your purchase is 59¢. You gave the cashier three quarters. How much change should you receive from the cashier?	Module 5: Lesson 1: 216–219 Module 5: Lesson 2: 220–223 Module 5: Lesson 3: 224–227
MAFS.2.MD.4.9	Generate measurement data by measuring lengths of several objects to the nearest whole unit, or by making repeated measurements of the same object. Show the measurements by making a line plot, where the horizontal scale is marked off in whole-number units.	Module 4: Lesson 8: 190–193 Module 4: Lesson 9: 194–197 Module 6: Lesson 10: 310–313

Benchmark Code	Benchmark	Lessons Where Standard/Benchmark Is Directly Addressed In Major Tool (Most In–Depth Coverage Listed First)
MAFS.2.MD.4.10	Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph.	Module 4: Lesson 10: 198–201 Module 6: Lesson 3: 282–285 Module 6: Lesson 4: 286–289 Module 6: Lesson 5: 290–293 Module 6: Lesson 6: 294–297 Module 6: Lesson 7: 298–301 Module 6: Lesson 8: 302–305 Module 6: Lesson 9: 306–309
MAFS.2.NBT.1.1	"Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones; e.g., 706 equals 7 hundreds, 0 tens, and 6 ones. Understand the following as special cases: a. 100 can be thought of as a bundle of ten tens — called a "hundred." b. The numbers 100, 200, 300, 400, 500, 600, 700, 800, 900 refer to one, two, three, four, five, six, seven, eight, or nine hundreds (and 0 tens and 0 ones)."	Module 1: Lesson 6: 22–25 Module 1: Lesson 5: 18–21
MAFS.2.NBT.1.2	Count within 1000; skip-count by 5s, 10s, and 100s.	Module 1: Lesson 3: 10–13 Module 2: Lesson 7: 82–85 Module 2: Lesson 8: 86–89 Module 7: Lesson 7: 354–357

Benchmark Code	Benchmark	Lessons Where Standard/Benchmark Is Directly Addressed In Major Tool (Most In–Depth Coverage Listed First)
MAFS.2.NBT.1.3	Read and write numbers to 1000 using base-ten numerals, number names, and expanded form.	Module 1: Lesson 5: 18–21 Module 1: Lesson 6: 22–25 Module 1: Lesson 7: 26–29 Module 1: Lesson 8: 30–33
MAFS.2.NBT.1.4	Compare two three-digit numbers based on meanings of the hundreds, tens, and ones digits, using >, =, and < symbols to record the results of comparisons.	Module 1: Lesson 10: 38–41 Module 1: Lesson 9: 34–37
MAFS.2.NBT.2.5	Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.	Module 2: Lesson PL1: 50–53 Module 2: Lesson PL2: 54–57 Module 2: Lesson 1: 58–61 Module 2: Lesson 2: 62–65 Module 2: Lesson 3: 66–69 Module 2: Lesson 4: 70–73 Module 2: Lesson 5: 74–77 Module 2: Lesson 6: 78–81 Module 2: Lesson 7: 82–85 Module 3: Lesson PL1: 102–105 Module 3: Lesson PL2: 106–109 Module 3: Lesson 1: 110–113 Module 3: Lesson 2: 114–117 Module 3: Lesson 3: 118–121 Module 3: Lesson 4: 122–125 Module 3: Lesson 6: 130–133 Module 3: Lesson 7: 134–137

Benchmark Code	Benchmark	Lessons Where Standard/Benchmark Is Directly Addressed In Major Tool (Most In–Depth Coverage Listed First)
MAFS.2.NBT.2.6	Add up to four two-digit numbers using strategies based on place value and properties of operations.	Module 2: Lesson PL1: 50–53 Module 2: Lesson PL2: 54–57 Module 2: Lesson 1: 58–61 Module 2: Lesson 2: 62–65 Module 2: Lesson 3: 66–69 Module 2: Lesson 4: 70–73 Module 2: Lesson 5: 74–77 Module 2: Lesson 6: 78–81 Module 2: Lesson 7: 82–85 Module 2: Lesson 9: 90–93 Module 2: Lesson 10: 94–97

Benchmark Code	Benchmark	Lessons Where Standard/Benchmark Is Directly Addressed In Major Tool (Most In–Depth Coverage Listed First)
MAFS.2.NBT.2.7	Add and subtract within 1000, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method. Understand that in adding or subtracting three digit numbers, one adds or subtracts hundreds and hundreds, tens and tens, ones and ones; and sometimes it is necessary to compose or decompose tens or hundreds.	Module 2: Lesson PL1: 50–53 Module 2: Lesson PL2: 54–57 Module 2: Lesson 1: 58–61 Module 2: Lesson 2: 62–65 Module 2: Lesson 3: 66–69 Module 2: Lesson 4: 70–73 Module 2: Lesson 5: 74–77 Module 2: Lesson 6: 78–81 Module 2: Lesson 7: 82–85 Module 2: Lesson 9: 90–93 Module 2: Lesson 10: 94–97 Module 3: Lesson PL1: 102–105 Module 3: Lesson PL2: 106–109 Module 3: Lesson 1: 110–113 Module 3: Lesson 2: 114–117 Module 3: Lesson 3: 118–121 Module 3: Lesson 4: 122–125 Module 3: Lesson 5: 126–129 Module 3: Lesson 6: 130–133 Module 3: Lesson 7: 134–137 Module 3: Lesson 8: 138–141 Module 3: Lesson 9: 142–145 Module 3: Lesson 10: 146–149
MAFS.2.NBT.2.8	Mentally add 10 or 100 to a given number 100–900, and mentally subtract 10 or 100 from a given number 100–900.	Module 3: Lesson 5: 126–129

Benchmark Code	Benchmark	Lessons Where Standard/Benchmark Is Directly Addressed In Major Tool (Most In–Depth Coverage Listed First)
MAFS.2.NBT.2.9	Explain why addition and subtraction strategies work, using place value and the properties of operations.	Module 2: Lesson PL1: 50–53 Module 2: Lesson PL2: 54–57 Module 2: Lesson 1: 58–61 Module 2: Lesson 2: 62–65 Module 2: Lesson 3: 66–69 Module 2: Lesson 4: 70–73 Module 2: Lesson 5: 74–77 Module 2: Lesson 6: 78–81 Module 2: Lesson 7: 82–85 Module 2: Lesson 9: 90–93 Module 2: Lesson 10: 94–97 Module 3: Lesson PL1: 102–105 Module 3: Lesson PL2: 106–109 Module 3: Lesson 1: 110–113 Module 3: Lesson 2: 114–117 Module 3: Lesson 3: 118–121 Module 3: Lesson 4: 122–125 Module 3: Lesson 5: 126–129 Module 3: Lesson 6: 130–133 Module 3: Lesson 7: 134–137 Module 3: Lesson 8: 138–141 Module 3: Lesson 9: 142–145 Module 3: Lesson 10: 146–149

Benchmark Code	Benchmark	Lessons Where Standard/Benchmark Is Directly Addressed In Major Tool (Most In–Depth Coverage Listed First)
MAFS.2.OA.1.1	Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.	Module 2: Lesson PL1: 50–53 Module 2: Lesson PL2: 54–57 Module 2: Lesson 1: 58–61 Module 2: Lesson 2: 62–65 Module 2: Lesson 3: 66–69 Module 2: Lesson 4: 70–73 Module 2: Lesson 5: 74–77 Module 2: Lesson 6: 78–81 Module 2: Lesson 7: 82–85 Module 3: Lesson PL1: 102–105 Module 3: Lesson PL2: 106–109 Module 3: Lesson 1: 110–113 Module 3: Lesson 2: 114–117 Module 3: Lesson 3: 118–121 Module 3: Lesson 4: 122–125 Module 3: Lesson 6: 130–133 Module 3: Lesson 7: 134–137
MAFS.2.OA.1.1.a	Determine the unknown whole number in an equation relating four or more whole numbers. For example, determine the unknown number that makes the equation true in the equations 37 + 10 + 10 = _____ + 18, ? – 6 = 13 – 4, and 15 – 9 = 6 + __	The following lesson helps to address the standard: Module 3: Lesson 6: 130–133

