

A Correlation of

Scott Foresman • Addison Wesley

en**Vision**MATH™

to the

**Michigan**  
Grade Level Content Expectations  
Mathematics

Grades K-6



G/M-254

## Introduction

This correlation shows the close alignment between **Scott Foresman – Addison Wesley enVisionMATH**, copyright 2009, to the *Michigan Grade Level Content Expectations—Mathematics*. Correlation page references are to the Teacher’s Edition. Lessons in the Teacher’s Edition include facsimile pages of the Student Edition.

The en**Vision**MATH™ program is based around scientific research on how children learn mathematics as well as on classroom-based evidence that validates proven reliability.

### Personalized Curriculum

en**Vision**MATH™ provides 20 (16 in Kindergarten) focused topics that are coherent, digestible groups of lessons focusing on one or a few related content areas. A flexible sequence of topics is small enough for a district to rearrange into a personalized curriculum that matches the sequence preferred by the district. The curriculum is designed so that all standards can be taught before the major mathematics testing.

### Instructional Design

en**Vision**MATH™ teaches for deep conceptual understanding using research-based best practices. Essential understandings connected by Big Ideas are explicitly stated in the Teacher’s Edition. Daily Spiral Review and the Problem of the Day focus foundational skills and allow for ongoing practice with a variety of problem types. Daily interactive concept development encourages students to interact with teachers and other students to develop conceptual understanding.

Visual Learning allows students to benefit from seeing math ideas portrayed pictorially as well as being able to see connections between ideas. en**Vision**MATH™ created a Visual Learning Bridge which is a step-by-step bridge between the interactive learning activity and the lesson exercises to help students focus on one idea at a time and see the connections within the sequence of ideas. The strong sequential visual/verbal connections deepen conceptual understanding for students of all learning modalities and are particularly effective with English language learners and struggling readers. Guiding questions in blue type help the teacher guide students through the examples, ask probing questions to stimulate higher order thinking, and allow for checking of understanding.

### Differentiated Instruction

en**Vision**MATH™ engages and interests all students with leveled activities for ongoing differentiated instruction. A Teacher-Directed Intervention activity at the end of every lesson provides immediate opportunities to get students on track. In addition, ready made leveled learning centers for each lesson allow different students to do the same activity at different levels at the same time giving the teacher uninterrupted time to focus on reteaching students who require intervention. All centers can be used repeatedly due to the inclusion of a “Try Again” at the end. They can also be used for ongoing review and they can be used year after year. Topic-specific considerations for EL, Special Education, At-Risk, and Advanced students enable the teacher to accommodate the diverse learners in the classroom



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**Scott Foresman – Addison Wesley enVisionMATH  
to the  
Michigan Grade Level Content Expectations—Mathematics  
Kindergarten**

**NUMBER AND OPERATIONS**

**Count, write, and order numbers**

**N.ME.00.01 *Count objects in sets up to 30.***

**Topic 4:** 51A-52C, 55A-56C

**Topic 5:** 75A-76C, 81A-82C, 87A-88C

**Topic 12:** 213A-214C, 215A-216C, 217A-218C, 219A-220C

**N.ME.00.02 Use one-to-one correspondence to compare and order sets of objects to 30 using phrases such as “same number”, “more than”, or “less than”; use counting and matching.**

**Topic 4:** 63A-64C, 65A-66C, 67A-68C

**Topic 6:** 101A-102C, 103A-104C, 105A-106C, 107A-108C, 109A-110C

**N.ME.00.03 Compare and order numbers to 30 using phrases such as “more than” or “less than.”**

**Topic 4:** 63A-64C, 65A-66C, 67A-68C

**Topic 5:** 93A-94C

**Topic 6:** 101A-102C, 103A-104C, 105A-106C, 107A-108C, 109A-110C

**N.ME.00.04 *Read and write numbers to 30 and connect them to the quantities they represent.\****

**Topic 4:** 53A-54C, 57A-58C, 59A-60C

**Topic 5:** 79A-80C, 85A-86C, 91A-92C

**Topic 12:** 213A-214C, 215A-216C, 217A-218C, 219A-220C

**N.ME.00.05 Count orally to 100 by ones. Count to 30 by 2’s, 5’s and 10’s using grouped objects as needed.**

**Topic 4:** 51A-52C, 55A-56C

**Topic 5:** 75A-76C, 81A-82C, 87A-88C

**Topic 12:** 213A-214C, 215A-216C, 217A-218C, 219A-220C, 223A-224C, 225A-226C, 227A-228C, 229A-230C, 231A-232C

## Compose and decompose numbers

**N.ME.00.06** Understand the numbers 1 to 30 as having one, or two, or three groups of ten and some ones. Also count by tens with objects in ten-groups to 100.

**Topic 12:** 225A-22C

Also see Grade 1:

**Topic 11:** 303A-306B

**N.MR.00.07** *Compose and decompose numbers from 2 to 10, e.g.,  $5 = 4 + 1 = 2 + 3$ , with attention to the additive structure of number systems, e.g., 6 is one more than 5, 7 is one more than 6.\**

**Topic 4:** 61A-62C, 69A-70C

**Topic 5:** 77A-78C, 83A-84C, 89A-90C

**Topic 10:** 177A-178C, 179A-180C, 181A-182C, 183A-184C, 185A-186C, 187A-188C, 189A-190C

**N.MR.00.08** Describe and make drawings to represent situations/stories involving putting together and taking apart for totals up to 10; use finger and object counting.

**Topic 4:** 61A-62C, 69A-70C

**Topic 5:** 77A-78C, 83A-84C, 89A-90C

**Topic 10:** 177A-178C, 179A-180C, 181A-182C, 183A-184C, 185A-186C, 187A-188C, 189A-190C

## Add and subtract numbers

**N.MR.00.09** Record mathematical thinking by writing simple addition and subtraction sentences, e.g.,  $7 + 2 = 9$ ,  $10 - 8 = 2$ .

**Topic 10:** 117A-118C, 119A-120C

## Explore number patterns

**N.MR.00.10** Create, describe, and extend simple number patterns.

**Topic 12:** 222C, 224C, 225A-226C, 227A-228C, 229A-230C, 232C

## MEASUREMENT

### Explore concepts of time

**M.UN.00.01** Know and use the common words for the parts of the day (morning, afternoon, evening, night) and relative time (yesterday, today, tomorrow, last week, next year).

**Topic 14:** 255A-256C, 265A-266C

**Topic 15:** 275A-276C

**M.TE.00.02** Identify tools that measure time (clocks measure hours and minutes; calendars measure days, weeks, and months).

**Topic 14:** 259A-260C, 261A-262C

**Topic 15:** 227A-228C, 229A-230C

**M.UN.00.03** Identify daily landmark times to the nearest hour (lunchtime is 12 o'clock; bedtime is 8 o'clock).

**Topic 14:** 263A-264C

### Explore other measurement attributes

**M.UN.00.04** Compare two or more objects by length, weight and capacity, e.g., which is shorter, longer, taller?

**Topic 9:** 155A-156C, 157A-158C, 163A-164C, 167A-168C

**M.PS.00.05** Compare length and weight of objects by comparing to reference objects, and use terms such as shorter, longer, taller, lighter, heavier.

**Topic 9:** 155A-156C, 157A-158C, 167A-168C

## GEOMETRY

### Create, explore, and describe shapes

**G.GS.00.01** Relate familiar three-dimensional objects inside and outside the classroom to their geometric name, e.g., ball/sphere, box/cube, soup can/cylinder, ice cream cone/cone, refrigerator/prism.

**Topic 7:** 125A-126C

**G.GS.00.02** Identify, sort, and classify objects by attribute and identify objects that do not belong in a particular group.

**Topic 1:** 3A-4C, 5A-6C, 7A-8C, 9A-10C, 11A-12C

### Explore geometric patterns

**G.GS.00.03** Create, describe, and extend simple geometric patterns.

**Topic 3:** 37A-38C

**Scott Foresman – Addison Wesley enVisionMATH  
to the  
Michigan Grade Level Content Expectations—Mathematics  
Grade One**

**NUMBER AND OPERATIONS**

**Count, write, and order numbers**

**N.ME.01.01 Count to 110 by 1’s, 2’s, 5’s, and 10’s, starting from any number in the sequence; count to 500 by 100’s and 10’s; use ordinals to identify position in a sequence, e.g., 1st, 2nd, 3rd.**

**Topic 1:** 3, 4-6, 6B, 7, 8-10, 10B, 11, 12-14, 14B, 15, 16-18, 18B, 19, 20-22, 22B, 23, 24-26, 26B

**Topic 10:** 263, 264-266, 266B, 267, 268-270, 270B, 271, 272-274, 274B, 275, 276-278, 278B, 279, 280-282, 282B, 287, 288-290, 290B, 291, 292-294, 294B, 295, 296-298, 298B

**Topic 12:** 343, 344-346, 346B

**N.ME.01.02 Read and write numbers to 110 and relate them to the quantities they represent.**

**Topic 1:** 3, 4-6, 6B, 7, 8-10, 10B, 11, 12-14, 14B, 15, 16-18, 18B, 19, 20-22, 22B, 23, 24-26, 26B

**Topic 10:** 263, 264-266, 266B, 267, 268-270, 270B, 271, 272-274, 274B

**Topic 11:** 303, 304-306, 306B, 307, 308-310, 310B, 311, 312-314, 314B, 315, 316-318, 318B

**N.ME.01.03 Order numbers to 110; compare using phrases such as “same as”, “more than”, “greater than”, “fewer than”; use = symbol. Arrange small sets of numbers in increasing or decreasing order, e.g., write the following from smallest to largest: 21, 16, 35, 8.**

**Topic 2:** 31, 32-34, 34B, 35, 36-38, 38B, 39, 40-42, 42B, 43, 44-46, 46B

**Topic 12:** 339, 340-342, 342B, 343, 344-346, 346B, 347, 348-350, 350B, 351, 352-354, 354B, 355, 356-358, 358B, 359, 360-362, 362B

**N.ME.01.04 Identify one more than, one less than, 10 more than, and 10 less than for any number up to 100.**

**Topic 12:** 331, 332-334, 334B, 335, 336-338, 338B

**Topic 13:** 369, 370B, 371, 372, 373, 374, 374B, 383, 384, 385, 386, 386B



**N.ME.01.05 Understand that a number to the right of another number on the number line is bigger and that a number to the left is smaller.**

**Topic 2:** 39, 40-42, 42B

**Topic 12:** 347, 348-350, 350B

**N.ME.01.06 Count backward by 1's starting from any number between 1 and 100.**

**Topic 12:** 351, 352, 353, 354, 354B

### Explore place value

**N.ME.01.07 *Compose and decompose numbers through 30, including using bundles of tens and units, e.g., recognize 24 as 2 tens and 4 ones, 10 and 10 and 4, 20 and 4, and 24 ones.\****

**Topic 11:** 303, 304-306, 306B, 307, 308-310, 310B, 311, 312-314, 314B, 315, 316-318, 318B, 319, 320-322, 322B, 323, 324-326, 326B

### Add and subtract whole numbers

**N.ME.01.08 List number facts (partners inside of numbers) for 2 through 10, e.g.,  $8 = 7 + 1 = 6 + 2 = 5 + 3 = 4 + 4$ ;  $10 = 8 + 2 = 2 + 8$ .**

