2016 – 2017

Grade 3

Mathematics Curriculum

Documents



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# Grade 3 Year at a Glance – Quarter 1

|  |  |
| --- | --- |
| **Unit 1: Trading Stickers, Combining Coins**  **Estimated Duration: 19 days**   * Investigation 1: 9 lessons * Investigation 2: 7 lessons (Combine 2.1 & 2.2) | **CMS Geometry Unit**  **Estimated Duration: 12 days**   * 11 Lessons |
| **Unit 3: Collections and Travel Stories**  **Estimated Duration: 28 days (12 days in Quarter 1)**   * Investigation 1: 7 lessons (Including 1.7A) * Investigation 2: 7 lessons * Investigation 3: 6 lessons (Combine 3.1-3.2) * Investigation 4: 6 lessons |

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| --- | --- | --- | --- | --- |
| **Quarter 1 (43 Days)** | | | | |
| **Monday** | **Tuesday** | **Wednesday** | **Thursday** | **Friday** |
| **August 29** | 30 | 31 | **September 1** | 2 |
| 5 | 6 | 7 | 8 | 9 |
| 12 | 13 | 14 | 15 | 16 |
| 19 | 20 | 21 | 22 | 23 |
| 26 | 27 | 28 | 29 | 30 |
| **October 3** | 4 | 5 | 6 | 7 |
| 10 | 11 | **12ER** | 13 | 14 |
| 17 | 18 | 19 | 20 | 21 |
| 24 | 25 | 26 | 27 | **28Q** |

**Calendar Key:**

|  |  |
| --- | --- |
|  | Teacher Workday |
|  | Holiday/Annual Leave |
| **ER** | Early Release Day |
| **Q** | End of Quarter |

# Grade 3 Year at a Glance – Quarter 2

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| --- | --- |
| **Unit 3: Collections and Travel Stories**  **Estimated Duration: 28 days (12 days in Quarter 1)**   * Investigation 1: 7 lessons (Including 1.7A) * Investigation 2: 7 lessons * Investigation 3: 6 lessons (Combine 3.1-3.2) * Investigation 4: 6 lessons | **Unit 5: Equal Groups**  **Estimated Duration: 29 days**   * Investigation 1: 4 lessons * Investigation 2: 6 lessons * Investigation 3: 9 lessons   (Including 3.1A, 3.5A, 3.5B, 3.7A; Skip 3.5)   * Investigation 4: 7 lessons |

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| **Quarter 2 (45 Days)** | | | | |
| **Monday** | **Tuesday** | **Wednesday** | **Thursday** | **Friday** |
| 31 | **November 1** | 2 | 3 | 4 |
| 7 | 8 | 9 | 10 | 11 |
| 14 | 15 | 16 | 17 | 18 |
| 21 | 22 | 23 | 24 | 25 |
| 28 | 29 | 30 | **December 1** | 2 |
| 5 | 6 | 7 | 8 | 9 |
| 12 | 13 | 14 | 15 | 16 |
| 19 | 20 | 21 | 22 | 23 |
| 26 | 27 | 28 | 29 | 30 |
| **January 2** | 3 | 4 | 5 | 6 |
| 9 | 10 | 11 | 12 | 13 |
| 16 | 17 | 18 | 19 | 20 |
| **23ERQ** |

**Calendar Key:**

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|  | Teacher Workday |
|  | Holiday/Annual Leave |
| **ER** | Early Release Day |
| **Q** | End of Quarter |