Benchmark Code	Benchmark	Lessons Where Standard/Benchmark Is Directly Addressed In Major Tool (Most In–Depth Coverage Listed First)
MAFS.2.OA.2.2	Fluently add and subtract within 20 using mental strategies. By end of Grade 2, know from memory all sums of two one-digit numbers.	Module 2: Lesson PL1: 50–53 Module 2: Lesson PL2: 54–57 Module 2: Lesson 7: 82–85 Module 2: Lesson 8: 86–89 Module 3: Lesson PL2: 106–109 Module 3: Lesson 6: 130–133 Module 3: Lesson 7: 134–137
MAFS.2.OA.3.3	Determine whether a group of objects (up to 20) has an odd or even number of members, e.g., by pairing objects or counting them by 2s; write an equation to express an even number as a sum of two equal addends.	Module 1: Lesson 4: 14–17
MAFS.2.OA.3.4	Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns; write an equation to express the total as a sum of equal addends.	Module 2: Lesson 8: 86–89
MAFS.2.MP.1.1	Make sense of problems and persevere in solving them.	Students learn the procedures of a strategy and are given tools to help them remember the procedures as they use them to build conceptual understanding. Struggling math students need reinforcement as they learn to remember these procedures. The How To box provides students with two different examples so they can repeat the procedure. For an example see: Module 6: Lesson 3: 282

Benchmark Code	Benchmark	Lessons Where Standard/Benchmark Is Directly Addressed In Major Tool (Most In–Depth Coverage Listed First)
MAFS.2.MP.2.1	Reason abstractly and quantitatively.	Visual models are used to introduce new concepts or skills in Vmath. Teachers provide a cognitive think aloud or modeling of reasons and ideas used. Students are able to witness how the visual model provides a representation that has meaning throughout the lesson. The Center activity of each lesson provides students opportunities to make connections with manipulatives. Students explore different options and outcomes as they learn more about the concept through the use of manipulatives. For an example see: Module 7: Lesson 3: 341
MAFS.2.MP.3.1	Construct viable arguments and critique the reasoning of others.	Strong Vmath teachers use the components of Vmath to have students work in pairs to evaluate thinking. Many of the Center activities are designed so that students work with partners where results are then discussed. For an example see: Module 5: PL2: 215
MAFS.2.MP.4.1	Model with mathematics.	As the Vmath student begins to make connections between the concepts of math and the skills needed for success, problem solving is introduced strategically throughout each Vmath module. These problem-solving components help students begin to learn how to formulate a plan. For an example see: Module 3: Lesson 2: 116

Benchmark Code	Benchmark	Lessons Where Standard/Benchmark Is Directly Addressed In Major Tool (Most In–Depth Coverage Listed First)
MAFS.2.MP.5.1	Use appropriate tools strategically.	Vmath is built on the philosophy that students need help in learning how to use the manipulatives and tools introduced in core math programs. Therefore, Vmath directly teaches how to use the tool taught in the lesson. Once students become proficient in how to use the tools, they are better able to transfer the application. For an example see: Module 2: Lesson 4: 70
MAFS.2.MP.6.1	Attend to precision.	VmathLive activities provide students with opportunities to attend to precision and accuracy. In addition, Extra Practice can be used to reinforce skills. See: VmathLive.
MAFS.2.MP.7.1	Look for and make use of structure.	Each lesson is structured in the same manner: Get Started, How To, Try It Together, Work On Your Own, Problem-Solving/ Explain It, Check Up, and Center. This structure allows students to better understand the concepts and skills being taught. For an example see: Module 4: Lesson 3: 170–173
MAFS.2.MP.8.1	Look for and express regularity in repeated reasoning.	The Problem-Solving and Explain It activities allow students to regularly express reasoning, which helps them to better understand the skills and concepts. For an example see: Module 6: Lesson 4: 288
LAFS.2.SL.1.1	Participate in collaborative conversations with diverse partners about grade 2 topics and texts with peers and adults in small and larger groups.	Each lesson begins with a collaborative conversation reviewing preskills. These reviews provide opportunities to discuss grade 2 topics.

Benchmark Code	Benchmark	Lessons Where Standard/Benchmark Is Directly Addressed In Major Tool (Most In–Depth Coverage Listed First)
LAFS.2.SL.1.2	Recount or describe key ideas or details from a text read aloud or information presented orally or through other media.	Students have the opportunity to recount and discuss key instructions in each lesson in the program.
LAFS.2.SL.1.3	Ask and answer questions about what a speaker says in order to clarify comprehension, gather additional information, or deepen understanding of a topic or issue.	Students have the opportunity to ask and answer questions in each lesson of the program as they learn academic vocabulary, review preskills, and learn new content.
LAFS.2.W.1.2	Write informative/explanatory texts in which they introduce a topic, use facts and definitions to develop points, and provide a concluding statement or section.	This is beyond the scope of the program.
ELD.K12.ELL.MA.1	English language learners communicate information, ideas and concepts necessary for academic success in the content area of Mathematics.	The Vmath Live Animated Glossary provides support for this standard.
ELD.K12.ELL.SI.1	English language learners communicate for social and instructional purposes within the school setting.	Each lesson includes ELL differentiation and support to help students communicate for instructional purposes.

STANDARDS ALIGNMENT COURSE STANDARDS/BENCHMARKS (Form IM7)

SUBMISSION TITLE:	**Vmath, Level D**
GRADE LEVEL:	**3**
COURSE TITLE:	**Mathematics - Grade 3**
COURSE CODE:	**5012050**

Benchmark Code	Benchmark	Lessons Where Standard/Benchmark Is Directly Addressed In Major Tool (Most In–Depth Coverage Listed First)
MAFS.3.G.1.1	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). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.	Module 7: Lesson 11: 374–375 Module 7: Lesson 12: 376–379 Module 7: Lesson 13: 380–383
MAFS.3.G.1.2	Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole. *For example, partition a shape into 4 parts with equal area, and describe the area of each part as 1/4 of the area of the shape.*	Module 6: Lesson PL2: 280–283 Module 6: Lesson 1: 284–287 Module 6: Lesson 2: 288–289
MAFS.3.MD.1.1	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.	Module 7: Lesson 5: 350–353 Module 7: Lesson 6: 354–357
MAFS.3.MD.1.2	Measure and estimate liquid volumes and masses of objects using standard 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 units.	Module 7: Lesson 7: 358–361 Module 7: Lesson 8: 362–365

Benchmark Code	Benchmark	Lessons Where Standard/Benchmark Is Directly Addressed In Major Tool (Most In–Depth Coverage Listed First)
MAFS.3.MD.2.3	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. *For example, draw a bar graph in which each square in the bar graph might represent 5 pets.*	Module 7: Lesson 2: 338–341 Module 7: Lesson 3: 342–345 The following is a prerequisite for the standard: Module 7: Lesson 1: 334–337
MAFS.3.MD.2.4	Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units— whole numbers, halves, or quarters.	The following helps to address the standard: Module 7: Lesson 4: 366–369
MAFS.3.MD.3.5	Recognize area as an attribute of plane figures and understand concepts of area measurement. a. A square with side length 1 unit, called "a unit square," is said to have "one square unit" of area, and can be used to measure area. 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.	Module 7: Lesson 15: 388–391
MAFS.3.MD.3.6	Measure areas by counting unit squares (square cm, square m, square in, square ft, and improvised units).	Module 7: Lesson 15: 388–391

Benchmark Code	Benchmark	Lessons Where Standard/Benchmark Is Directly Addressed In Major Tool (Most In–Depth Coverage Listed First)
MAFS.3.MD.3.7	Relate area to the operations of multiplication and addition. 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. 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. 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 × b and a × c. Use area models to represent the distributive property in mathematical reasoning. 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.	Module 7: Lesson 15: 388–391