**Topic 3:** 51, 52-54, 54B, 55, 56-58, 58B, 59, 60-62, 62B, 63, 64-66, 66B, 67, 68-70, 70B, 71, 72-74, 74B, 75, 76-78, 78B

**Topic 5:** 127, 128-130, 130B, 131, 132-134, 134B, 135, 136-138, 138B

**Topic 6:** 155, 156-158, 158B

**N.MR.01.09 Compare two or more sets in terms of the difference in number of elements.**

**Topic 4:** 103, 104-106, 106B

**Topic 5:** 131, 132-134, 134B, 135, 136-138, 138B

**Topic 19:** 593, 594-596, 596B, 597, 598-600, 600B

**N.MR.01.10 *Model addition and subtraction for numbers through 30 for a given contextual situation using objects or pictures; explain in words; record using numbers and symbols; solve.\****

**Topic 6:** 143, 144-146, 146B, 147, 148-150, 150B, 151, 152-154, 154B, 155, 156-158, 158B, 159, 160-162, 162B

**Topic 7:** 171, 172-174, 174B, 175, 176-178, 178B, 179, 180-182, 182B, 183, 184-186, 186B

**Topic 16:** 481, 482-484, 484B, 485, 486-488, 488B, 489, 490-492, 492B, 497, 498-500, 500B, 517, 518-520, 520B, 521, 522-524, 524B, 525, 526-528, 528B, 529, 530-532, 532B

**N.MR.01.11 Understand the inverse relationship between addition and subtraction, e.g., subtraction “undoes” addition: if  $3 + 5 = 8$ , we know that  $8 - 3 = 5$  and  $8 - 5 = 3$ ; recognize that some problems involving combining, “taking away,” or comparing can be solved by either operation.**

**Topic 7:** 175, 176-178, 178B, 179, 180-182, 182B, 183, 184-186, 186B

**Topic 17:** 517, 518-520, 520B, 521, 522-524, 524B, 525, 526-528, 528B, 529, 530-532, 532B

**N.FL.01.12 Know all the addition facts up to  $10 + 10$ , and solve the related subtraction problems fluently.**

**Topic 6:** 143, 144-146, 146B, 147, 148-150, 150B, 151, 152-154, 154B, 155, 156-158, 158B, 159, 160-162, 162B

**Topic 7:** 175, 176-178, 178B, 179, 180-182, 182B, 183, 184-186, 186B

**Topic 16:** 481, 482-484, 484B, 485, 486-488, 488B, 489, 490-492, 492B, 497, 498-500, 500B, 501, 502-504, 504B

**Topic 17:** 517, 518-520, 520B, 521, 522-524, 524B, 525, 526-528, 528B, 529, 530-532, 532B

**N.MR.01.13 Apply knowledge of fact families to solve simple open sentences for addition and subtraction, such as:  $\square + 2 = 7$  and  $10 - \square = 6$ .**

**Topic 7:** 177, 180, 181, 182B, 184, 185, 186B

**Topic 17:** 523, 524B, 526, 527, 528, 528B, 530

**N.FL.01.14 Add three one-digit numbers.**

**Topic 16:** 505, 506-508, 508B

**N.FL.01.15 Calculate mentally sums and differences involving: a two-digit number and a one-digit number without regrouping; a two-digit number and a multiple of 10.**

**Topic 20:** 613, 614-616, 616B, 617, 618-620, 620B, 621, 622-624, 624B, 625, 626-628, 628B, 629, 630-632, 632B, 633, 634-636, 636B

**N.FL.01.16 *Compute sums and differences through 30 using number facts and strategies, but no formal algorithm.\****

**Topic 6:** 143, 144-146, 146B, 147, 148-150, 150B, 151, 152-154, 154B, 155, 156-158, 158B, 159, 160-162, 162B

**Topic 7:** 171, 172-174, 174B, 175, 176-178, 178B, 179, 180-182, 182B, 183, 184-186, 186B

**Topic 16:** 481, 482-484, 484B, 485, 486-488, 488B, 489, 490-492, 492B, 497, 498-500, 500B, 517, 518-520, 520B, 521, 522-524, 524B, 525, 526-528, 528B, 529, 530-532, 532B

**MEASUREMENT****Estimate and measure length**

**M.UN.01.01 Measure the lengths of objects in non-standard units, e.g., pencil lengths, shoe lengths, to the nearest whole unit.**

**Topic 14:** 399, 400-402, 402B, 403B, 404-406

**M.UN.01.02 Compare measured lengths using the words shorter, shortest, longer, longest, taller, tallest, etc.**

**Topic 14:** 395, 396-398, 398B

**MEASUREMENT****Tell time**

**M.UN.01.03 Tell time on a twelve-hour clock face to the hour and half-hour.**

**Topic 15:** 453, 454-456, 456B, 457, 458-460, 460B, 461, 462-464, 464B

**Work with money**

**M.UN.01.04 Identify the different denominations of coins and bills.**

**Topic 13:** 367, 368, 369, 371, 372, 373, 375, 376, 377, 379, 380, 381

**M.UN.01.05 Match one coin or bill of one denomination to an equivalent set of coins/bills of other denominations, e.g., 1 quarter = 2 dimes and 1 nickel.**

**Topic 13:** 367, 368-370, 370B, 371, 372-374, 374B, 375, 376-378, 378B, 379, 380-382, 382B, 383, 384-386, 386B

**M.UN.01.06 Tell the amount of money: in cents up to \$1, in dollars up to \$100. Use the symbols \$ and ¢.**

**Topic 13:** 370, 370B, 374, 374B, 382, 383, 384-385, 386B

**M.PS.01.07 Add and subtract money in dollars only or in cents only.**

**Topic 13:** 388, 389, 390B

**Topic 20:** 612B, 636B

**Solve problems**

**M.PS.01.08 Solve one-step word problems using addition and subtraction of length, money and time, including “how much more/less”, without mixing units.**

**Topic 13:** 388-389, 390B

**Topic 16:** 496B

**Topic 20:** 612B, 636B, 638, 640B

## GEOMETRY

### Create and describe shapes

**G.GS.01.01 Create common two-dimensional and three-dimensional shapes, and describe their physical and geometric attributes, such as color and shape.**

**Topic 8:** 195, 196-198, 198B, 199, 200-202, 202B, 227, 228-230, 230B, 231, 232-234, 234B, 235, 236-238, 238B

**G.LO.01.02 Describe relative position of objects on a plane and in space, using words such as above, below, behind, in front of.**

**Topic 8:** 211, 212-214, 214B

Also see Kindergarten:

**Topic 2:** 17A-18C, 19A-20C, 21A-22C, 23A-24C, 25A-26C, 27A-28C

### Create and describe patterns involving geometric objects

**G.SR.01.03 Create and describe patterns, such as repeating patterns and growing patterns using number, shape, and size.**

**Topic 9:** 243, 244-246, 246B, 247, 248-250, 250B, 251, 252-254, 254B, 255, 256-257, 257B

**G.SR.01.04 Distinguish between repeating and growing patterns.**

**Topic 9:** 243, 244-246, 246B, 257

**G.SR.01.05 Predict the next element in a simple repeating pattern.**

**Topic 9:** 247, 248-250, 250B, 251, 252-254, 254B, 255, 256-257, 257B

**G.SR.01.06 Describe ways to get to the next element in simple repeating patterns.**

**Topic 9:** 247, 248-250, 250B, 251, 252-254, 254B, 255, 256-257, 257B

## DATA AND PROBABILITY

### Use pictographs

**D.RE.01.01 Collect and organize data to use in pictographs.**

**Topic 18:** 565, 566-568, 568B, 572

**D.RE.01.02 Read and interpret pictographs.**

**Topic 18:** 545, 546-548, 548B, 565, 566-568, 568B, 572

**D.RE.01.03 Make pictographs of given data using both horizontal and vertical forms of graphs; scale should be in units of one and include symbolic representations, e.g., ☺ represents one child.**

**Topic 18:** 565, 566-568, 568B, 572

**Scott Foresman – Addison Wesley enVisionMATH  
to the  
Michigan Grade Level Content Expectations—Mathematics  
Grade Two**

**NUMBER AND OPERATIONS**

**Count, write, and order whole numbers**

**N.ME.02.01 Count to 1000 by 1’s, 10’s and 100’s starting from any number in the sequence.**

**Topic 4:** 120, 121, 122B, 129, 130B

**Topic 17:** 511, 513, 514, 514B, 527, 528-530, 530B, 543B, 544, 546B

**N.ME.02.02 Read and write numbers to 1000 in numerals and words, and relate them to the quantities they represent.**

**Topic 4:** 107, 108-110, 110B

**Topic 17:** 515, 516-518, 518B, 519, 520-522, 522B

**N.ME.02.03 Compare and order numbers to 1000; use the symbols  $>$  and  $<$ .**

**Topic 4:** 111, 112-114, 114B, 115, 116-118, 118B, 119, 120-122, 122B, 123, 124-126, 126B

**Topic 17:** 531, 532-534, 534B, 535, 536-538, 538B, 539, 540-542, 542B

**N.ME.02.04 Count orally by 3’s and 4’s starting with 0, and by 2’s, 5’s, and 10’s starting from any whole number.\***

**Topic 4:** 127, 128-130, 130B

**Topic 17:** 527, 528, 529, 530B, 543, 544, 546B

**Understand place value**

**N.ME.02.05 *Express numbers through 999 using place value, e.g., 137 is 1 hundred, 3 tens, and 7 ones; use concrete materials.\****

**Topic 4:** 99, 100-102, 102B, 103, 104-106, 106B

**Topic 17:** 515, 516-518, 518B, 519, 520-522, 522B

**Add and subtract whole numbers**

**N.FL.02.06 Decompose 100 into addition pairs, e.g.,  $99 + 1$ ,  $98 + 2$ ...**

**Topic 7:** 199, 200-202, 202B

**N.MR.02.07 Find the distance between numbers on the number line, e.g., how far is 79 from 26?**

**Topic 3:** 74B

Also see Grade 1:

**Topic 7:** 174B

**Topic 17:** 532B

**N.MR.02.08 Find missing values in open sentences, e.g.,  $42 + \square = 57$ ; use relationship between addition and subtraction.**

**Topic 2:** 37, 40, 41, 42B, 45, 47

**Topic 3:** 73, 76, 80, 81, 82B, 83, 84, 85, 86B, 88, 89, 90, 90B

**Topic 6:** 177, 181, 185

**Topic 7:** 197, 199, 201, 202B, 205, 207, 208, 209, 210B

**Topic 8:** 221, 229

**Topic 9:** 257, 261

**Topic 18:** 553, 567, 568, 569, 570B

**N.MR.02.09 *Given a contextual situation that involves addition and subtraction using numbers through 99: model using objects or pictures; explain in words; record using numbers and symbols; solve.\****

**Topic 2:** 38, 42, 46, 50, 54, 58, 62, 63-66, 66B

**Topic 3:** 74, 78, 82, 86, 90, 91, 92-94, 94B

**Topic 6:** 174, 178, 182, 186

**Topic 7:** 198, 202, 206, 210

**Topic 8:** 222, 226, 230, 234, 238, 243, 244-245, 246B

**Topic 9:** 254, 258, 262, 266, 270, 274

**Topic 10:** 283, 284-286, 286B, 294, 295, 296-298, 298B, 306

**N.FL.02.10 *Add fluently two numbers through 99, using strategies including formal algorithms; subtract fluently two numbers through 99.\****

**Topic 2:** 35, 36-38, 38B, 39, 40-42, 42B, 43, 44-46, 46B, 47, 48-50, 50B, 55, 56-58, 58B, 59, 60-62, 62B

**Topic 3:** 71, 72-74, 74B, 75, 76-78, 78B, 79, 80-82, 82B, 83, 84-86, 86B

**Topic 6:** 171, 172-174, 174B, 175, 176-178, 178B, 179, 180-182B, 183, 184-186, 186B

**Topic 7:** 195, 196-198, 198B, 199, 200-202, 202B, 203, 204-206, 206B, 207, 208-210, 210B

**Topic 8:** 219, 220-222, 222B, 223, 224-226, 226B, 227, 228-230, 230B, 231, 232-234, 234B, 235, 236-238, 238B

**Topic 9:** 251, 252-254, 254B, 255, 256-258, 258B, 259, 260-262, 262B, 263, 264-266, 266B, 267, 268-270, 270B

**N.FL.02.11** *Estimate the sum of two numbers with three digits.\**

**Topic 18:** 555, 556-558, 558B

**N.FL.02.12** Calculate mentally sums and differences involving: three-digit numbers and ones; three-digit numbers and tens; three-digit numbers and hundreds.