# Grade 3 Year at a Glance – Quarter 3

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| **CMS Unit: Linking Multiplication to Area & Graphing**  **Estimated Duration: 6 days**   * 5 lessons | **Unit 7: Finding Fair Shares**  **Estimated Duration: 20 days**   * Investigation 1: 3 lessons (Skip 1.4-1.6) * Investigation 2: 4 lessons (Including 2 Bridge Lessons, 2.7A) * Investigation 3: 0 lessons (Skip this Investigation) * CMS Number Line Lessons: 9 lessons |
| **CMS Unit: Area & Perimeter Revisited**  **Estimated Duration: 5 days**   * 5 lessons | **Unit 8: How Many Hundreds? How Many Miles?**  **Estimated Duration: 18 days (14 days in Quarter 3)**   * Investigation 1: 5 lessons * Investigation 2: 5 lessons * Investigation 3: 4 lessons (Skip 3.4, 3.5, 3.7,3.8, 3.9) * Multi-Step Problems: 4 lessons |

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| **Quarter 3 (45 Days)** | | | | |
| **Monday** | **Tuesday** | **Wednesday** | **Thursday** | **Friday** |
| **January 23ERQ** | 24 | 25 | 26 | 27 |
| 30 | 31 | **February 1** | 2 | 3 |
| 6 | 7 | 8 | 9 | 10 |
| 13 | 14 | 15 | 16 | 17 |
| 20 | 21 | 22 | 23 | 24 |
| 27 | 28 | **March 1** | 2 | 3 |
| 6 | **7ER** | 8 | 9 | 10 |
| 13 | 14 | 15 | 16 | 17 |
| 20 | 21 | 22 | 23 | 24 |
| 27 | 28 | 29 | **30Q** | 3/31 |

**Calendar Key:**

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| --- | --- |
|  | Teacher Workday |
|  | Holiday/Annual Leave |
| **ER** | Early Release Day |
| **Q** | End of Quarter |

# Grade 3 Year at a Glance – Quarter 4

|  |  |
| --- | --- |
| **Unit 8: How Many Hundreds? How Many Miles?**  **Estimated Duration: 18 days (14 days in Quarter 3)**   * Investigation 1: 5 lessons * Investigation 2: 5 lessons * Investigation 3: 4 lessons (Skip 3.4, 3.5, 3.7,3.8, 3.9) * Multi-Step Problems: 4 lessons | **CMS Unit: Measuring Liquid Volume, Mass, & Elapsed Time**  **Estimated Duration: 10 days**   * Weight: 9 lessons |
| **CMS EOG Review Unit**  **Estimated Duration: 15 days** |

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| **Quarter 4 (43 Days)** | | | | |
| **Monday** | **Tuesday** | **Wednesday** | **Thursday** | **Friday** |
| **April 3** | 4 | 5 | 6 | 7 |
| 10 | 11 | 12 | 13 | 14 |
| 14 | 18 | 19 | 20 | 21 |
| 24 | 25 | **26ER** | 27 | 28 |
| **May** **1** | 2 | 3 | 4 | 5 |
| 8 | 9 | 10 | 11 | 12 |
| 15 | 16 | 17 | 18 | 19 |
| 22 | 23 | 24 | 25 | 26 |
| 29 | 30 | 31 | **June 1** | 2 |
| 5 | 6 | 7 | 8 | **9Q** |