Benchmark Code	Benchmark	Lessons Where Standard/Benchmark Is Directly Addressed In Major Tool (Most In–Depth Coverage Listed First)
MAFS.3.MD.4.8	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.	Module 7: Lesson 14: 384–387
MAFS.3.NBT.1.1	Use place value understanding to round whole numbers to the nearest 10 or 100.	Module 2: Lesson 8: 86–87 Module 2: Lesson 9: 88–91
MAFS.3.NBT.1.2	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.	Module 3: Lesson PL1: 98–101 Module 3: Lesson PL2: 102–105 Module 3: Lesson 1: 106–109 Module 3: Lesson 2: 110–111 Module 3: Lesson 3: 112–115 Module 3: Lesson 4: 116–119 Module 3: Lesson 5: 120–123 Module 3: Lesson 6: 124–127 Module 3: Lesson 7: 128–131 Module 3: Lesson 8: 132–133 Module 3: Lesson 9: 134–137 Module 3: Lesson 10: 138–139 Module 3: Lesson 11: 140–143 Module 3: Lesson 12: 144–147 Module 3: Lesson 13: 148–151 Module 3: Lesson 14: 152–155 Module 3: Lesson 15: 156–159

Benchmark Code	Benchmark	Lessons Where Standard/Benchmark Is Directly Addressed In Major Tool (Most In–Depth Coverage Listed First)
MAFS.3.NBT.1.3	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.	Module 4: Lesson 13: 212–215 Module 4: Lesson 6: 188–191
MAFS.3.NF.1.1	Understand a fraction 1/b as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction a/b as the quantity formed by a parts of size 1/b.	Module 6: Lesson PL2: 280–283 Module 6: Lesson 1: 284–287 Module 6: Lesson 2: 288–289 Module 6: Lesson 3: 290–293 Module 6: Lesson 4: 294–297
MAFS.3.NF.1.2	Understand a fraction as a number on the number line; represent fractions on a number line diagram. a. Represent a 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 endpoint of the part based at 0 locates the number 1/b on the number line. 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.	Module 6: Lesson 8: 244–247

Benchmark Code	Benchmark	Lessons Where Standard/Benchmark Is Directly Addressed In Major Tool (Most In–Depth Coverage Listed First)
MAFS.3.NF.1.3	Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size. a. Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line. b. Recognize and generate simple equivalent fractions, e.g., 1/2 = 2/4, 4/6 = 2/3). Explain why the fractions are equivalent, e.g., by using a visual fraction model. c. Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers. *Examples: Express 3 in the form 3 = 3/1; recognize that 6/1 = 6; locate 4/4 and 1 at the same point of a number line diagram*. 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. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model.	Module 6: Lesson 5: 298 –299 Module 6: Lesson 6: 300 –303 Module 6: Lesson 7: 304 –307 Module 6: Lesson 8: 308–311

Benchmark Code	Benchmark	Lessons Where Standard/Benchmark Is Directly Addressed In Major Tool (Most In–Depth Coverage Listed First)
MAFS.3.OA.1.1	Interpret products of whole numbers, e.g., interpret 5 × 7 as the total number of objects in 5 groups of 7 objects each. For example, describe a context in which a total number of objects can be expressed as 5 × 7.	Module 4: Lesson PL1: 164–167 Module 4: Lesson PL2: 168–169 Module 4: Lesson 1: 171 Module 4: Lesson 2: 172–175 Module 4: Lesson 3: 176–179 Module 4: Lesson 3: 180–183 Module 4: Lesson 5: 184–187 Module 4: Lesson 6: 188–191 Module 4: Lesson 7: 192–195 Module 4: Lesson 8: 196–199 Module 4: Lesson 9: 200–203 Module 4: Lesson 10: 204–205 Module 4: Lesson 11: 206–209 Module 4: Lesson 12: 211 Module 4: Lesson 13: 212–215 Module 4: Lesson 14: 216–219 Module 4: Lesson 15: 220–223

Benchmark Code	Benchmark	Lessons Where Standard/Benchmark Is Directly Addressed In Major Tool (Most In–Depth Coverage Listed First)
MAFS.3.OA.1.2	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. *For example, describe a context in which a number of shares or a number of groups can be expressed as 56 ÷ 8.*	Module 5: Lesson PL1: 228–231 Module 5: Lesson PL2: 232–233 Module 5: Lesson 1: 235 Module 5: Lesson 2: 236–239 Module 5: Lesson 3: 240–243 Module 5: Lesson 4: 244–247 Module 5: Lesson 5: 248–251 Module 5: Lesson 7: 256–259 Module 5: Lesson 8: 260–263 Module 5: Lesson 9: 264–267 Module 5: Lesson 10: 268–271

Benchmark Code	Benchmark	Lessons Where Standard/Benchmark Is Directly Addressed In Major Tool (Most In–Depth Coverage Listed First)
MAFS.3.OA.1.3	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.	Module 4: Lesson PL1: 164–167 Module 4: Lesson PL2: 168–169 Module 4: Lesson 1: 171 Module 4: Lesson 2: 172–175 Module 4: Lesson 3: 176–179 Module 4: Lesson 3: 180–183 Module 4: Lesson 5: 184–187 Module 4: Lesson 6: 188–191 Module 4: Lesson 7: 192–195 Module 4: Lesson 8: 196–199 Module 4: Lesson 9: 200–203 Module 4: Lesson 10: 204–205 Module 4: Lesson 11: 206–209 Module 4: Lesson 12: 211 Module 4: Lesson 13: 212–215 Module 4: Lesson 14: 216–219 Module 4: Lesson 15: 220–223 Module 5: Lesson PL1: 228–231 Module 5: Lesson PL2: 232–233 Module 5: Lesson 1: 235 Module 5: Lesson 2: 236–239 Module 5: Lesson 3: 240–243 Module 5: Lesson 4: 244–247 Module 5: Lesson 5: 248–251 Module 5: Lesson 7: 256–259 (continued on next page)

Benchmark Code	Benchmark	Lessons Where Standard/Benchmark Is Directly Addressed In Major Tool (Most In–Depth Coverage Listed First)
MAFS.3.OA.1.3	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.	(continued from previous page) Module 5: Lesson 8: 260–263 Module 5: Lesson 9: 264–267 Module 5: Lesson 10: 268–271
MAFS.3.OA.1.4	Determine the unknown whole number in a multiplication or division equation relating three whole numbers. *For example, determine the unknown number that makes the equation true in each of the equations* $8 \times ? = 48$, $5 = [] \div 3$, $6 \times 6 = ?$.	Module 5: Lesson 8: 260–263 Module 5: Lesson 9: 264–267
MAFS.3.OA.2.5	Apply properties of operations as strategies to multiply and divide. *Examples: If* $6 \times 4 = 24$ *is known, then* $4 \times 6 = 24$ *is also known. (Commutative property of multiplication.)* $3 \times 5 \times 2$ *can be found by* $3 \times 5 = 15$, *then* $15 \times 2 = 30$, *or by* $5 \times 2 = 10$, *then* $3 \times 10 = 30$. *(Associative property of multiplication.) Knowing that* $8 \times 5 = 40$ *and* $8 \times 2 = 16$, *one can find* 8×7 *as* $8 \times (5 + 2) = (8 \times 5) + (8 \times 2) = 40 + 16 = 56$. *(Distributive property.)*	Module 4: Lesson 11: 206–210 Module 4: Lesson 12: 211

Benchmark Code	Benchmark	Lessons Where Standard/Benchmark Is Directly Addressed In Major Tool (Most In–Depth Coverage Listed First)
MAFS.3.OA.2.6	Understand division as an unknown-factor problem. *For example, find 32 ÷ 8 by finding the number that makes 32 when multiplied by 8.*	Module 5: Lesson PL1: 228–231 Module 5: Lesson PL2: 232–233 Module 5: Lesson 1: 235 Module 5: Lesson 2: 236–239 Module 5: Lesson 3: 240–243 Module 5: Lesson 4: 244–247 Module 5: Lesson 5: 248–251 Module 5: Lesson 7: 256–259 Module 5: Lesson 8: 260–263
MAFS.3.OA.3.7	Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that $8 \times 5 = 40$, one knows $40 \div 5 = 8$) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.	Module 4: Lesson PL1: 164–167 Module 4: Lesson PL2: 168–169 Module 4: Lesson 1: 171 Module 4: Lesson 2: 172–175 Module 4: Lesson 3: 176–179 Module 4: Lesson 3: 180–183 Module 4: Lesson 5: 184–187 Module 4: Lesson 6: 188–191 Module 4: Lesson 7: 192–195 Module 4: Lesson 8: 196–199 Module 4: Lesson 9: 200–203 Module 4: Lesson 10: 204–205 Module 4: Lesson 11: 206–209 Module 4: Lesson 12: 211 Module 4: Lesson 13: 212–215 Module 4: Lesson 14: 216–219 (continued on next page)