**Topic 17:** 513, 514B, 523, 524-526, 526B

**Topic 18:** 551, 552-554, 554B, 567, 568-570, 570B

### Understand meaning of multiplication and division

**N.MR.02.13** Understand multiplication as the result of counting the total number of objects in a set of equal groups, e.g.,  $3 \times 5$  gives the number of objects in 3 groups of 5 objects, or  $3 \times 5 = 5 + 5 + 5 = 15$ .

**Topic 19:** 591, 592-594, 594B, 599, 600-602, 602B, 603, 604-606, 606B, 611, 612-614, 614B

**N.MR.02.14** Represent multiplication using area and array models.

**Topic 19:** 595, 596-598, 598B, 607, 608-610, 610B

**N.MR.02.15** Understand division ( $\div$ ) as another way of expressing multiplication, using fact families within the  $5 \times 5$  multiplication table; emphasize that division “undoes” multiplication, e.g.,  $2 \times 3 = 6$  can be rewritten as  $6 \div 2 = 3$  or  $6 \div 3 = 2$ .

**Topic 20:** 631, 632-634, 634B

**N.MR.02.16** *Given a situation involving groups of equal size or of sharing equally, represent with objects, words, and symbols; solve.\**

**Topic 19:** 591, 592-594, 594B, 603, 604-606, 606B, 611, 612-614, 614B

**Topic 20:** 619, 620-622, 622B, 623, 624-626, 626B, 627, 628-630, 630B, 635, 636-638, 638B

**N.MR.02.17** *Develop strategies for fluently multiplying numbers up to  $5 \times 5$ .\**

**Topic 19:** 591, 592-594, 594B, 595, 596-598, 598B, 603, 604-606, 606B, 607, 608-610, 610B, 611, 612-614, 614B

### Work with unit fractions

**N.ME.02.18** Recognize, name, and represent commonly used unit fractions with denominators 12 or less; model  $1/2$ ,  $1/3$ , and  $1/4$  by folding strips.

**Topic 12:** 355, 356-358, 358B

**N.ME.02.19 Recognize, name, and write commonly used fractions:  $\frac{1}{2}$ ,  $\frac{1}{3}$ ,  $\frac{2}{3}$ ,  $\frac{1}{4}$ ,  $\frac{2}{4}$ ,  $\frac{3}{4}$ .**

**Topic 12:** 355, 356-358, 359, 360-362, 362B, 368, 369, 370B, 374

**N.ME.02.20 Place 0 and halves, e.g.,  $\frac{1}{2}$ ,  $1\frac{1}{2}$ ,  $2\frac{1}{2}$ , on the number line; relate to a ruler.**

**Topic 13:** 392-394, 396-397

Also see Grade 3:

**Topic 12:** 290B, 290-291, 292, 293, 293B

**Topic 14:** 332B, 332-333, 333B

**N.ME.02.21 For unit fractions from  $\frac{1}{12}$  to  $\frac{1}{2}$  understand the inverse relationship between the size of a unit fraction and the size of the denominator; compare unit fractions from  $\frac{1}{12}$  to  $\frac{1}{2}$ .**

**Topic 12:** 355, 356-358, 358B

**N.ME.02.22 Recognize that fractions such as  $\frac{2}{2}$ ,  $\frac{3}{3}$ , and  $\frac{4}{4}$  are equal to the whole (one).**

**Topic 12:** 359

Also see Grade 3:

**Topic 12:** 278B, 278, 279B

## **MEASUREMENT Measure, add, and subtract length**

**M.UN.02.01 Measure lengths in meters, centimeters, inches, feet, and yards approximating to the nearest whole unit and using abbreviations: cm, m, in, ft, yd.**

**Topic 13:** 391, 392-394, 394B, 395, 396-398, 398B

**M.PS.02.02 Compare lengths; add and subtract lengths (no conversion of units).**

**Topic 13:** 390, 391, 392, 393, 394, 395, 398, 398B

Also see Grade 3:

**Topic 16:** 368B, 368-369, 369B, 370B, 370-371, 371B

## **Understand the concept of area**

**M.UN.02.03 Measure area using non-standard units to the nearest whole unit.**

**Topic 13:** 403, 404-406, 406B, 407, 408, 409, 410, 410B



**M.TE.02.04 Find the area of a rectangle with whole number side lengths by covering with unit squares and counting, or by using a grid of unit squares; write the area as a product.**

**Topic 13:** 403, 404, 405, 406B

Also see Grade 3:

**Topic 16:** 376B, 376-377, 377B

### **Tell time and solve time problems**

**M.UN.02.05 Using both A.M. and P.M., tell and write time from the clock face in 5 minute intervals and from digital clocks to the minute; include reading time: 9:15 as nine-fifteen and 9:50 as nine-fifty. Interpret time both as minutes after the hour and minutes before the next hour, e.g., 8:50 as eight-fifty and ten to nine. Show times by drawing hands on clock face.**

**Topic 15:** 451, 452-454, 454B, 455, 456-458, 458B

**M.UN.02.06 Use the concept of duration of time, e.g., determine what time it will be half an hour from 10:15.**

**Topic 15:** 459, 460-462, 462B, 466, 466B, 471, 472-474, 474B

### **Record, add and subtract money**

**M.UN.02.07 Read and write amounts of money using decimal notations, e.g., \$1.15.**

**Topic 5:** 157, 158B, 159, 160-162, 162B

**M.PS.02.08 Add and subtract money in mixed units, e.g., \$2.50 + 60 cents and \$5.75 - \$3, but not \$2.50 + \$3.10.**

**Topic 5:** 159, 160-162, 162B

**Topic 10:** 283, 284-286, 286B, 295, 296-298, 298B

Also see Grade 3:

**Topic 13:** 313, 314, 315B

### **Read thermometers**

**M.UN.02.09 Read temperature using the scale on a thermometer in degrees Fahrenheit.**

**Topic 15:** 467, 468-470, 470B

**Solve measurement problems**

**M.PS.02.10 Solve simple word problems involving length and money.**

**Topic 5:** 146, 146B, 150, 150B, 154, 154B, 158, 158B, 161, 161B, 164-165, 166B

**Topic 13:** 391, 392-394, 394B, 395, 396-398, 398B

***M.TE.02.11 Determine perimeters of rectangles and triangles by adding lengths of sides, recognizing the meaning of perimeter.\****

**Topic 13:** 399, 402, 402B, 407, 408, 409, 410, 410B

Also see Grade 3:

**Topic 16:** 369, 369B, 370B, 370, 371, 371B

**GEOMETRY Identify and describe shapes**

**G.GS.02.01 Identify, describe, and compare familiar two-dimensional and three-dimensional shapes, such as triangles, rectangles, squares, circles, semi-circles, spheres, and rectangular prisms.**

**Topic 11:** 315, 316-318, 318B, 319, 320-322, 322B

**G.GS.02.02 Explore and predict the results of putting together and taking apart two-dimensional and three-dimensional shapes.**

**Topic 11:** 323, 324-326, 326B, 327, 328-330, 330B

**G.GS.02.04 Distinguish between curves and straight lines and between curved surfaces and flat surfaces.**

**Topic 11:** 315, 316, 317, 318, 318B, 319, 320-322, 322B

**G.SR.02.05 Classify familiar plane and solid objects, e.g., square, rectangle, rhombus, cube, pyramid, prism, cone, cylinder, and sphere, by common attributes such as shape, size, color, roundness, or number of corners and explain which attributes are being used for classification.**

**Topic 11:** 315, 316-318, 318B, 319, 320-322, 322B, 343, 344-346, 346B

**G.TR.02.06 Recognize that shapes that have been slid, turned, or flipped are the same shape, e.g., a square rotated 45° is still a square.**

**Topic 11:** 335, 336-338, 338B

**Use coordinate systems**

**G.LO.02.07 Find and name locations using simple coordinate systems such as maps and first quadrant grids.**

**Topic 16:** 491, 492-494, 494B

**DATA AND PROBABILITY**

**Create, interpret, and solve problems involving pictographs**

**D.RE.02.01 Make pictographs using a scale representation, using scales where symbols equal more than one.**

**Topic 16:** 483, 484, 485, 486, 486B

**D.RE.02.02 Read and interpret pictographs with scales, using scale factors of 2 and 3.**

**Topic 16:** 485, 486B

**D.RE.02.03 Solve problems using information in pictographs; include scales such as each ■ represents 2 apples, avoid ■ cases.**

**Topic 16:** 483, 484-486, 486B

**Scott Foresman – Addison Wesley enVisionMATH  
to the  
Michigan Grade Level Content Expectations—Mathematics  
Grade Three**

**NUMBER AND OPERATIONS**

**Understand and use number notation and place value**

**N.ME.03.01** Read and write numbers to 10,000 in both numerals and words, and relate them to the quantities they represent, e.g., relate numeral or written word to a display of dots or objects.

**Topic 1:** 4B, 4-5, 5B, 6B, 6-7, 7B

**N.ME.03.02** *Identify the place value of a digit in a number, e.g., in 3,241, 2 is in the hundreds place. Recognize and use expanded notation for numbers using place value through 9,999, e.g., 2,517 is  $2000 + 500 + 10 + 7$ ; 4 hundreds and 2 ones is 402.\**

**Topic 1:** 4B, 4-5, 5B, 6B, 6-7, 7B

**N.ME.03.03** Compare and order numbers up to 10,000.

**Topic 1:** 12B, 12-13, 14, 15B, 16B, 16-17, 17B

**Count in steps, and understand even and odd numbers**

**N.ME.03.04** Count orally by 6's, 7's, 8's, and 9's starting with 0, making the connection between repeated addition and multiplication.