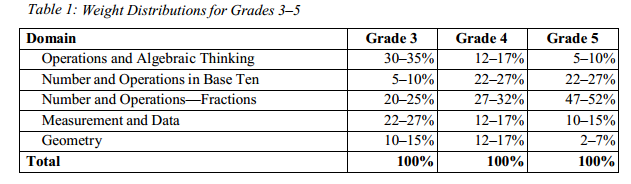
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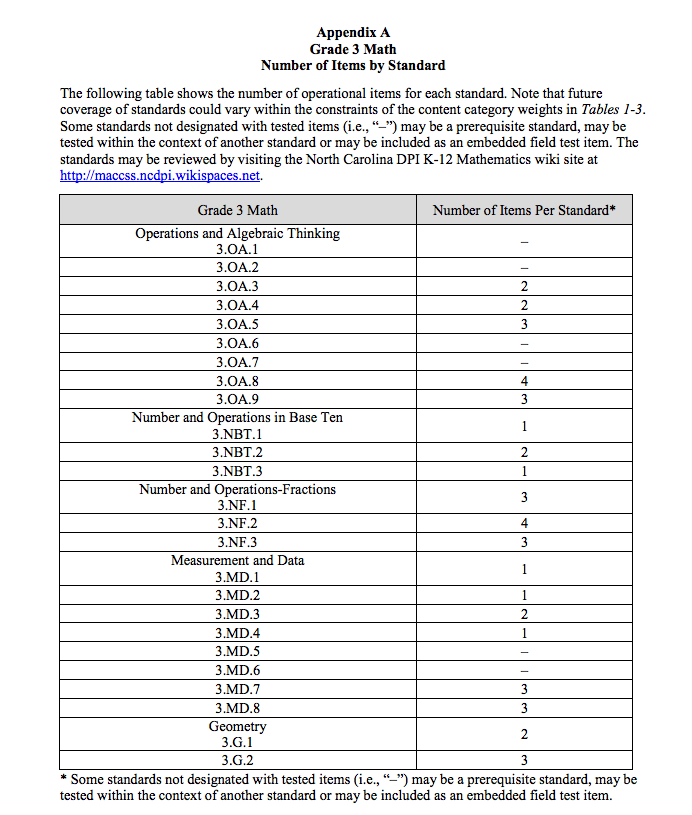
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| --- | --- |
|  | Teacher Workday |
|  | Holiday/Annual Leave |
| **ER** | Early Release Day |
| **Q** | End of Quarter |

# Grade 3 Scope and Sequence

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Unit 1** | **CMS Unit** | **Unit 3** | | **Unit 5** | **CMS Unit** | **Unit 7** | **CMS Unit** | **Unit 8** | | **CMS Unit** |
| ***Trading Stickers, Combining Coins*** | ***CMS Geometry Unit*** | ***Collections and Travel Stories*** | | ***Equal Groups*** | ***Linking Multiplication to Area and Graphing*** | ***Finding Fair Shares*** | ***Area & Perimeter Revisited*** | ***How Many Hundreds? How Many Miles?*** | | ***Measurement*** |
| Addition, Subtraction, and the Number System 1 | Geometry and Perimeter | Addition, Subtraction, and the Number System 2 | | Multiplication and Division | Area and Scaled  Pictographs  & Bar Graphs | Fractions and Decimals | Area & Perimeter | Addition, Subtraction, and the Number System 3 | | Weight, Capacity, Elapsed Time |
| 3.NBT.2  3.OA.8 | 3.G.1  3.MD.8 | 3.NBT.1  3.NBT.2  3.OA.8  3.OA.9  3.MD.1 | | 3.OA.1  3.OA.2  3.OA.3  3.OA.4  3.OA.5  3.OA.6  3.OA.7  3.OA.8  3.OA.9 | 3.MD.5  3.MD.6  3.MD.7  3.MD.3  3.G.1 | 3.NF.1  3.NF.2  3.NF.3  3.MD.1  3.MD.4  3.G.2 | 3.MD.5  3.MD.6  3.MD.7  3.MD.8 | 3.NBT.1  3.NBT.2  3.NBT.3  3.OA.8  3.OA.9 | | 3.MD.2  3.NBT.3 |
| **19 days**  *8/29 – 9//23* | **12 days**  *9/26 – 10/12* | **28 days**  *10/13 – 11/29* | | **29 days**  *11/30 – 1/23* | **6 days**  *1/25 – 2/1* | **20 days**  *2/2 – 3/3* | **5 days**  *3/6 – 3/10* | **18 days**  *3/13 – 4/6* | | **10 days**  *4/14 – 4/28* |
| **Quarter 1**  *August 29th - October 28th* | | | **Quarter 2**  *November 1st - January 23rd* | | **Quarter 3**  *January 24th - March 30th* | | | | **Quarter 4**  *March 31st - June 9th* | |
| **Percentage of Instructional Time Devoted to Each Unit** | | | | | | | | | | |
| **13%** | **8%** | **19%** | | **20%** | **4%** | **14%** | **3%** | **12%** | | **7%** |