Benchmark Code	Benchmark	Lessons Where Standard/Benchmark Is Directly Addressed In Major Tool (Most In–Depth Coverage Listed First)
MAFS.3.OA.3.7	Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that $8 \times 5 = 40$, one knows $40 \div 5 = 8$) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.	(continued from previous page) Module 4: Lesson 15: 220–223 Module 5: Lesson PL1: 228–231 Module 5: Lesson PL2: 232–233 Module 5: Lesson 1: 235 Module 5: Lesson 2: 236–239 Module 5: Lesson 3: 240–243 Module 5: Lesson 4: 244–247 Module 5: Lesson 5: 248–251 Module 5: Lesson 7: 256–259 Module 5: Lesson 8: 260–263 Module 5: Lesson 9: 264–267 Module 5: Lesson 10: 268–271
MAFS.3.OA.4.8	Solve two-step word problems using the four operations. 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.	Module 3: Lesson 15: 156–159 Module 5: Lesson 9: 264–267 Module 5: Lesson 10: 268–271

Benchmark Code	Benchmark	Lessons Where Standard/Benchmark Is Directly Addressed In Major Tool (Most In–Depth Coverage Listed First)
MAFS.3.OA.4.9	Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. *For example, observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends.*	Module 1: Lesson PL1: 2–5 Module 4: Lesson PL1: 164–167 Module 4: Lesson PL2: 168–169 Module 4: Lesson 1: 171 Module 4: Lesson 2: 172–175 Module 4: Lesson 3: 176–179 Module 4: Lesson 3: 180–183 Module 4: Lesson 5: 184–187 Module 4: Lesson 6: 188–191 Module 4: Lesson 7: 192–195 Module 4: Lesson 8: 196–199 Module 4: Lesson 9: 200–203 Module 5: Lesson 6: 252–255 Module 5: Lesson 7: 256–259
MAFS.K12.MP.1.1	Make sense of problems and persevere in solving them.	Students learn the procedures of a strategy and are given tools to help them remember the procedures as they use them to build conceptual understanding. Struggling math students need reinforcement as they learn to remember these procedures. The How To box provides students with two different examples so they can repeat the procedure.

Benchmark Code	Benchmark	Lessons Where Standard/Benchmark Is Directly Addressed In Major Tool (Most In–Depth Coverage Listed First)
MAFS.K12.MP.2.1	Reason abstractly and quantitatively.	Visual models are used to introduce new concepts or skills in Vmath. Teachers provide a cognitive think aloud or modeling of reasons and ideas used. Students are able to witness how the visual model provides a representation that has meaning throughout the lesson. Hands On and Gizmo Lessons provide students opportunities to make connections with manipulatives. Students explore different options and outcomes as they learn more about the concept through the use of manipulatives.
MAFS.K12.MP.3.1	Construct viable arguments and critique the reasoning of others.	Strong Vmath teachers use the components of Vmath to have students work in pairs to evaluate thinking. Write Math, Explain It, and Algebraic Thinking are perfect tools to help students begin to construct arguments and work together to compare. Vmath teacher's use Critical Thinking Questions to helps students think more deeply about lesson skills and concepts. Critical Thinking questions focus on thinking skills such as deductive reasoning, decision making, and identifying and explaining errors.
MAFS.K12.MP.4.1	Model with mathematics.	As the Vmath student begins to make connections between the concepts of math and the skills needed for success, problem solving is introduced strategically throughout each Vmath module. These problem solving components helps students begin to learn how to formulate a plan.

Benchmark Code	Benchmark	Lessons Where Standard/Benchmark Is Directly Addressed In Major Tool (Most In–Depth Coverage Listed First)
MAFS.K12.MP.5.1	Use appropriate tools strategically.	Vmath is built on the philosophy that students need help in learning how to use the manipulatives and tools introduced in core math programs. Therefore, Vmath directly teaches how to use the tool taught in the lesson. Once students become proficient in how to use the tools, they are better able to transfer the application.
MAFS.K12.MP.6.1	Attend to precision.	Math Flash lessons and VmathLive provide students with practice to attend to precision and accuracy. In addition, each Vmath lesson also includes an Extra Practice component that can be used.
MAFS.K12.MP.7.1	Look for and make use of structure.	Vmath Hands-On lessons and Gizmos lessons integrated at point of use help teachers present important math concepts using either common manipulatives or Gizmos, online virtual manipulatives developed by Explore Learning. Additionally, in the daily Vmath lessons, the Build the Concept box uses visual models and pictorial representations to help students develop conceptual understanding.
MAFS.K12.MP.8.1	Look for and express regularity in repeated reasoning.	Vmath teacher's use Critical Thinking Questions to helps students think more deeply about lesson skills and concepts. Critical Thinking questions focus on thinking skills such as deductive reasoning, decision making, and identifying and explaining errors.

Benchmark Code	Benchmark	Lessons Where Standard/Benchmark Is Directly Addressed In Major Tool (Most In–Depth Coverage Listed First)
LAFS.3.SL.1.1	Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 3 topics and texts, building on others' ideas and expressing their own clearly.	Each lesson begins with a collaborative conversation reviewing preskills. These reviews provide opportunities to discuss grade 3 topics.
LAFS.3.SL.1.2	Determine the main ideas and supporting details of a text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally.	Students have the opportunity to recount and discuss key instructions in each lessons in the program.
LAFS.3.SL.1.3	Ask and answer questions about information from a speaker, offering appropriate elaboration and detail.	Students have the opportunity to ask and answer questions in each lesson of the program as they learn academic vocabulary, review preschools, and learn new content.
LAFS.3.W.1.2	Write informative/explanatory texts to examine a topic and convey ideas and information clearly.	This is beyond the scope of the program.
ELD.K12.ELL.MA.1	English language learners communicate information, ideas and concepts necessary for academic success in the content area of Mathematics.	The Vmath Live Animated Glossary provides support for this standard.
ELD.K12.ELL.SI.1	English language learners communicate for social and instructional purposes within the school setting.	Each lesson includes ELL differentiation and support to help students communicate for instructional purposes.

STANDARDS ALIGNMENT COURSE STANDARDS/BENCHMARKS (Form IM7)

SUBMISSION TITLE:	**Vmath, Level E**
GRADE LEVEL:	**4**
COURSE TITLE:	**Mathematics - Grade 4**
COURSE CODE:	**5012060**

Benchmark Code	Benchmark	Lessons Where Standard/Benchmark Is Directly Addressed In Major Tool (Most In–Depth Coverage Listed First)
MAFS.4.G.1.1:	Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.	Module 6: Lesson PL1: 256–259 Module 6: Lesson PL2: 260–263 Module 6: Lesson 2: 266–269 Module 6: Lesson 3: 270–273 Module 6: Lesson 4: 274–277 Module 6: Lesson 6: 282–285
MAFS.4.G.1.2:	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.	Module 6: Lesson 2: 266–269 Module 6: Lesson 3: 270–273 Module 6: Lesson 4: 274–277 Module 6: Lesson 6: 282–285
MAFS.4.G.1.3:	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.	Module 6: Lesson 9: 294–295 Module 6: Lesson 10: 296–299