**Topic 1:** 15

**Topic 5:** 108B, 108-109, 109B

**N.ME.03.05** Know that even numbers end in 0, 2, 4, 6, or 8; name a whole number quantity that can be shared in two equal groups or grouped into pairs with no remainders; recognize even numbers as multiples of 2. Know that odd numbers end in 1, 3, 5, 7, or 9, and work with patterns involving even and odd numbers.

**Topic 5:** 122, 125B

**Add and subtract whole numbers**

**N.FL.03.06** *Add and subtract fluently two numbers through 999 with regrouping and through 9,999 without regrouping.\**

**Topic 2:** 34B, 34, 35, 35B, 48B, 48-49, 49B, 50B, 50-51, 52, 53, 53B, 54B, 54-55, 55B

**Topic 3:** 66B, 66-67, 67B, 68B, 68-69, 70, 71B

**Topic 4:** 86B, 86-87, 87B, 88B, 88-89, 89B, 90B, 90-91, 91B, 92B, 92-93, 95B, 96B, 96-97, 97B

**N.FL.03.07** **Estimate the sum and difference of two numbers with three digits (sums up to 1,000), and judge reasonableness of estimates.**

**Topic 2:** 44B, 44-45, 46, 47, 47B

**Topic 3:** 74B, 77-75, 76, 77, 77B, 78B, 78-79, 79B

**Topic 4:** 89, 93, 94

**N.FL.03.08** **Use mental strategies to fluently add and subtract two-digit numbers.**

**Topic 2:** 36B, 36-37, 38, 39, 39B

**Topic 3:** 72B, 72-73, 73B

**Multiply and divide whole numbers**

**N.MR.03.09** **Use multiplication and division fact families to understand the inverse relationship of these two operations, e.g., because  $3 \times 8 = 24$ , we know that  $24 \div 8 = 3$  or  $24 \div 3 = 8$ ; express a multiplication statement as an equivalent division statement.**

**Topic 8:** 184B, 184-185, 185B, 186B, 186-187, 188, 189B, 190B, 190-191, 191B, 192B, 192-193, 193B, 194, 195

**N.MR.03.10** *Recognize situations that can be solved using multiplication and division including finding “How many groups?” and “How many in a group?” and write mathematical statements to represent those situations.\**

**Topic 5:** 108B, 108, 109, 109B, 110B, 110, 111, 112, 113, 113B, 114B, 114, 115, 115B, 122B, 122, 123, 125, 125B, 126B, 126, 127, 128, 128B, 128, 129, 129B, 130, 131, 131B

**Topic 6:** 140B, 140, 141, 141B, 142B, 143, 143B, 144B, 144, 145, 147, 147B, 148B, 148, 149, 149B, 150B, 150, 151, 151B

**Topic 7:** 164B, 164, 165, 165B, 166B, 166, 167, 168, 169, 169B, 170B, 170, 171, 171B

**Topic 8:** 185, 185B, 186B, 186, 187, 188, 189B, 190B, 190, 191, 191B, 192B, 192, 193, 193B, 195B, 196B, 196, 197, 199, 199B

**N.FL.03.11 Find products fluently up to  $10 \times 10$ ; find related quotients using multiplication and division relationships.**

**Topic 5:** 122B, 122-123, 124, 125, 125B, 126B, 126-127, 127B, 128B, 128-129, 129B, 130B, 130-131, 131B

**N.MR.03.12 Find solutions to open sentences, such as  $7 \times \square = 42$  or  $12 \div \square = 4$ , using the inverse relationship between multiplication and division.**

**Topic 5:** 111, 112, 113B

**Topic 8:** 184, 185, 185B, 188, 189B

**N.FL.03.13 Mentally calculate simple products and quotients up to a three-digit number by a one-digit number involving multiples of 10, e.g.,  $500 \times 6$ , or  $400 \div 8$ .**

**Topic 5:** 126B, 126-127, 127B

**Topic 7:** 170, 171, 171B

**N.MR.03.14 Solve division problems involving remainders, viewing the remainder as the “number left over”; interpret based on problem context, e.g., when we have 25 children with 4 children per group then there are 6 groups with 1 child left over.\***

**Topic 7:** 166B, 166-167, 168, 169B

### Problem-solving with whole numbers

**N.MR.03.15 Given problems that use any one of the four operations with appropriate numbers, represent with objects, words (including “product” and “quotient”), and mathematical statements; solve.**

**Topic 2:** 34B, 34, 35B, 36B, 36, 37, 38, 48B, 48, 49, 49B, 51, 52, 53, 54B, 54, 55B, 56B, 56, 57, 57B, 58B, 55-59, 59B

**Topic 3:** 66B, 66-67, 67B, 69, 70, 71, 72, 72B, 72, 73, 73B, 78B, 78-79, 79B

**Topic 4:** 86, 87, 87B, 88B, 88, 89, 89B, 90B, 90, 91, 91B, 92B, 93, 94, 95B, 96B, 97, 97B, 98B, 98-99, 100, 101B

**Topic 5:** 108B, 108, 109, 109B, 110B, 110, 111, 112, 113, 113B, 114B, 114, 115, 115B, 116B, 116, 117, 117B, 118B, 118-119, 120, 121B, 122B, 122, 123, 124, 125, 125B, 126B, 126, 127, 127B, 128B, 128, 129, 129B, 130B, 130, 131, 131B

**Topic 6:** 140B, 140, 141, 141B, 142B, 142, 143, 143B, 144B, 144, 145, 147, 147B, 148B, 148, 149, 149B, 150B, 150, 151, 151B, 152B, 152, 153, 153B

**Topic 7:** 164B, 164, 165, 165B, 166B, 166, 167, 168, 169, 169B, 170B, 170, 171, 171B

**Topic 8:** 185, 185B, 186B, 187, 188, 189B, 190B, 190, 191, 191B, 192B, 192, 193, 193B, 195B, 196B, 196, 197, 199, 199B

**Understand simple fractions, relation to the whole, and addition and subtraction of fractions**

**N.ME.03.16** Understand that fractions may represent a portion of a whole unit that has been partitioned into parts of equal area or length; use the terms “numerator” and “denominator.”

**Topic 12:** 276B, 276-277, 277B, 278B, 278-279, 279B, 282B, 282, 283, 283B, 286, 287, 287B

**N.ME.03.17** Recognize, name, and use equivalent fractions with denominators 2, 4, and 8, using strips as area models.

**Topic 12:** 284B, 284-285, 286, 287, 287B

**N.ME.03.18** Place fractions with denominators of 2, 4, and 8 on the number line; relate the number line to a ruler; compare and order up to three fractions with denominators 2, 4, and 8.

**Topic 12:** 288B, 288, 289, 289B, 290B, 291, 292, 293, 293B

**N.ME.03.19** Understand that any fraction can be written as a sum of unit fractions, e.g.,  $\frac{3}{4} = \frac{1}{4} + \frac{1}{4} + \frac{1}{4}$ .

**Topic 12:** 294B, 294

**N.MR.03.20** Recognize that addition and subtraction of fractions with equal denominators can be modeled by joining or taking away segments on the number line.

**Topic 12:** 294B, 294, 295, 295B, 296B, 296, 297, 297B

**Understand simple decimal fractions in relation to money**

**N.ME.03.21** *Understand and relate decimal fractions to fractional parts of a dollar, e.g.,  $\frac{1}{2}$  dollar = \$0.50;  $\frac{1}{4}$  dollar = \$0.25.\**

**Topic 13:** 309, 311

**MEASUREMENT****Measure and use units for length, weight, temperature and time**

**M.UN.03.01** Know and use common units of measurements in length, weight, and time.

**Topic 14:** 328B, 328-329, 330, 331, 331B, 334B, 334-335, 336, 337, 337B, 340B, 340-341, 341B

**Topic 15:** 350B, 350-351, 351B, 352B, 352-353, 354, 355, 355B, 358B, 358-359, 359B

**Topic 17:** 398B, 398-399, 399B

**M.UN.03.02 Measure in mixed units within the same measurement system for length, weight, and time: feet and inches, meters and centimeters, kilograms and grams, pounds and ounces, liters and milliliters, hours and minutes, minutes and seconds, years and months.**

**Topic 14:** 328B, 329, 330, 331, 331B, 332B, 332, 333, 333B, 334B, 338B, 338, 339, 340B, 340, 341, 341B

**Topic 15:** 350B, 350, 351, 351B, 356B, 356, 357, 357B, 358B, 358, 359, 359B

**Topic 17:** 398B, 398-399, 399B

**M.UN.03.03 Understand relationships between sizes of standard units, e.g., feet and inches, meters and centimeters.**

**Topic 14:** 334B, 334-335, 336, 337B, 339, 339B, 340B, 341, 341B

**Topic 15:** 350, 352B, 352, 354, 355, 355B, 356B, 357, 357B, 358B, 359, 359B

**Topic 17:** 398B, 398-399, 399B

**M.UN.03.04 Know benchmark temperatures such as freezing (32°F, 0°C); boiling (212°F, 100°C); and compare temperatures to these, e.g., cooler, warmer.**

**Topic 17:** 402B, 402-403, 403B

### **Understand meaning of area and perimeter and apply in problems**

**M.UN.03.05 Know the definition of area and perimeter and calculate the perimeter of a square and rectangle given whole number side lengths.**

**Topic 16:** 368B, 368-369, 369B, 370B, 370-371, 371B, 372B, 372-373, 373B, 376B, 376-377, 377B

**M.UN.03.06 Use square units in calculating area by covering the region and counting the number of square units.**

**Topic 16:** 378B, 378, 379, 379B

**M.UN.03.07 Distinguish between units of length and area and choose a unit appropriate in the context.**

**Topic 16:** 368B, 368-369, 369B, 370B, 370-371, 371B, 372B, 372-373, 373B, 376B, 376-377, 377B

**M.UN.03.08 Visualize and describe the relative sizes of one square inch and one square centimeter.**

**Topic 16:** 376B, 376-377, 377B



**Estimate perimeter and area**

**M.TE.03.09 Estimate the perimeter of a square and rectangle in inches and centimeters; estimate the area of a square and rectangle in square inches and square centimeters.**

**Topic 16:** 378B, 378-379, 379B

**Solve measurement problems**

**M.PS.03.10 Add and subtract lengths, weights, and times using mixed units within the same measurement system.**

**Topic 2:** 54B, 54, 55, 55B

**Topic 4:** 87, 87B, 89, 91, 94, 97, 97B, 99, 101B

**Topic 14:** 341

**Topic 16:** 368B, 368-369, 369B, 370B, 370-371, 371B, 372-373, 373B

**Topic 17:** 400B, 400-401, 401B

**M.PS.03.11 Add and subtract money in dollars and cents.**

**Topic 13:** 312B, 312-313, 314, 315B

**M.PS.03.12 Solve applied problems involving money, length, and time.**

**Topic 13:** 312B, 312-313, 314, 315B

**Topic 16:** 38, 69, 369, 370, 371, 371B, 372, 373, 376B, 376, 377, 377B

**Topic 17:** 400B, 400-401, 401B

**M.PS.03.13 Solve contextual problems about perimeters of rectangles and areas of rectangular regions.**

**Topic 16:** 368, 369, 369B, 370, 371, 371B, 372, 373, 376B, 376, 377, 377B

**GEOMETRY****Recognize the basic elements of geometric objects**

**G.GS.03.01 Identify points, line segments, lines, and distance.**

**Topic 10:** 242B, 242-243, 243B, 245, 245B

**G.GS.03.02 Identify perpendicular lines and parallel lines in familiar shapes and in the classroom.**

**Topic 10:** 242B, 242, 243, 243B, 245, 245B

**G.GS.03.03 Identify parallel faces of rectangular prisms in familiar shapes and in the classroom.**

**Topic 10:** 234B, 234, 236, 237, 237B, 238B

**Name and explore properties of shapes**

**G.GS.03.04** Identify, describe, compare, and classify two-dimensional shapes, e.g., parallelogram, trapezoid, circle, rectangle, square, and rhombus, based on their component parts (angles, sides, vertices, line segment) and on the number of sides and vertices.