# North Carolina End of Grade Test Specifications





# **Unit 1: Trading Stickers, Combining Coins**

*Estimated Duration: 19 days (August 29, 2016 – September 23, 2016)*

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| **Expectations for Students at the End of the Unit** | |
| **Students will know:**   * Addition is combining two or more numbers. * Subtraction is removing or taking away a part. Subtraction is also used to compare or find the difference between to numbers. * Visualizing an addition or subtraction situation can help make sense of a story problem * Addition and subtraction are inverse operations. * An equation can be used to represent a story problem. * A letter in an equation represents an unknown quantity. * Rounding is changing numbers to “friendlier” numbers to make it easier to add and subtract. * Estimation is using rounded numbers to make sure a sum or difference is close of the actual answer when an exact answer is not needed or to make sure an exact answer is close to what it should be. * We can use different strategies to add or subtract multi-digit numbers. * We use place value to add and subtract when we break numbers apart into hundreds, tens, and ones. * We can use properties of operations (commutative, associative) to add and subtract because sometimes changing the order of the numbers makes them easier to add or subtract. * We can use the inverse relationship between addition and subtraction to help us solve problems. | **Students will be able to:**   * Use more than one strategy to efficiently solve addition and subtraction word problems. * Find combinations of 2-digit numbers that equal 100. * Write equations to represent combinations of 100. * Add and subtract multiples of 10. * Explain how they solved addition and subtraction problems. * Estimate sums of 2-digit numbers up to 100. * Keep track of all parts of a word problem. * Represent problems using a letter or symbol to represent the unknown. |
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| **Investigation 1**  **Estimated Duration: 9 days** | | | |
| **Session** | **Student I Will Statements** | **Supporting Accountable Talk** | **Assessment** |
| **1.1** | * I will recognize and represent the place value of each digit in 2- and 3-digit numbers. * I will add and subtract multiples of ten. | * I used \_\_\_\_ to add or subtract tens. * I found the number \_\_\_\_ on the hundreds chart. When I added ten to that number, \_\_\_\_ happened. * When I added more strips of ten, the number changed by \_\_\_\_\_\_\_. | Student Activity Book (SAB) page 3 (Problems for Adding and Subtracting Tens) provides an understanding of how students solve addition and subtraction problems involving tens. |
| **1.2** | * I will recognize and represent the place value of each digit in 2- and 3-digit numbers. * I will add and subtract multiples of ten. * I will solve addition problems with 2-digit numbers using strategies that involve breaking numbers apart by place or adding one number in parts. | * Every time I add ten to a number of the hundreds chart, \_\_\_\_ happens. * I used the \_\_\_\_ strategy to solve the addition problem by \_\_\_\_\_\_. * I used the \_\_\_\_\_ strategy to solve the subtraction problem by \_\_\_\_\_\_\_. | SAB page 11(Adding and Subtracting 10s) provides information about strategies students use to solve addition and subtraction problems with accuracy. Pay attention to the strategies students use and if they are able to solve each problem |
| **1.3** | * I will solve addition problems with 2-digit numbers that involve more than 10 ones * I will explain the effect of adding more than 10 ones on the sum. | * I wrote this equation (\_\_\_\_\_\_) to represent the problem. * These strategies are alike because \_\_\_\_\_\_. * These strategies are different because \_\_\_\_\_\_. | SAB page 13, problem 3 (Story Problems 2) is an informal assessment of how students solve word problems by adding by place and by adding one number in parts. Pay attention to the strategies students use and if they are able to solve each of the problem types. |