Benchmark Code	Benchmark	Lessons Where Standard/Benchmark Is Directly Addressed In Major Tool (Most In–Depth Coverage Listed First)
MAFS.4.MD.1.1:	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. *For example, know that 1 ft is 12 times as long as 1 in. Express the length of a 4 ft snake as 48 in. Generate a conversion table for feet and inches listing the number pairs (1, 12), (2, 24), (3, 36), . . .*	Module 7: Lesson 4: 326–329 Module 7: Lesson 5: 330–333 Module 7: Lesson 6: 334–337 Module 7: Lesson 1: 314–317
MAFS.4.MD.1.2:	Use the four operations to solve word problems[1] involving distances, intervals of time, and money, including problems involving simple fractions or decimals[2]. Represent fractional quantities of distance and intervals of time using linear models. ([1]See glossary Table 1 and Table 2) ([2]Computational fluency with fractions and decimals is not the goal for students at this grade level.)	Module 5: Lesson 8: 224–227 Module 7: Lesson PL1: 306–309 Module 7: Lesson 1: 314–317 Module 7: Lesson 2: 318–321 Module 7: Lesson 3: 322–325 Module 7: Lesson 6: 334–337 Module 7: Lesson 7: 338–341 Module 7: Lesson 8: 342–343 Module 7: Lesson 15: 366–369
MAFS.4.MD.1.3:	Apply the area and perimeter formulas for rectangles in real world and mathematical problems. *For example, find the width of a rectangular room given the area of the flooring and the length, by viewing the area formula as a multiplication equation with an unknown factor.*	Module 7: Lesson PL1: 306–309 Module 7: Lesson PL2: 310–313 Module 7: Lesson 8: 342–343 Module 7: Lesson 9: 344–347 Module 7: Lesson 15: 366–369

Benchmark Code	Benchmark	Lessons Where Standard/Benchmark Is Directly Addressed In Major Tool (Most In–Depth Coverage Listed First)
MAFS.4.MD.2.4:	Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Solve problems involving addition and subtraction of fractions by using information presented in line plots. *For example, from a line plot find and interpret the difference in length between the longest and shortest specimens in an insect collection.*	Module 7: Lesson 14: 365 Module 7: Lesson 12: 356–359
MAFS.4.MD.3.5:	Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement: 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. b. An angle that turns through *n* one-degree angles is said to have an angle measure of *n* degrees.	Module 6: Lesson PL2: 260–263 Module 6: Lesson 1: 265 Module 6: Lesson 7: 286–289
MAFS.4.MD.3.6:	Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.	Module 6: Lesson 1: 265

Benchmark Code	Benchmark	Lessons Where Standard/Benchmark Is Directly Addressed In Major Tool (Most In–Depth Coverage Listed First)
MAFS.4.MD.3.7:	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.	Module 6: Lesson 1: 265 Module 6: Lesson 6: 282–285 Module 6: Lesson 8: 326–329
MAFS.4.NBT.1.1:	Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right. *For example, recognize that 700 ÷ 70 = 10 by applying concepts of place value and division.*	Module 1: Lesson 1: 2–5
MAFS.4.NBT.1.2:	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 < symbols to record the results of comparisons.	Module 1: Lesson 1: 2–5 Module 1: Lesson 2: 6–9 Module 1: Lesson 3: 10–13 Module 1: Lesson 4: 14–17 Module 1: Lesson 5: 18–19 Module 1: Lesson 7: 22–25
MAFS.4.NBT.1.3:	Use place value understanding to round multi-digit whole numbers to any place.	Module 1: Lesson 9: 30–31 Module 1: Lesson 10: 32–35

Benchmark Code	Benchmark	Lessons Where Standard/Benchmark Is Directly Addressed In Major Tool (Most In–Depth Coverage Listed First)
MAFS.4.NBT.2.4:	Fluently add and subtract multi-digit whole numbers using the standard algorithm.	Module 2: Lesson PL1: 41 Module 2: Lesson PL2: 42–45 Module 2: Lesson 1: 46–47 Module 2: Lesson 2: 48–51 Module 2: Lesson 3: 52–55 Module 2: Lesson 4: 56–57 Module 2: Lesson 5: 58–59 Module 2: Lesson 6: 60–63 Module 2: Lesson 7: 64–67 Module 2: Lesson 8: 68–71 Module 2: Lesson 9: 72–75 Module 2: Lesson 10: 76–79
MAFS.4.NBT.2.5:	Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.	Module 3: Lesson PL1: 84–87 Module 3: Lesson PL2: 88–91 Module 3: Lesson 1: 92–95 Module 3: Lesson 2: 96–99 Module 3: Lesson 3: 100–103 Module 3: Lesson 4: 104–107 Module 3: Lesson 5: 108–111 Module 3: Lesson 6: 112–115 Module 3: Lesson 7: 116–119 Module 3: Lesson 9: 124–127 Module 3: Lesson 14: 138–141 Module 3: Lesson 15: 142–145

Benchmark Code	Benchmark	Lessons Where Standard/Benchmark Is Directly Addressed In Major Tool (Most In–Depth Coverage Listed First)
MAFS.4.NBT.2.6:	Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.	Module 3: Lesson 8: 120–123 Module 3: Lesson 9: 124–127 Module 3: Lesson 10: 128–129 Module 3: Lesson 11: 130–131 Module 3: Lesson 12: 132–133 Module 3: Lesson 13: 134–137 Module 3: Lesson 14: 138–141 Module 3: Lesson 15: 142–145
MAFS.4.NF.1.1:	Explain why a fraction a/b is equivalent to a fraction $(n \times a)/(n \times b)$ by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions.	Module 4: Lesson 3: 166–169 Module 4: Lesson 4: 170–173 Module 4: Lesson 5: 174–177 Module 4: Lesson 6: 178–179 Module 4: Lesson 7: 180–183 Module 4: Lesson 8: 184–185
MAFS.4.NF.1.2:	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 1/2. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model.	Module 4: Lesson 9: 186–187 Module 4: Lesson 10: 188–189

Benchmark Code	Benchmark	Lessons Where Standard/Benchmark Is Directly Addressed In Major Tool (Most In–Depth Coverage Listed First)
MAFS.4.NF.2.3:	Understand a fraction a/b with a > 1 as a sum of fractions 1/b. a. Understand addition and subtraction of fractions as joining and separating parts referring to the same whole. 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, e.g., by using a visual fraction model. *Examples: 3/8 = 1/8 + 1/8 + 1/8 ; 3/8 = 1/8 + 2/8 ; 2 1/8 = 1 + 1 + 1/8 = 8/8 + 8/8 + 1/8.* 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. d. Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., by using visual fraction models and equations to represent the problem.	Module 4: Lesson 5: 174–177 Module 5: Lesson 9: 228–229 Module 5: Lesson 10: 266–269 Module 5: Lesson 11: 234–235 Module 5: Lesson 12: 236–239 Module 5: Lesson 15: 244–247

Benchmark Code	Benchmark	Lessons Where Standard/Benchmark Is Directly Addressed In Major Tool (Most In–Depth Coverage Listed First)
MAFS.4.NF.2.4:	Apply and extend previous understandings of multiplication to multiply a fraction by a whole number. a. Understand a fraction a/b as a multiple of 1/b. *For example, use a visual fraction model to represent 5/4 as the product 5 × (1/4), recording the conclusion by the equation 5/4 = 5 × (1/4).* 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. *For example, use a visual fraction model to express 3 × (2/5) as 6 × (1/5), recognizing this product as 6/5. (In general, n × (a/b) = (n × a)/b.)* c. Solve word problems involving multiplication of a fraction by a whole number, e.g., by using visual fraction models and equations to represent the problem. *For example, if each person at a party will eat 3/8 of a pound of roast beef, and there will be 5 people at the party, how many pounds of roast beef will be needed? Between what two whole numbers does your answer lie?*	Module 5: Lesson 15: 248–249
MAFS.4.NF.3.5:	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. *For example, express 3/10 as 30/100, and add 3/10 + 4/100 = 34/100.*	The following help to address the standard: Module 5: Lesson 13: 240–243 Module 5: Lesson PL2: 195