**Topic 10:** 246B, 246-247, 247B, 248B, 248-249, 249B, 250B, 250-251, 251B, 252B, 252-253, 253B

**G.SR.03.05** Compose and decompose triangles and rectangles to form other familiar two-dimensional shapes, e.g., form a rectangle using two congruent right triangles, or decompose a parallelogram into a rectangle and two right triangles.

**Topic 10:** 249, 251

**Topic 11:** 268B, 268, 269, 269B

**Explore and name three-dimensional solids**

**G.GS.03.06** Identify, describe, build, and classify familiar three-dimensional solids, e.g., cube, rectangular prism, sphere, pyramid, cone, based on their component parts (faces, surfaces, bases, edges, vertices).

**Topic 10:** 234B, 234-235, 236, 237, 237B, 238B, 238-239, 240, 241, 241B

**G.SR.03.07** Represent front, top, and side views of solids built with cubes.

**Topic 14:** 342B, 342-343, 343B

**DATA AND PROBABILITY****Use bar graphs**

**D.RE.03.01** Read and interpret bar graphs in both horizontal and vertical forms.

**Topic 20:** 460, 462, 463, 463B, 466B, 466, 467, 467B, 482B, 482, 483, 483B

**D.RE.03.02** Read scales on the axes and identify the maximum, minimum, and range of values in a bar graph.

**Topic 20:** 460, 462, 463, 463B, 466B, 466, 467, 467B, 482B, 482, 483, 483B

**D.RE.03.03** Solve problems using information in bar graphs, including comparison of bar graphs.

**Topic 20:** 460, 462, 463, 463B, 466B, 466, 467, 467B, 482B, 482, 483, 483B

**Scott Foresman – Addison Wesley enVisionMATH  
to the  
Michigan Grade Level Content Expectations—Mathematics  
Grade Four**

**NUMBER AND OPERATIONS**

**Understand and use number notation and place value**

**N.ME.04.01 Read and write numbers to 1,000,000; relate them to the quantities they represent; compare and order.**

**Topic 1:** 4B, 4-5, 6, 7B, 8B, 8-9, 9B, 10B, 10-11, 12, 13, 13B

**N.ME.04.02 Compose and decompose numbers using place value to 1,000,000's, e.g., 25,068 is 2 ten thousands, 5 thousands, 0 hundreds, 6 tens, and 8 ones.**

**Topic 1:** 4B, 4-5, 6, 7B, 8, 9, 9B

**N.ME.04.03 Understand the magnitude of numbers up to 1,000,000; recognize the place values of numbers and the relationship of each place value to the place to its right, e.g., 1,000 is 10 hundreds.**

**Topic 1:** 4B, 4-5, 6, 7B, 8B, 8, 9, 9B

**Use factors and multiples**

**N.ME.04.04 *Find all factors of any whole number through 50, list factor pairs, and determine if a one-digit number is a factor of a given whole number.\****

**Topic 8:** 182B, 182-183, 183B, 184B, 184, 185B

**N.ME.04.05 *List the first ten multiples of a given one-digit whole number; determine if a whole number is a multiple of a given one-digit whole number.\****

**Topic 3:** 58B, 58, 59, 59B

**N.MR.04.06 Know that some numbers including 2, 3, 5, 7, and 11 have exactly two factors (1 and the number itself) and are called prime numbers.**

**Topic 8:** 184B, 184, 185, 185B

**N.MR.04.07 *Use factors and multiples to compose and decompose whole numbers.\****

**Topic 1:** 4B, 4, 5, 7B, 8B, 8, 9, 9B

**Topic 8:** 182B, 182

**Add and subtract whole numbers****N.FL.04.08 Add and subtract whole numbers fluently.****Topic 2:** 28B, 28-29, 30, 31, 31B, 36B, 36-37, 38, 39, 39B, 40B, 40-41, 41B, 42B, 42-43, 43B**Multiply and divide whole numbers****N.ME.04.09 Multiply two-digit numbers by 2, 3, 4, and 5 using the distributive property, e.g.,  $21 \times 3 = (1 + 20) \times 3 = (1 \times 3) + (20 \times 3) = 3 + 60 = 63$ .****Topic 3:** 62B, 64B, 66B, 66-67, 67B**Topic 5:** 98B, 98-99, 99B, 110B, 110-111, 112, 113B**N.FL.04.10 Multiply fluently any whole number by a one-digit number and a three-digit number by a two-digit number; for a two-digit by one-digit multiplication use distributive property to develop meaning for the algorithm.****Topic 3:** 58B, 58-59, 59B, 60, 61B, 62B, 62-63, 63B, 64B, 64-65, 65B, 66B, 66-67, 67B**Topic 5:** 96B, 96, 97, 97B, 98B, 98, 99, 99B, 105, 106B, 106, 107, 108, 109B, 110B, 110-111, 112, 113B, 114B, 114, 115, 115B, 119**Topic 7:** 154B, 154-155, 155B**N.FL.04.11 Divide numbers up to four-digits by one-digit numbers and by 10.****Topic 4:** 82B, 82-83, 83B, 84B, 94-85, 85B**Topic 8:** 164B, 164-165, 165B, 168B, 168-169, 169B, 170B, 170-171, 172, 173, 173B, 174B, 174-176, 177B, 178B, 178-179, 179B, 180B, 180-181, 182B**N.FL.04.12 Find the value of the unknowns in equations such as  $a \div 10 = 25$ ;  $125 \div b = 25$ .**\***Topic 4:** 80, 81B, 84, 85, 85B, 88, 89B**Topic 8:** 164, 165B**Topic 18:** 436B, 436-437, 437B**N.MR.04.13 Use the relationship between multiplication and division to simplify computations and check results.****Topic 4:** 80B, 80-81, 81B, 82B, 82, 83, 84B, 84, 85, 85B**Topic 8:** 174, 175, 176, 181

***N.MR.04.14 Solve contextual problems involving whole number multiplication and division.\******Topic 3:** 58, 59, 59B, 60, 61, 62B, 62, 63, 63B, 64, 65, 66, 67, 67B, 68B, 68-69, 69B**Topic 4:** 82B, 82, 83, 83B, 84B, 84, 85, 85B, 86B, 86, 87, 88, 89B**Topic 5:** 97, 97B, 98B, 99, 102, 103, 104, 105B, 106B, 107, 108, 109B, 110B, 110, 111, 112, 113B, 114B, 114, 115, 115B, 116B, 116, 117, 118, 119, 119B**Topic 7:** 142B, 142, 143, 143B, 146, 147, 149, 149B, 150B, 151, 151B, 152B, 152, 153, 153B, 154, 155, 155B**Topic 8:** 164B, 164, 165, 165B, 168B, 168, 169, 169B, 170B, 170, 171, 172, 173, 173B, 174B, 174, 175, 176, 176B, 178B, 178, 179, 179B, 180B, 180, 181, 181B**Read, interpret and compare decimal fractions****N.ME.04.15 Read and interpret decimals up to two decimal places; relate to money and place value decomposition.****Topic 1:** 16B, 16-17**Topic 12:** 268B, 268-269, 269B**N.ME.04.16 Know that terminating decimals represents fractions whose denominators are 10, 10 x 10, 10 x 10 x 10, etc., e.g., powers of 10.****Topic 12:** 274B, 274, 275, 275B**N.ME.04.17 Locate tenths and hundredths on a number line.****Topic 12:** 276B, 276-277, 278, 279B, 280B, 280-281, 281B**N.ME.04.18 Read, write, interpret, and compare decimals up to two decimal places.****Topic 12:** 268B, 268-269, 269B, 270B, 270-271, 272, 273B**N.MR.04.19 Write tenths and hundredths in decimal and fraction forms, and know the decimal equivalents for halves and fourths.****Topic 12:** 274B, 274-275, 276B**Understand fractions****N.ME.04.20 Understand fractions as parts of a set of objects.****Topic 10:** 216, 217, 218, 219**N.MR.04.21 Explain why equivalent fractions are equal, using models such as fraction strips or the number line for fractions with denominators of 12 or less, or equal to 100.****Topic 10:** 224B, 224-225, 225B, 226, 227B, 228B, 228-229, 229B, 241

**N.MR.04.22** *Locate fractions with denominators of 12 or less on the number line; include mixed numbers.\**

Topic 12: 276B, 276, 277, 278, 279B

**N.MR.04.23** Understand the relationships among halves, fourths, and eighths and among thirds, sixths, and twelfths.

Topic 10: 224B, 224, 225, 226, 227B, 228B, 228, 229, 229B, 241

**N.ME.04.24** *Know that fractions of the form  $m/n$  where  $m$  is greater than  $n$ , are greater than 1 and are called improper fractions; locate improper fractions on the number line.\**

Topic 10: 230B, 230, 231, 232, 233B

**N.MR.04.25** Write improper fractions as mixed numbers, and understand that a mixed number represents the number of “wholes” and the part of a whole remaining, e.g.,  $5/4 = 1 + 1/4 = 1 \frac{1}{4}$ .

Topic 10: 230B, 230, 231, 232, 233B

**N.MR.04.26** Compare and order up to three fractions with denominators 2, 4, and 8, and 3, 6, and 12, including improper fractions and mixed numbers.

Topic 10: 236B, 236-237, 237B

### Add and subtract fractions

**N.MR.04.27** *Add and subtract fractions less than 1 with denominators through 12 and/or 100, in cases where the denominators are equal or when one denominator is a multiple of the other, e.g.,  $1/12 + 5/12 = 6/12$  ;  $1/6 + 5/12 = 7/12$  ;  $3/10 - 23/100 = 7/100$  . \**

Topic 11: 250B, 250-251, 252, 253B, 254, 255, 255B, 256B, 256, 257, 257B

**N.MR.04.28** *Solve contextual problems involving sums and differences for fractions where one denominator is a multiple of the other (denominators 2 through 12, and 100).\**

Topic 11: 250B, 251, 252, 253, 254B, 254, 255, 255B, 256B, 256, 257, 257B, 258B, 258-259, 260, 261B

**N.MR.04.29** *Find the value of an unknown in equations such as  $1/8 + x = 5/8$  or  $3/4 - y = 1/2$  . \**

Topic 11: 258, 259, 261B

**Multiply fractions by whole numbers**

**N.MR.04.30** Multiply fractions by whole numbers, using repeated addition and area or array models.

**Topic 10:** 214B

Also see Grade 5:

**Topic 11:** 278B, 278-279, 279B

**Add and subtract decimal fractions**

**N.MR.04.31** *For problems that use addition and subtraction of decimals through hundredths, represent with mathematical statements and solve.\**

**Topic 13:** 296, 297, 298, 300B, 300, 301, 302, 304B

**N.FL.04.32** *Add and subtract decimals through hundredths.\**

**Topic 13:** 296B, 296-297, 298

**Multiply and divide decimal fractions**

**N.FL.04.33** Multiply and divide decimals up to two decimal places by a one-digit whole number where the result is a terminating decimal, e.g.,  $0.42 \div 3 = 0.14$ , but not  $5 \div 3 = 1.6$ .