| **1.4** | * I will find the difference between a 2-digit number and 100. | * I used the \_\_\_\_\_ strategy to add because \_\_\_\_\_\_\_. * The \_\_\_\_\_ strategy helped me subtract by \_\_\_\_\_\_. * The math tool I used was \_\_\_\_\_. I chose this tool because \_\_\_\_\_\_\_. | SAB page 16 (How Many More Stickers to Get 100?), problems 4a and 4b provides information on the strategies and tools that students use. See if students are able to write equations to match their strategies |
| **1.5** | * I will add and subtract multiples of ten. | * I used \_\_\_\_ combination of cards to \_\_\_\_\_\_. * I used the equation (\_\_\_\_) to show the moves that I made on the hundreds chart. * I knew to move forward/backwards on the hundreds chart because/by \_\_\_\_\_\_. * I combined the change cards \_\_\_\_, \_\_\_\_, and \_\_\_\_ to move \_\_\_\_ spaces. | As students play *Capture 5*, the ongoing assessment questions (page 63) will help to determine if students can make jumps of 10 rather than counting out 10 by 1s. If students are moving their game pieces by counting 1s, it is important to help them make moves in larger chunks. |
| **1.6** | * I will use equivalencies among pennies, dimes, and dollars. * I will add pennies and dimes to sums up to $2.00. * I will add and subtract multiples of ten. | * I traded \_\_\_\_ for \_\_\_\_ because \_\_\_\_\_\_. * Look how I figured it out on a 200 chart. * I decided to take \_\_\_\_ coins because \_\_\_\_\_. * I know I have the same amount as \_\_\_\_\_ because \_\_\_\_\_\_\_. * I used the equation (\_\_\_\_) to show my steps. | SAB page 23 (How Many More to 100? How Much More to $1.00?) will also help to determine if students are able determine the difference between 2-digit numbers and 100 or $1.00. The ongoing assessment questions on page 70 can be used to guide your conversations. |
| **1.7** | * I will add and subtract pennies and dimes to sums up to $2.00. * I will find the difference between a 2-digit number and 100. * I will add and subtract multiples of 10. | * I used \_\_\_\_ combination of cards to \_\_\_\_\_\_. * I used the equation (\_\_\_\_) to show the moves that I made on the hundreds chart. * I knew to move forward/backwards on the hundreds chart because/by \_\_\_\_\_\_. * I combined the change cards \_\_\_\_, \_\_\_\_, and \_\_\_\_ to move \_\_\_\_ spaces. | SAB page 28 (How Many More? How Much More?) will help determine how students solve story problems with missing addends. Reference the ongoing assessment questions on page 75 as you analyze student work. |
| **1.8** | * I will recognize and represent the place value of each digit in 2- and 3-digit numbers. * I will find different combinations of 100s, 10s, and 1s for a number, and recognize their equivalence. * I will recognize and demonstrate the equivalence of one 100 to ten 10s and of one 10 to ten 1s. | * There are \_\_ possible combinations for my number. * I can make my number like this… * I know I can trade \_\_\_ for \_\_\_ and keep the same number. | SAB page 33 (Flag Stickers) assesses students’ understanding of using a variety of combinations to make a number. For enrichment, you could have students make different combinations for more challenging numbers. Reference the ongoing assessment questions on page 80 as you analyze student work. |
| **1.9** | * I will find the difference between a 2-digit number and 100. * I will solve addition problems with 2-digit numbers by using strategies that involve breaking numbers apart by place or adding one number in parts. | * I chose to add the numbers using the \_\_\_\_\_\_ strategy. * I can show my work using a \_\_\_\_\_\_\_. * I found the missing addend by \_\_\_\_\_. | Resource Masters M21 and M22 (Assessment: Hundreds, Tens, and Ones) is a formal assessment of place value concepts and addition and subtraction story problems. When grading the assessment, reference pages 153-158 in the Teacher’s Manual for a suggested rubric.  You may also choose to have your students complete a performance task and/or add additional questions related to the topics covered in Investigation 1.  Suggested performance task (Task 2):  <http://3-5cctask.ncdpi.wikispaces.net/3.OA.8-3.OA.9> |