Benchmark Code	Benchmark	Lessons Where Standard/Benchmark Is Directly Addressed In Major Tool (Most In–Depth Coverage Listed First)
MAFS.4.NF.3.6:	Use decimal notation for fractions with denominators 10 or 100. *For example, rewrite 0.62 as 62/100; describe a length as 0.62 meters; locate 0.62 on a number line diagram.*	Module 5: Lesson 13: 240–243 Module 5: Lesson 1: 196–199
MAFS.4.NF.3.7:	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 <, and justify the conclusions, e.g., by using a visual model.	Module 5: Lesson 3: 204–207
MAFS.4.OA.1.1:	Interpret a multiplication equation as a comparison, e.g., interpret $35 = 5 \times 7$ 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.	Module 3: Lesson PL1: 84–87 Module 3: Lesson PL2: 88–91 Module 3: Lesson 1: 92–95

Benchmark Code	Benchmark	Lessons Where Standard/Benchmark Is Directly Addressed In Major Tool (Most In–Depth Coverage Listed First)
MAFS.4.OA.1.2:	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.	Module 3: Lesson PL1: 84–87 Module 3: Lesson PL2: 88–91 Module 3: Lesson 1: 92–95 Module 3: Lesson 2: 96–99 Module 3: Lesson 3: 100–103 Module 3: Lesson 4: 104–107 Module 3: Lesson 5: 108–111 Module 3: Lesson 6: 112–115 Module 3: Lesson 7: 116–119 Module 3: Lesson 8: 120–123 Module 3: Lesson 9: 124–127 Module 3: Lesson 10: 128–129 Module 3: Lesson 11: 130–131 Module 3: Lesson 12: 132–133 Module 3: Lesson 13: 134–137 Module 3: Lesson 14: 138–141 Module 3: Lesson 15: 142–145 Module 4: Lesson 1: 158–161

Benchmark Code	Benchmark	Lessons Where Standard/Benchmark Is Directly Addressed In Major Tool (Most In–Depth Coverage Listed First)
MAFS.4.OA.1.3:	Solve multistep 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.	Module 2: Lesson 8: 68–71 Module 3: Lesson 14: 138–141 Module 3: Lesson 15: 142–145 Module 5: Lesson 14: 244–247 Module 7: Lesson 10: 348–351 Module 1: Lesson 6: 20–21 Module 1: Lesson 9: 30–31 Module 1: Lesson 10: 32–35 Module 2: Lesson 9: 72–75
MAFS.4.OA.1.a:	Determine whether an equation is true or false by using comparative relational thinking. *For example, without adding 60 and 24, determine whether the equation 60 + 24 = 57 + 27 is true or false.*	The following help to address the standard: Module 2: Lesson PL2: 42–45 Module 2: Lesson 8: 68–71 Module 3: Lesson 14: 138–141
MAFS.4.OA.1.b:	Determine the unknown whole number in an equation relating four whole numbers using comparative relational thinking. *For example, solve 76 + 9 = n + 5 for n by arguing that nine is four more than five, so the unknown number must be four greater than 76.*	The following help to address the standard: Module 2: Lesson PL2: 42–45 Module 2: Lesson 8: 68–71 Module 3: Lesson 14: 138–141

Benchmark Code	Benchmark	Lessons Where Standard/Benchmark Is Directly Addressed In Major Tool (Most In–Depth Coverage Listed First)
MAFS.4.OA.2.4:	Investigate factors and multiples. a. Find all factor pairs for a whole number in the range 1–100. b. 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. c. Determine whether a given whole number in the range 1–100 is prime or composite.	Module 4: Lesson PL1: 150–153 Module 4: Lesson PL2: 154–157 Module 4: Lesson 1: 158–161 Module 4: Lesson 2: 162–165
MAFS.4.OA.3.5:	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. *For example, given the rule "Add 3" and the starting number 1, generate terms in the resulting sequence and observe that the terms appear to alternate between odd and even numbers. Explain informally why the numbers will continue to alternate in this way.*	Module 4: Lesson 1: 158–161 Module 7: Lesson 11: 352–355
MAFS.K12.MP.1.1:	Make sense of problems and persevere in solving them.	Students learn the procedures of a strategy and are given tools to help them remember the procedures as they use them to build conceptual understanding. Struggling math students need reinforcement as they learn to remember these procedures. The How To box provides students with two different examples so they can repeat the procedure. For an example see: Module 1: Lesson 3: 11

Benchmark Code	Benchmark	Lessons Where Standard/Benchmark Is Directly Addressed In Major Tool (Most In–Depth Coverage Listed First)
MAFS.K12.MP.2.1:	Reason abstractly and quantitatively.	Visual models are used to introduce new concepts or skills in Vmath. Teachers provide a cognitive think aloud or modeling of reasons and ideas used. Students are able to witness how the visual model provides a representation that has meaning throughout the lesson. Hands-On and Gizmo Lessons provide students opportunities to make connections with manipulatives. Students explore different options and outcomes as they learn more about the concept through the use of manipulatives. For an example see: Module 3: Lesson 12: 132–133
MAFS.K12.MP.3.1:	Construct viable arguments and critique the reasoning of others.	Strong Vmath teachers use the components of Vmath to have students work in pairs to evaluate thinking. Write Math, Explain It, and Algebraic Thinking are perfect tools to help students begin to construct arguments and work together to compare. Vmath teachers use Critical Thinking questions to help students think more deeply about lesson skills and concepts. Critical Thinking questions focus on thinking skills such as deductive reasoning, decision making, and identifying and explaining errors. For an example see: Module 2: Lesson 2: 51
MAFS.K12.MP.4.1:	Model with mathematics.	As the Vmath student begins to make connections between the concepts of math and the skills needed for success, problem solving is introduced strategically throughout each Vmath module. These problem-solving components help students begin to learn how to formulate a plan. For an example see: Module 4: PL2: 156

Benchmark Code	Benchmark	Lessons Where Standard/Benchmark Is Directly Addressed In Major Tool (Most In–Depth Coverage Listed First)
MAFS.K12.MP.5.1:	Use appropriate tools strategically.	Vmath is built on the philosophy that students need help in learning how to use the manipulatives and tools introduced in core math programs. Therefore, Vmath directly teaches how to use the tool taught in the lesson. Once students become proficient in how to use the tools, they are better able to transfer the application. For an example see: Module 6: Lesson 1: 265
MAFS.K12.MP.6.1:	Attend to precision.	Math Flash lessons and VmathLive provide students with practice to attend to precision and accuracy. In addition, each Vmath lesson also includes an Extra Practice component that can be used. For an example see: Module 2: PL1: 41
MAFS.K12.MP.7.1:	Look for and make use of structure.	Vmath Hands-On lessons and Gizmos lessons integrated at point of use help teachers present important math concepts using either common manipulatives or Gizmos, online virtual manipulatives developed by Explore Learning. Additionally, in the daily Vmath lessons, the Build the Concept box uses visual models and pictorial representations to help students develop conceptual understanding. For an example see: Module 6: Lesson 7: 286
MAFS.K12.MP.8.1:	Look for and express regularity in repeated reasoning.	Vmath teachers use Critical Thinking questions to help students think more deeply about lesson skills and concepts. Critical Thinking questions focus on thinking skills such as deductive reasoning, decision making, and identifying and explaining errors. For an example see: Module 1: Lesson 4: 17

Benchmark Code	Benchmark	Lessons Where Standard/Benchmark Is Directly Addressed In Major Tool (Most In–Depth Coverage Listed First)
LAFS.4.SL.1.1:	Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 4 topics and texts, building on others' ideas and expressing their own clearly.	Each lesson begins with a collaborative conversation reviewing preskills. These reviews provide opportunities to discuss grade 4 topics.
LAFS.4.SL.1.2:	Paraphrase portions of a text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally.	Students have the opportunity to recount and discuss key instructions in each lesson in the program.
LAFS.4.SL.1.3:	Identify the reasons and evidence a speaker provides to support particular points.	Students have the opportunity to ask and answer questions in each lesson of the program as they learn academic vocabulary, review preskills, and learn new content.
LAFS.4.W.1.2:	Write informative/explanatory texts to examine a topic and convey ideas and information clearly.	This is beyond the scope of the program.
ELD.K12.ELL.MA.1:	English language learners communicate information, ideas and concepts necessary for academic success in the content area of Mathematics.	The Vmath Live Animated Glossary provides support for this standard.
ELD.K12.ELL.SI.1:	English language learners communicate for social and instructional purposes within the school setting.	Each lesson includes ELL differentiation and support to help students communicate for instructional purposes.