**Topic 13:** 304B, 304, 305, 305B, 306B, 306, 307, 307B

**Estimate**

**N.FL.04.34** Estimate the answers to calculations involving addition, subtraction, or multiplication.

**Topic 2:** 32B, 32-33, 33B

**Topic 5:** 100B, 100-101, 101B

**Topic 7:** 144B, 144-145, 145B

**Topic 8:** 166B, 166-167, 167B

**Topic 13:** 294B, 294-295, 295B

**N.FL.04.35** Know when approximation is appropriate and use it to check the reasonableness of answers; be familiar with common place-value errors in calculations.

**Topic 5:** 102B, 102-103, 104, 105B

**N.FL.04.36** Make appropriate estimations and calculations fluently with whole numbers using mental math strategies.

**Topic 2:** 28B, 28-29, 30, 31B, 32B, 32-33, 33B

**Topic 5:** 98B, 98-99, 99B, 100B, 100-101, 101B, 105

**Topic 7:** 142B, 142-143, 143B, 144B, 144-145, 145B

**Topic 8:** 164B, 164-165, 165B, 166B, 166-167, 167B

## MEASUREMENT

### Measure using common tools and appropriate units

**M.UN.04.01 Measure using common tools and select appropriate units of measure.**

**Topic 16:** 364B, 364, 365, 365B, 367, 367B, 369, 369B, 374B, 374, 375, 375B, 377, 377B, 379, 379B

**M.PS.04.02 Give answers to a reasonable degree of precision in the context of a given problem.**

**Topic 16:** 364B, 364, 365, 365B, 367, 367B, 369, 369B, 375, 375B, 377, 377B, 379, 379B

**M.UN.04.03 Measure and compare integer temperatures in degrees.**

**Topic 16:** 390B, 390-391, 391B

**M.TE.04.04 Measure surface area of cubes and rectangular prisms by covering and counting area of the faces.**

**Topic 14:** 318B, 318-319, 319B

**Topic 15:** 347, 348, 349B

Also see Grade 5:

**Topic 13:** 328B, 328-329, 329B

### Convert measurement units

**M.TE.04.05 Carry out the following conversions from one unit of measure to a larger or smaller unit of measure: meters to centimeters, kilograms to grams, liters to milliliters, hours to minutes, minutes to seconds, years to months, weeks to days, feet to inches, ounces to pounds (using numbers that involve only simple calculations).**

**Topic 16:** 370, 370-371, 372, 373B, 380, 380-381, 382, 383B

### Use perimeter and area formulas

**M.TE.04.06 Know and understand the formulas for perimeter and area of a square and a rectangle; calculate the perimeters and areas of these shapes and combinations of these shapes using the formulas.**

**Topic 14:** 318B, 318-319, 319B, 320B, 320-321, 322, 323B, 328B, 328-329, 330, 331B



**M.TE.04.07 Find one dimension of a rectangle given the other dimension and its perimeter or area.**

**Topic 14:** 319, 319B, 330

**M.TE.04.08 Find the side of a square given its perimeter or area.**

**Topic 14:** 319B

Also see Grade 5:

**Topic 12:** 303B, 305B

**M.PS.04.09 Solve contextual problems about perimeter and area of squares and rectangles in compound shapes.**

**Topic 14:** 320, 321, 322, 323B, 328B, 328, 329, 330, 331B

### Understand right angles

**M.TE.04.10 Identify right angles and compare angles to right angles.**

**Topic 9:** 198B, 198, 199, 199B

### Problem-solving

**M.PS.04.11 Solve contextual problems about surface area.**

**Topic 14:** 318B, 318, 319, 319B

Also see Grade 5:

**Topic 13:** 328B, 328-329, 329B

### GEOMETRY Understand perpendicular, parallel, and intersecting lines

**G.GS.04.01 Identify and draw perpendicular, parallel, and intersecting lines using a ruler and a tool or object with a square (90°) corner.**

**Topic 9:** 196B, 196, 197, 197B

### Identify basic geometric shapes and their components, and solve problems

**G.GS.04.02 Identify basic geometric shapes including isosceles, equilateral, and right triangles, and use their properties to solve problems.**

**Topic 9:** 202B, 202-203, 203B, 204B, 204-205, 205B, 206B, 206-207, 207B

**G.SR.04.03 Identify and count the faces, edges, and vertices of basic three-dimensional geometric solids including cubes, rectangular prisms, and pyramids; describe the shape of their faces.**

**Topic 15:** 346B, 346-347, 348, 349, 349B, 350B, 350-351, 351B

## GEOMETRY

### Recognize symmetry and transformations

**G.TR.04.04 Recognize plane figures that have line symmetry.**

**Topic 19:** 456B, 456-457, 457B

**G.TR.04.05 Recognize rigid motion transformations (flips, slides, turns) of a two-dimensional object.**

**Topic 19:** 448B, 448-449, 449B, 450B, 450-451, 451B, 452B, 452-453, 453B

## DATA AND PROBABILITY

### Represent and solve problems for given data

**D.RE.04.01 Construct tables and bar graphs from given data.**

**Topic 17:** 402B, 402-403, 403B, 405B, 420B, 420-421, 422, 423, 423B

**D.RE.04.02 Order a given set of data, find the median, and specify the range of values.**

**Topic 17:** 402B, 402-403, 403B, 404B, 404-405, 405B, 414B, 414, 415, 415B

**D.RE.04.03 Solve problems using data presented in tables and bar graphs, e.g., compare data represented in two bar graphs and read bar graphs showing two data sets.**

**Topic 17:** 402B, 402-403, 403B, 404B, 404-405, 405B, 420B, 420-421, 422, 423, 423B

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Michigan Grade Level Content Expectations—Mathematics  
Grade Five**

**NUMBER AND OPERATIONS**

**Understand division of whole numbers**

**N.MR.05.01 Understand the meaning of division of whole numbers with and without remainders; relate division to fractions and to repeated subtraction.**

**Topic 4:** 84B, 84-85, 85B, 90, 90-91, 92, 93B, 94-95, 97B, 98B, 98-99, 101B, 110, 111, 113, 113B

**Topic 5:** 122B, 122, 123, 123B, 128, 129, 129B, 130B, 130-131, 132, 133B, 134B, 134, 135, 135B

**N.MR.05.02 Relate division of whole numbers with remainders to the form  $a = bq + r$ , e.g.,  $34 \div 5 = 6 \text{ r } 4$ , so  $5 \cdot 6 + 4 = 34$ ; note remainder (4) is less than divisor (5).**

**Topic 4:** 88B, 88, 89, 89B, 90B, 90, 91, 94, 95, 97B, 99, 101B, 110, 111, 113, 113B

**Topic 5:** 128B, 128, 129, 129B, 130B, 130, 131, 132, 133B, 134B, 134, 135, 135B

**N.MR.05.03 Write mathematical statements involving division for given situations.**

**Topic 4:** 87, 89, 92, 96, 100, 101, 111, 112, 113B

**Topic 5:** 123, 127, 139

**Multiply and divide whole numbers**

**N.FL.05.04 Multiply a multi-digit number by a two-digit number; recognize and be able to explain common computational errors such as not accounting for place value.**

**Topic 3:** 60B, 60, 61, 61B, 68B, 68-69, 69B, 70B, 70-71, 71B

***N.FL.05.05 Solve applied problems involving multiplication and division of whole numbers.\****

**Topic 3:** 60B, 61, 61B, 64B, 64, 66, 67B, 68B, 68, 69, 69B, 70B, 71, 71B, 74B, 74, 75, 76, 77B

**Topic 4:** 84B, 84, 85, 85B, 90B, 90, 91, 92, 93B, 94B, 96, 97B, 98B, 99, 100, 101, 101B, 110B, 110, 111, 112, 113B

**Topic 5:** 122B, 123, 123B, 128B, 129, 129B, 130B, 132, 133B, 134B, 135, 135B, 136B, 137

**N.FL.05.06 Divide fluently up to a four-digit number by a two-digit number.**

**Topic 4:** 84B, 84-85, 85B, 90, 90-91, 92, 93B, 94-95, 97B, 98B, 98-99, 101B, 110, 111, 113, 113B

**Topic 5:** 122B, 122, 123, 123B, 128, 129, 129B, 130B, 130-131, 132, 133B, 134B, 134, 135, 135B

### Find prime factorizations of whole numbers

**N.MR.05.07 Find the prime factorization of numbers from 2 through 50, express in exponential notation, e.g.,  $24 = 2^3 \times 3^1$ , and understand that every whole number greater than 1 is either prime or can be expressed as a product of primes.\***

**Topic 4:** 106B, 106-107, 108, 109B

### Understand meaning of decimal fractions and percentages

**N.ME.05.08 Understand the relative magnitude of ones, tenths, and hundredths and the relationship of each place value to the place to its right, e.g., one is 10 tenths, one tenth is 10 hundredths.**

**Topic 1:** 10B, 10-11, 11B

**N.ME.05.09 Understand percentages as parts out of 100, use % notation, and express a part of a whole as a percentage.**

**Topic 16:** 398B, 398-399, 399B, 402B, 402-403, 403B

### Understand fractions as division statements; find equivalent fractions

**N.ME.05.10 Understand a fraction as a statement of division, e.g.,  $2 \div 3 = 2/3$ , using simple fractions and pictures to represent.**

**Topic 9:** 224B, 224-225, 225B

**N.ME.05.11 Given two fractions, e.g.,  $1/2$  and  $1/4$ , express them as fractions with a common denominator, but not necessarily a least common denominator, e.g.,  $1/2 = 4/8$  and  $3/4 = 6/8$ ; use denominators less than 12 or factors of 100.\***

**Topic 10:** 262B, 262, 263, 263B, 264B, 264, 265, 265B

**Multiply and divide fractions**

***N.ME.05.12 Find the product of two unit fractions with small denominators using an area model.\****

**Topic 11:** 280B, 280-281, 283B

***N.MR.05.13 Divide a fraction by a whole number and a whole number by a fraction, using simple unit fractions.\****

**Topic 11:** 286B, 286-287, 287B, 288B, 288, 289, 289B

**Add and subtract fractions using common denominators**

***N.FL.05.14 Add and subtract fractions with unlike denominators through 12 and/or 100, using the common denominator that is the product of the denominators of the 2 fractions, e.g.,  $\frac{3}{8} + \frac{7}{10}$  : use 80 as the common denominator.\****