STANDARDS ALIGNMENT COURSE STANDARDS/BENCHMARKS (Form IM7)

SUBMISSION TITLE:	**Vmath, Level F**
GRADE LEVEL:	**5**
COURSE TITLE:	**Mathematics - Grade 5**
COURSE CODE:	**5012070**

Benchmark Code	Benchmark	Lessons Where Standard/Benchmark Is Directly Addressed In Major Tool (Most In–Depth Coverage Listed First)
MAFS.5.G.1.1:	Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g., x-axis and x-coordinate, y-axis and y-coordinate).	Module 7: Lesson 9: 340–343
MAFS.5.G.1.2:	Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.	Module 7: Lesson 9: 340–343 Module 7: Lesson 10: 344–345
MAFS.5.G.2.3:	Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. *For example, all rectangles have four right angles and squares are rectangles, so all squares have four right angles.*	Module 7: Lesson PL1: 306–307 Module 7: Lesson 1: 312–315 Module 7: Lesson 2: 316–319

Benchmark Code	Benchmark	Lessons Where Standard/Benchmark Is Directly Addressed In Major Tool (Most In–Depth Coverage Listed First)
MAFS.5.G.2.4:	Classify and organize two-dimensional figures into Venn diagrams based on the attributes of the figures.	The following helps address this standard: Module 7: Lesson 2: 316–319
MAFS.5.MD.1.1:	Convert among different-sized standard measurement units (i.e., km, m, cm; kg, g; lb, oz.; l, ml; hr, min, sec) within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.	Module 7: Lesson 3: 320–323 Module 7: Lesson 4: 324–327
MAFS.5.MD.2.2:	Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Use operations on fractions for this grade to solve problems involving information presented in line plots. *For example, given different measurements of liquid in identical beakers, find the amount of liquid each beaker would contain if the total amount in all the beakers were redistributed equally.*	Module 6: Lesson 9: 297 Module 6: Lesson 10: 298–301

Benchmark Code	Benchmark	Lessons Where Standard/Benchmark Is Directly Addressed In Major Tool (Most In–Depth Coverage Listed First)
MAFS.5.MD.3.3:	Recognize volume as an attribute of solid figures and understand concepts of volume measurement. a. A cube with side length 1 unit, called a "unit cube," is said to have "one cubic unit" of volume, and can be used to measure volume. b. A solid figure which can be packed without gaps or overlaps using n unit cubes is said to have a volume of n cubic units.	Module 7: Lesson 5: 328–329 Module 7: Lesson 6: 330–333 Module 7: Lesson 7: 334–335
MAFS.5.MD.3.4:	Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units.	Module 7: Lesson 5: 328–329 Module 7: Lesson 6: 330–333 Module 7: Lesson 7: 334–335

Benchmark Code	Benchmark	Lessons Where Standard/Benchmark Is Directly Addressed In Major Tool (Most In–Depth Coverage Listed First)
MAFS.5.MD.3.5:	Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume. a. Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base. Represent threefold whole-number products as volumes, e.g., to represent the associative property of multiplication. b. Apply the formulas $V = l \times w \times h$ and $V = B \times h$ for rectangular prisms to find volumes of right rectangular prisms with whole-number edge lengths in the context of solving real world and mathematical problems. c. Recognize volume as additive. Find volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of the non-overlapping parts, applying this technique to solve real world problems.	Module 7: Lesson 5: 328–329 Module 7: Lesson 6: 330–333 Module 7: Lesson 7: 334–335
MAFS.5.NBT.1.1:	Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left.	Module 1: Lesson 1: 2–5 Module 1: Lesson 2: 6–9

Benchmark Code	Benchmark	Lessons Where Standard/Benchmark Is Directly Addressed In Major Tool (Most In–Depth Coverage Listed First)
MAFS.5.NBT.1.2:	Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10.	Module 3: Lesson 6: 110–113
MAFS.5.NBT.1.3:	Read, write, and compare decimals to thousandths. a. Read and write decimals to thousandths using base-ten numerals, number names, and expanded form, e.g., $347.392 = 3 \times 100 + 4 \times 10 + 7 \times 1 + 3 \times (1/10) + 9 \times (1/100) + 2 \times (1/1000)$. b. Compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.	Module 1: Lesson 8: 30–33 Module 2: Lesson 3: 56–59 Module 2: Lesson 4: 60–63 Module 2: Lesson 5: 64–67 Module 2: Lesson 6: 68–69 Module 2: Lesson 7: 70–71 Module 2: Lesson 8: 72–75
MAFS.5.NBT.1.4:	Use place value understanding to round decimals to any place.	Module 2: Lesson 9: 76–80 Module 2: Lesson 10: 81 Module 3: Lesson 13: 134–138 Module 3: Lesson 14: 139 Module 3: Lesson 15: 140–143
MAFS.5.NBT.2.5:	Fluently multiply multi-digit whole numbers using the standard algorithm.	Module 3: Lesson 6: 110–113 Module 3: Lesson 7: 114–117

Benchmark Code	Benchmark	Lessons Where Standard/Benchmark Is Directly Addressed In Major Tool (Most In–Depth Coverage Listed First)
MAFS.5.NBT.2.6:	Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.	Module 3: Lesson 10: 124–127
MAFS.5.NBT.2.7:	Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.	Module 3: Lesson 1: 92–95 Module 3: Lesson 2: 96–99 Module 3: Lesson 3: 100–101 Module 3: Lesson 4: 102–105 Module 3: Lesson 5: 106–109 Module 3: Lesson 8: 118–119 Module 3: Lesson 9: 156–159 Module 3: Lesson 11: 128–129 Module 3: Lesson 12: 130–133 Module 3: Lesson 13: 134–138 Module 3: Lesson 14: 139 Module 3: Lesson 15: 140–143

Benchmark Code	Benchmark	Lessons Where Standard/Benchmark Is Directly Addressed In Major Tool (Most In–Depth Coverage Listed First)
MAFS.5.NF.1.1:	Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. *For example, 2/3 + 5/4 = 8/12 + 15/12 = 23/12. (In general, a/b + c/d = (ad + bc)/bd.)*	Module 4: Lesson 3: 166–169 Module 4: Lesson 4: 170–173 Module 4: Lesson 5: 174–175 Module 4: Lesson 6: 176–179 Module 4: Lesson 7: 180–183 Module 4: Lesson 8: 184–187 Module 4: Lesson 9: 188–192 Module 4: Lesson 1: 158–161 Module 4: Lesson 2: 162–165
MAFS.5.NF.1.2:	Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. *For example, recognize an incorrect result 2/5 + 1/2 = 3/7, by observing that 3/7 < 1/2.*	Module 4: Lesson 3: 166–169 Module 4: Lesson 4: 170–173 Module 4: Lesson 5: 174–175 Module 4: Lesson 6: 176–179 Module 4: Lesson 7: 180–183 Module 4: Lesson 8: 184–187 Module 4: Lesson 9: 188–192 Module 4: Lesson 1: 158–161 Module 4: Lesson 2: 162–165

Benchmark Code	Benchmark	Lessons Where Standard/Benchmark Is Directly Addressed In Major Tool (Most In–Depth Coverage Listed First)
MAFS.5.NF.2.3:	Interpret a fraction as division of the numerator by the denominator (a/b = a ÷ b). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem. *For example, interpret 3/4 as the result of dividing 3 by 4, noting that 3/4 multiplied by 4 equals 3, and that when 3 wholes are shared equally among 4 people each person has a share of size 3/4. If 9 people want to share a 50-pound sack of rice equally by weight, how many pounds of rice should each person get? Between what two whole numbers does your answer lie?*	Module 4: Lesson 12: 199 Module 4: Lesson 13: 200–203 Module 4: Lesson 14: 204–207