**Topic 10:** 262B, 262-263, 263B, 264B, 264-265, 265B, 266B, 266-267, 267B, 268B, 268-269, 269B

**Multiply and divide by powers of ten**

***N.MR.05.15 Multiply a whole number by powers of 10: 0.01, 0.1, 1, 10, 100, 1,000; and identify patterns.***

**Topic 3:** 60B, 60, 61, 61B

***N.FL.05.16 Divide numbers by 10's, 100's, 1,000's using mental strategies.***

**Topic 5:** 122B, 122, 129

**Topic 7:** 178B, 178-179, 179B

***N.MR.05.17 Multiply one-digit and two-digit whole numbers by decimals up to two decimal places.***

**Topic 7:** 172, 173, 173B

**Solve applied problems with fractions**

***N.FL.05.18 Use mathematical statements to represent an applied situation involving addition and subtraction of fractions.\****

**Topic 10:** 258, 263, 265, 265B

**N.MR.05.19** *Solve contextual problems that involve finding sums and differences of fractions with unlike denominators using knowledge of equivalent fractions.\**

**Topic 10:** 262B, 262, 263, 263B, 264B, 264, 265, 265B, 266B, 267, 267B, 268B, 269, 269B

**N.FL.05.20** *Solve applied problems involving fractions and decimals; include rounding of answers and checking reasonableness.\**

**Topic 2:** 42B, 42, 43, 43B, 44B, 44, 45, 45B, 46B, 47, 48, 49B

**Topic 7:** 170B, 170, 171, 171B, 172B, 172, 173, 173B, 174, 175, 175B, 176B, 176, 177, 177B, 178B, 178, 179, 179B, 180B, 180, 181, 182, 183B, 184B, 184, 185, 185B, 186B, 186, 187, 187B, 188B, 188-189, 190, 191B

**Topic 10:** 256B, 256, 257, 258, 259B, 262B, 262, 263, 263B, 264B, 264, 265, 265B, 267, 267B, 268B, 269, 269B

**Topic 11:** 278B, 278, 279, 279B, 281, 282, 283B, 284B, 284, 285, 285B, 286B, 286, 287, 287B, 288B, 288, 289, 289B

**N.MR.05.21** *Solve for the unknown in equations such as  $1/4 + x = 7/12$ .\**

**Topic 15:** 376B

Also see Grade 6:

**Topic 7:** 169

**Express, interpret, and use ratios; find equivalences**

**N.MR.05.22** **Express fractions and decimals as percentages and vice versa.**

**Topic 16:** 400B, 400-401, 401B

**N.ME.05.23** **Express ratios in several ways given applied situations, e.g., 3 cups to 5 people, 3: 5, 3/5; recognize and find equivalent ratios.**

**Topic 16:** 396B, 396-397, 397B, 398B, 398

## MEASUREMENT

**Know, and convert among, measurement units within a given system**

**M.UN.05.01** **Recognize the equivalence of 1 liter, 1,000 ml and 1,000 cm<sup>3</sup> and include conversions among liters, milliliters, and cubic centimeters.**

**Topic 14:** 350B, 350, 351, 351B

**M.UN.05.02** **Know the units of measure of volume: cubic centimeter, cubic meter, cubic inches, cubic feet, cubic yards, and use their abbreviations (cm<sup>3</sup>, m<sup>3</sup>, in<sup>3</sup>, ft<sup>3</sup>, yd<sup>3</sup>).**

**Topic 13:** 332B, 332, 333, 334, 335B

Also see Grade 6:

**Topic 18:** 463

**M.UN.05.03 Compare the relative sizes of one cubic inch to one cubic foot, and one cubic centimeter to one cubic meter.**

**Topic 13:** 332B, 332, 333, 334, 335B

Also see Grade 6:

**Topic 18:** 463

**M.UN.05.04 Convert measurements of length, weight, area, volume, and time within a given system using easily manipulated numbers.**

**Topic 14:** 348B, 349, 349B, 350B, 350, 351, 351B, 352, 353B, 354B, 354-355, 355B, 356B, 356-357, 357B

### Find areas of geometric shapes using formulas

**M.PS.05.05 Represent relationships between areas of rectangles, triangles, and parallelograms using models.**

**Topic 12:** 306B, 306-307, 307B, 308B, 308-309, 309B

**M.TE.05.06 Understand and know how to use the area formula of a triangle:  $A = \frac{1}{2}bh$  (where  $b$  is length of the base and  $h$  is the height), and represent using models and manipulatives.**

**Topic 12:** 308B, 308-309, 309B

**M.TE.05.07 Understand and know how to use the area formula for a parallelogram:**

**$A = bh$ , and represent using models and manipulatives.**

**Topic 12:** 306B, 306-307, 307B

### Understand the concept of volume

**M.TE.05.08 Build solids with unit cubes and state their volumes.**

**Topic 13:** 332B, 332, 333, 335B, 340, 341B

**M.TE.05.09 Use filling (unit cubes or liquid), and counting or measuring to find the volume of a cube and rectangular prism.**

**Topic 13:** 332B, 332, 333, 335B, 340, 341B

**Topic 14:** 348B, 348, 349, 349B, 350B, 350, 351, 351B

**M.PS.05.10 Solve applied problems about the volumes of rectangular prisms using multiplication and division and using the appropriate units.**

**Topic 13:** 333, 334, 335

**GEOMETRY****Know the meaning of angles, and solve problems**

**G.TR.05.01 Associate an angle with a certain amount of turning; know that angles are measured in degrees; understand that  $90^\circ$ ,  $180^\circ$ ,  $270^\circ$ , and  $360^\circ$  are associated respectively, with  $1/4$ ,  $1/2$ , and  $3/4$ , and full turns.**

**Topic 8:** 204B, 204, 205, 205B

**G.GS.05.02 Measure angles with a protractor and classify them as acute, right, obtuse, or straight.**

**Topic 8:** 204B, 204, 205, 205B

**G.GS.05.03 Identify and name angles on a straight line and vertical angles.**

**Topic 8:** 204, 205, 205B

Also see Grade 6:

**Topic 11:** 270B, 270, 271, 272, 273, 273B

**G.GS.05.04 Find unknown angles in problems involving angles on a straight line, angles surrounding a point, and vertical angles.**

**Topic 8:** 204B, 204, 205, 205B

**G.GS.05.05 Know that angles on a straight line add up to  $180^\circ$  and angles surrounding a point add up to  $360^\circ$ ; justify informally by “surrounding” a point with angles.**

**Topic 8:** 204B, 204, 205, 205B

**G.GS.05.06 Understand why the sum of the interior angles of a triangle is  $180^\circ$  and the sum of the interior angles of a quadrilateral is  $360^\circ$ , and use these properties to solve problems.**

**Topic 8:** 208, 209, 209B, 210, 211, 211B

**Solve problems about geometric shapes**

**G.GS.05.07 Find unknown angles and sides using the properties of: triangles, including right, isosceles, and equilateral triangles; parallelograms, including rectangles and rhombuses; and trapezoids.**

**Topic 8:** 208B, 208, 209, 209B, 210B, 210, 211, 211B



**DATA AND PROBABILITY****Construct and interpret line graphs**

**D.RE.05.01** Read and interpret line graphs, and solve problems based on line graphs, e.g., distance-time graphs, and problems with two or three line graphs on same axes, comparing different data.

**Topic 18:** 436B, 436, 437, 438, 439, 439B, 454B, 454, 455, 455B

**D.RE.05.02** Construct line graphs from tables of data; include axis labels and scale.

**Topic 18:** 436B, 437, 438, 439, 439B, 455B

**Find and interpret mean and mode for a given set of data**

**D.AN.05.03** Given a set of data, find and interpret the mean (using the concept of fair share) and mode.

**Topic 18:** 452B, 452, 453, 453B

**D.AN.05.04** Solve multi-step problems involving means.

**Topic 18:** 452B, 452, 453, 453B

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**NUMBER AND OPERATIONS**

**Multiply and divide fractions**

**N.MR.06.01 Understand division of fractions as the inverse of multiplication, e.g., if  $4/5 \div 2/3 = \square$ , then  $2/3 \cdot \square = 4/5$ , so  $\square = 4/5 \cdot 3/2 = 12/10$ .**

**Topic 9:** 204B, 204-205, 205B, 206-207, 207B

**N.FL.06.02 Given an applied situation involving dividing fractions, write a mathematical statement to represent the situation.**

**Topic 9:** 202B, 202, 203, 203B, 206B, 207, 210B, 212B, 213, 213B

**N.MR.06.03 Solve for the unknown in equations such as  $1/4 \div \square = 1$ ,  $3/4 \div \square = 1/4$ , and  $1/2 = 1 \cdot \square$ .**

**Topic 9:** 212B, 212-213, 213B

**N.FL.06.04 Multiply and divide any two fractions, including mixed numbers, fluently.**

**Topic 8:** 190B, 190-191, 191B, 192B, 192-193, 193B

**Topic 9:** 202B, 202-203, 203B, 204B, 204-205, 205B, 206B, 206-207, 207B, 210B, 210-211, 211B, 212B, 212-213, 213B

**Represent rational numbers as fractions or decimals**

**N.ME.06.05 Order rational numbers and place them on the number line.**

**Topic 1:** 8B, 8-9, 9B, 22B, 22-23, 23B

**Topic 5:** 128B, 128-129, 130, 131

**Topic 6:** 148B, 148-149, 149B, 150B, 150-151, 152, 153B

**N.ME.06.06 Represent rational numbers as fractions or terminating decimals when possible, and translate between these representations.**

**Topic 1:** 14B, 14-15, 16, 17, 17B

**Topic 5:** 128B, 128-129, 130, 131B

**Topic 6:** 146B, 146-147, 147B

**N.ME.06.07 Understand that a fraction or a negative fraction is a quotient of two integers, e.g.,  $-8/3$  is  $-8$  divided by  $3$ .**

**Topic 6:** 144B, 144-145, 145B

**Add and subtract integers and rational numbers**

***N.MR.06.08 Understand integer subtraction as the inverse of integer addition. Understand integer division as the inverse of integer multiplication.\****

**Topic 10:** 234B, 234-235, 236, 237B, 240B, 240-241, 241B

**N.FL.06.09 Add and multiply integers between -10 and 10; subtract and divide integers using the related facts. Use the number line and chip models for addition and subtraction.\***