Benchmark Code	Benchmark	Lessons Where Standard/Benchmark Is Directly Addressed In Major Tool (Most In–Depth Coverage Listed First)
MAFS.5.NF.2.4:	Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction. a. Interpret the product *(a/b)* × *q* as a parts of a partition of *q* into *b* equal parts; equivalently, as the result of a sequence of operations *a* × *q* ÷ *b*. *For example, use a visual fraction model to show (2/3) × 4 = 8/3, and create a story context for this equation. Do the same with (2/3) × (4/5) = 8/15. (In general, (a/b) × (c/d) = ac/bd.)* b. Find the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas.	Module 4: Lesson 10: 193 Module 4: Lesson 11: 194–198 Module 4: Lesson 15: 209

Benchmark Code	Benchmark	Lessons Where Standard/Benchmark Is Directly Addressed In Major Tool (Most In–Depth Coverage Listed First)
MAFS.5.NF.2.5:	Interpret multiplication as scaling (resizing), by: a. Comparing the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication. b. Explaining why multiplying a given number by a fraction greater than 1 results in a product greater than the given number (recognizing multiplication by whole numbers greater than 1 as a familiar case); explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number; and relating the principle of fraction equivalence $a/b = (n \times a)/(n \times b)$ to the effect of multiplying a/b by 1.	Module 4: Lesson 10: 193 Module 4: Lesson 11: 194–198
MAFS.5.NF.2.6:	Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem.	Module 4: Lesson 10: 193 Module 4: Lesson 11: 194–198 Module 4: Lesson 15: 209

Benchmark Code	Benchmark	Lessons Where Standard/Benchmark Is Directly Addressed In Major Tool (Most In–Depth Coverage Listed First)
MAFS.5.NF.2.7:	Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions. a. Interpret division of a unit fraction by a non-zero whole number, and compute such quotients. *For example, create a story context for (1/3) ÷ 4, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that (1/3) ÷ 4 = 1/12 because (1/12) × 4 = 1/3*. b. Interpret division of a whole number by a unit fraction, and compute such quotients. *For example, create a story context for 4 ÷ (1/5), and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that 4 ÷ (1/5) = 20 because 20 × (1/5) = 4*. c. Solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions, e.g., by using visual fraction models and equations to represent the problem. *For example, how much chocolate will each person get if 3 people share 1/2 lb of chocolate equally? How many 1/3-cup servings are in 2 cups of raisins?*	Module 3: Lesson 13: 134–138 Module 3: Lesson 14: 139 Module 4: Lesson 13: 200–203 Module 4: Lesson 14: 204–208

Benchmark Code	Benchmark	Lessons Where Standard/Benchmark Is Directly Addressed In Major Tool (Most In–Depth Coverage Listed First)
MAFS.5.OA.1.1:	Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.	Module 5: Lesson 2: 226–229 Module 5: Lesson PL2: 221
MAFS.5.OA.1.2:	Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. *For example, express the calculation "add 8 and 7, then multiply by 2" as 2 × (8 + 7). Recognize that 3 × (18932 + 921) is three times as large as 18932 + 921, without having to calculate the indicated sum or product.*	Module 5: Lesson 3: 230–232 Module 5: Lesson 2: 226–229
MAFS.5.OA.2.3:	Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane. *For example, given the rule "Add 3" and the starting number 0, and given the rule "Add 6" and the starting number 0, generate terms in the resulting sequences, and observe that the terms in one sequence are twice the corresponding terms in the other sequence. Explain informally why this is so.*	Module 5: Lesson 5: 234–237 Module 5: Lesson 10: 252–255 Module 7: Lesson 9: 340–343 Module 7: Lesson 10: 344–345

Benchmark Code	Benchmark	Lessons Where Standard/Benchmark Is Directly Addressed In Major Tool (Most In–Depth Coverage Listed First)
MAFS.K12.MP.1.1:	Make sense of problems and persevere in solving them.	Students learn the procedures of a strategy and are given tools to help them remember the procedures as they use them to build conceptual understanding. Struggling math students need reinforcement as they learn to remember these procedures. The How To box provides students with two different examples so they can repeat the procedure. For an example see: Module 1: Lesson 1: 51
MAFS.K12.MP.2.1:	Reason abstractly and quantitatively.	Visual models are used to introduce new concepts or skills in Vmath. Teachers provide a cognitive think aloud or modeling of reasons and ideas used. Students are able to witness how the visual model provides a representation that has meaning throughout the lesson. Hands-On and Gizmo Lessons provide students opportunities to make connections with manipulatives. Students explore different options and outcomes as they learn more about the concept through the use of manipulatives. For an example see: Module 1: Lesson 1: 2–5

Benchmark Code	Benchmark	Lessons Where Standard/Benchmark Is Directly Addressed In Major Tool (Most In–Depth Coverage Listed First)
MAFS.K12.MP.3.1:	Construct viable arguments and critique the reasoning of others.	Strong Vmath teachers use the components of Vmath to have students work in pairs to evaluate thinking. Write Math, Explain It, and Algebraic Thinking are perfect tools to help students begin to construct arguments and work together to compare. Vmath teachers use Critical Thinking questions to help students think more deeply about lesson skills and concepts. Critical Thinking questions focus on thinking skills such as deductive reasoning, decision making, and identifying and explaining errors. For an example see: Module 5: Lesson 5: 237
MAFS.K12.MP.4.1:	Model with mathematics.	As the Vmath student begins to make connections between the concepts of math and the skills needed for success, problem solving is introduced strategically throughout each Vmath module. These problem-solving components help students begin to learn how to formulate a plan. For an example see: Module 3: Lesson 1: 94
MAFS.K12.MP.5.1:	Use appropriate tools strategically.	Vmath is built on the philosophy that students need help in learning how to use the manipulatives and tools introduced in core math programs. Therefore, Vmath directly teaches how to use the tool taught in the lesson. Once students become proficient in how to use the tools, they are better able to transfer the application. For an example see: Module 6: Lesson 5: 280–283

Benchmark Code	Benchmark	Lessons Where Standard/Benchmark Is Directly Addressed In Major Tool (Most In–Depth Coverage Listed First)
MAFS.K12.MP.6.1:	Attend to precision.	Math Flash lessons and VmathLive provide students with practice to attend to precision and accuracy. In addition, each Vmath lesson also includes an Extra Practice component that can be used. For an example see: Module 7: Lesson 7: 334–335
MAFS.K12.MP.7.1:	Look for and make use of structure.	Vmath Hands-On lessons and Gizmos lessons integrated at point of use help teachers present important math concepts using either common manipulatives or Gizmos, online virtual manipulatives developed by Explore Learning. Additionally, in the daily Vmath lessons, the Build the Concept box uses visual models and pictorial representations to help students develop conceptual understanding. For an example see: Module 4: Lesson 1: 158
MAFS.K12.MP.8.1:	Look for and express regularity in repeated reasoning.	Vmath teachers use Critical Thinking questions to help students think more deeply about lesson skills and concepts. Critical Thinking questions focus on thinking skills such as deductive reasoning, decision making, and identifying and explaining errors. For an example see: Module 5: PL1: 219
LAFS.5.SL.1.1:	Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grade 5 topics and texts*, building on others' ideas and expressing their own clearly.	Each lesson begins with a collaborative conversation reviewing preskills. These reviews provide opportunities to discuss grade 5 topics.

Benchmark Code	Benchmark	Lessons Where Standard/Benchmark Is Directly Addressed In Major Tool (Most In–Depth Coverage Listed First)
LAFS.5.SL.1.2:	Summarize a written text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally.	Students have the opportunity to recount and discuss key instructions in each lesson in the program.
LAFS.5.SL.1.3:	Summarize the points a speaker makes and explain how each claim is supported by reasons and evidence.	Students have the opportunity to ask and answer questions in each lesson of the program as they learn academic vocabulary, review preskills, and learn new content.
LAFS.5.W.1.2:	Write informative/explanatory texts to examine a topic and convey ideas and information clearly.	This is beyond the scope of the program.
ELD.K12.ELL.MA.1:	English language learners communicate information, ideas and concepts necessary for academic success in the content area of Mathematics.	The Vmath Live Animated Glossary provides support for this standard.
ELD.K12.ELL.SI.1:	English language learners communicate for social and instructional purposes within the school setting.	Each lesson includes ELL differentiation and support to help students communicate for instructional purposes.