**Topic 10:** 230B, 230-231, 232, 233, 233B, 234B, 234-235, 236, 237B, 238B, 238-239, 239B, 240B, 240-241, 241B

**N.FL.06.10 Add, subtract, multiply and divide positive rational numbers fluently.**

**Topic 3:** 64B, 64-65, 65B, 70B, 70-71, 72, 73, 73B, 74B, 74-75, 75B, 76B, 76-77, 77B, 78B, 78-79, 79B

**Topic 7:** 162B, 162-163, 163B, 166B, 166-167, 168, 169B, 172B, 172-173, 173B, 174B, 174-175, 176, 177B

**Topic 8:** 186B, 186-187, 187B, 190B, 190-191, 191B, 192B, 192-193, 193B

**Topic 9:** 202B, 202-203, 203B, 204B, 204-205, 205B, 206B, 206-207, 207B, 210B, 210-211, 211B

**Find equivalent ratios**

**N.ME.06.11 Find equivalent ratios by scaling up or scaling down.**

**Topic 12:** 302B, 302-303, 304, 305, 305B

**Solve decimal, percentage and rational number problems**

**N.FL.06.12 Calculate part of a number given the percentage and the number.**

**Topic 14:** 354B, 354-355, 356, 357, 357B

**N.MR.06.13 Solve contextual problems involving percentages such as sales taxes and tips.\***

**Topic 14:** 354B, 356, 357, 357B, 358B, 358-359, 360, 361, 361B, 362B, 362-363, 363B

**N.FL.06.14 For applied situations, estimate the answers to calculations involving operations with rational numbers.**

**Topic 3:** 62B, 62-63, 63B, 64, 65, 66B, 66-67, 68, 69, 69B, 74, 75, 76, 77, 78, 79

**Topic 7:** 170B, 170, 171, 171B, 172, 173, 174B, 174, 175

**Topic 8:** 188B, 188-189, 189B, 192, 193

**Topic 9:** 208B, 208-209, 209B, 210, 211

**N.FL.06.15 Solve applied problems that use the four operations with appropriate decimal numbers.**

**Topic 3:** 64B, 64, 65, 65B, 70B, 70, 71, 72, 73B, 74B, 74, 75, 75B, 76B, 76, 77, 77B, 78B, 78, 79, 79B, 84B, 84-85, 86, 87B

## Use exponents

**N.ME.06.16 Understand and use integer exponents, excluding powers of negative bases; express numbers in scientific notation.\***

**Topic 1:** 10B, 10, 11, 12, 13B

**Topic 3:** 82B, 82-83, 83B

## Understand rational numbers and their location on the number line

**N.ME.06.17 Locate negative rational numbers (including integers) on the number line; know that numbers and their negatives add to 0, and are on opposite sides and at equal distance from 0 on a number line.**

**Topic 10:** 222, 222-223, 223B, 224B, 224, 225, 225B, 226B, 226-227, 228, 229B

**N.ME.06.18 Understand that rational numbers are quotients of integers (non zero denominators), e.g., a rational number is either a fraction or a negative fraction.**

**Topic 5:** 128B, 128-129, 130, 131

**Topic 6:** 144B, 144-145, 145B

**Topic 10:** 226B, 226-227, 228, 229B

**N.ME.06.19 Understand that 0 is an integer that is neither negative nor positive.**

**Topic 10:** 222B, 222, 223, 223B

**N.ME.06.20 Know that the absolute value of a number is the value of the number ignoring the sign; or is the distance of the number from 0.**

**Topic 10:** 223, 223B, 224, 225, 225B

## ALGEBRA

### Calculate rates

**A.PA.06.01 Solve applied problems involving rates, including speed, e.g., if a car is going 50 mph, how far will it go in 3 1/2 hours?**

**Topic 12:** 306B, 306-307, 307B, 308B, 308-309, 309B, 310B, 310-311, 312, 313, 313B, 315

**Understand the coordinate plane**

**A.RP.06.02 Plot ordered pairs of integers and use ordered pairs of integers to identify points in all four quadrants of the coordinate plane.**

**Topic 10:** 246B, 246-247, 248, 249, 249B

**Use variables, write expressions and equations, and combine like terms**

**A.FO.06.03 Use letters, with units, to represent quantities in a variety of contexts, e.g., y lbs., k minutes, x cookies.**

**Topic 2:** 32B, 33, 33B, 46B, 47, 47B, 48B, 49, 49B, 50B, 50, 51, 52, 53B, 98B, 99, 100, 101B, 102B, 102, 103, 104, 105B, 106B, 107, 108, 110B, 110, 111, 112, 113B

**A.FO.06.04 Distinguish between an algebraic expression and an equation.**

**Topic 2:** 32B, 32-33, 33B, 48B, 48-49, 49B, 50B, 50-51, 52, 53, 53B

**Topic 4:** 96B, 96-97, 97B, 102B, 102-103, 104B 105B, 110B, 110-111, 112, 113B

**A.FO.06.05 Use standard conventions for writing algebraic expressions, e.g.,  $2x + 1$  means “two times x, plus 1” and  $2(x + 1)$  means “two times the quantity  $(x + 1)$ .”**

**Topic 2:** 32B, 32-33, 33B, 34B, 46B, 46, 47, 47B, 48B, 48, 49, 49, 50B, 50, 51, 52, 53, 53B

**A.FO.06.06 Represent information given in words using algebraic expressions and equations.**

**Topic 2:** 32B, 32-33, 33B, 34B, 46B, 46, 47, 47B, 48B, 48, 49, 49B, 50B, 50, 51, 52, 53, 53B

**Topic 4:** 98B, 99, 102B, 102-103, 104, 105B, 106B, 107, 108, 109B, 110B, 110-111, 112, 113B

**Topic 9:** 212B, 213

**Topic 10:** 242B, 243, 244, 245B

**Topic 15:** 372, 373, 375B, 376B, 376-377, 377B, 378B, 379, 379B

**A.FO.06.07 Simplify expressions of the first degree by combining like terms, and evaluate using specific values.**

**Topic 2:** 36B, 46B, 46-47, 47B

**Represent linear functions using tables, equations, and graphs**

**A.RP.06.08 Understand that relationships between quantities can be suggested by graphs and tables.**

**Topic 2:** 46B, 46-47, 47B, 48B, 48-49, 49B, 50B, 50-51, 52, 53, 53B

**Topic 12:** 310B, 311

**Topic 15:** 376B, 376-377, 377B, 378B, 378-379, 379B, 380B, 380-381, 381B, 382B, 382-383, 384, 385, 385B, 386B, 386, 387, 388, 389B, 390B, 390, 391, 391B

***A.PA.06.09 Solve problems involving linear functions whose input values are integers; write the equation; graph the resulting ordered pairs of integers, e.g., given  $c$  chairs, the “leg function” is  $4c$ ; if you have 5 chairs, how many legs?; if you have 12 legs, how many chairs?\****

**Topic 2:** 46B, 46-47, 47B, 48B, 48-49, 49B, 50B, 50-51, 52, 53, 53B

**Topic 12:** 310B, 310-311, 312, 313, 313B, 315

**Topic 15:** 376B, 376-377, 377B, 378B, 379, 379B, 381, 382, 383, 384, 386B, 386, 387, 388 390B, 390, 391, 391B

**A.RP.06.10 Represent simple relationships between quantities using verbal descriptions, formulas or equations, tables, and graphs, e.g., perimeter-side relationship for a square, distance-time graphs, and conversions such as feet to inches.**

**Topic 2:** 46B, 46-47, 47B, 48B, 48-49, 49B, 50B, 50-51, 52, 53, 53B

**Topic 12:** 310B, 310-311, 312, 313, 313B, 315

**Topic 15:** 376B, 376-377, 377B, 378B, 379, 379B, 381, 382, 383, 384, 386B, 386, 387, 388 390B, 390, 391, 391B

**Solve equations**

***A.FO.06.11 Relate simple linear equations with integer coefficients, e.g.,  $3x = 8$  or  $x + 5 = 10$ , to particular contexts and solve.\****

**Topic 4:** 98B, 98-99, 100, 101B, 106B, 106-107, 108, 109B

**A.FO.06.12 Understand that adding or subtracting the same number to both sides of an equation creates a new equation that has the same solution.**

**Topic 4:** 96B, 96-97, 97B

**A.FO.06.13 Understand that multiplying or dividing both sides of an equation by the same non-zero number creates a new equation that has the same solutions.**

**Topic 4:** 96-97, 97B

**A.FO.06.14 Solve equations of the form  $ax + b = c$ , e.g.,  $3x + 8 = 15$  by hand for positive integer coefficients less than 20, use calculators otherwise, and interpret the results.**

**Topic 15:** 372B, 372-373, 374, 375B

## MEASUREMENT

### Convert within measurement systems

**M.UN.06.01 Convert between basic units of measurement within a single measurement system, e.g., square inches to square feet.**

**Topic 16:** 400B, 400-401, 402, 403B, 404B, 404-405, 406, 407, 407B

### Find volume and surface area

**M.PS.06.02 Draw patterns (of faces) for a cube and rectangular prism that, when cut, will cover the solid exactly (nets).**

**Topic 18:** 454B, 455, 456, 457B, 458B, 458 459, 461B

**M.TE.06.03 Compute the volume and surface area of cubes and rectangular prisms given the lengths of their sides, using formulas.**

**Topic 18:** 458B, 459, 461B, 462B, 462-463, 463B, 468, 469, 469B

## GEOMETRY

### Understand and apply basic properties

**G.GS.06.01 Understand and apply basic properties of lines, angles, and triangles, including:**

- **triangle inequality**

**Topic 11:** 274B, 274, 275, 276, 277B

Also see Grade 5:

**Topic 8:** 208B, 208, 209, 209B

- **relationships of vertical angles, complementary angles, supplementary angles**

**Topic 11:** 270B, 270, 271, 272, 273, 273B

- **congruence of corresponding and alternate interior angles when parallel lines — are cut by a transversal, and that such congruencies imply parallel lines**

**Topic 11:** 262, 264, 265B, 278, 279, 280

Also see Grade 5:

**Topic 8:** 200B, 200, 201, 202, 203B

- **locate interior and exterior angles of any triangle, and use the property that an exterior — angle of a triangle is equal to the sum of the remote (opposite) interior angles**

**Topic 11:** 274B, 274, 275, 276, 277B

Also see Grade 5:

**Topic 8:** 208B, 208-209, 209B

- **know that the sum of the exterior angles of a convex polygon is  $360^\circ$ .**

**Topic 11:** 274B, 274, 275, 276, 277B

Also see Grade 5:

**Topic 8:** 207, 207B, 208, 209, 209B, 210, 211, 211B

## **Understand the concept of congruence and basic transformations**

**G.GS.06.02 Understand that for polygons, congruence means corresponding sides and angles have equal measures.**

**Topic 11:** 285, 286, 287B

**G.TR.06.03 Understand the basic rigid motions in the plane (reflections, rotations, translations), relate these to congruence, and apply them to solve problems.**

**Topic 11:** 284B, 284-285, 286, 287, 287B

**G.TR.06.04 Understand and use simple compositions of basic rigid transformations, e.g., a translation followed by a reflection.**

**Topic 11:** 284B, 284, 285, 287, 287B

## **Construct geometric shapes**

**G.SR.06.05 Use paper folding to perform basic geometric constructions of perpendicular lines, midpoints of line segments and angle bisectors; justify informally.**

**Topic 11:** 260E, 270B



**DATA AND PROBABILITY****Understand the concept of probability and solve problems**

**D.PR.06.01 Express probabilities as fractions, decimals, or percentages between 0 and 1; know that 0 probability means an event will not occur and that probability 1 means an event will occur.**

**Topic 20:** 528B, 528-529, 529B, 534B, 534, 535, 535B

**D.PR.06.02 Compute probabilities of events from simple experiments with equally likely outcomes, e.g., tossing dice, flipping coins, spinning spinners, by listing all possibilities and finding the fraction that meets given conditions.**

**Topic 20:** 530B, 530, 531, 533, 533B