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| **Investigation 2**  **Estimated Duration: 7 days** | | | |
| **Session** | **Student I Will Statements** | **Supporting Accountable Talk** | **Assessment** |
| **2.1-2.2** | * I will use knowledge of place value to find pairs of numbers that add to 100 or close to 100. * I will find the difference between a two digit number and 100. | * I used \_\_\_\_\_\_\_\_ combinations to help figure out\_\_\_\_\_\_\_\_\_ * I notice the patterns \_\_\_\_\_\_\_\_\_\_\_ * I think this pattern occurs because \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | As students play Close to 100, use the ongoing assessment questions (page 107) to informally assess students’ understanding of combinations that equal 100. |
| **2.3** | * I will estimate the sums of 2-digit numbers by using knowledge of place value and known combinations. * I will use knowledge of place value to find pairs of 2-digit numbers that add to 100 or a number close to 100. * I will use known pairs of 2-digit numbers that add to 100 to find related pairs that add to 100 or a number close to 100. | * I looked at the \_\_\_\_ place so I know I needed to \_\_\_\_\_. * I used the\_\_\_\_\_ strategy to estimate the sums of these problems. * My place value knowledge helped me determine\_\_\_\_\_\_. | Student Activity Book (SAB) page 42 (Problems for Close to 100) provides an informal assessment opportunity for students understanding of estimating the sums of addition problems to determine if the sums are more or less than 100. Reference the ongoing assessment questions on page 107 and 112 as you analyze student work. |
| **2.4** | * I will find combinations of coins that equal $1.00. * I will recognize and demonstrate the equivalence of one 100 to ten 10s and of one 10 to ten 1s. * I will recognize and use coin equivalencies. | * I combined \_\_\_\_ and \_\_\_\_\_ because \_\_\_\_\_\_. * I used knowledge of coin equivalencies to find \_\_\_\_\_\_\_\_\_. * I see that one card is worth\_\_\_\_. I would use the coins \_\_\_ to make a dollar. | SAB page 47 (Adding Up Coins) is an assessment of students’ ability to add coin values up to $1.00 and their understanding of coin equivalencies.  As students play Make a Dollar, use the ongoing assessment questions (page 118 and 119) to informally assess students’ understanding of combinations that equal $1.00. |
| **2.5** | * I will find combinations of coins that equal $1.00. * I will use knowledge of place value to find pairs of 2-digit numbers that add to 100 or a number close to 100. * I will solve addition problems with 2-digit numbers by using strategies that involve breaking numbers apart by place or adding one number in parts. | * I am able to solve some addition combinations quickly because \_\_. * I need more practice with \_\_\_\_\_ because \_\_\_\_\_\_\_\_\_\_. | Student Activity Book (SAB) page 42 (Problems for Close to 100) provides an informal assessment opportunity for students understanding of estimating the sums of addition problems to determine if the sums are more or less than 100. Reference the ongoing assessment questions on page 107 and 112 as you analyze student work. |
| **2.6** | * I will solve addition problems with 2-digit numbers by using strategies that involve breaking numbers apart by place or adding one number in parts. * I will find different combinations of 100s, 10s, and 1s for a number and recognize that they are equivalent. | * This problem is about \_\_\_\_ * I already know\_\_\_\_ * I am trying to figure out \_\_\_\_\_\_. * I can describe how \_\_\_\_\_\_ solve this problem. The steps they used are\_\_\_\_\_\_. | SAB page 52 (Twice as Nice), problem 5 assesses student knowledge of addition strategies. Use this assessment after discussing doubles and completing problems 1-4 as guided practice. *(Make sure doubles are introduced during the discussion on story problem strategies.)* |
| **2.7** | * I will find different combinations of 100s, 10s, and 1s for a number and recognize that they are equivalent. * I will recognize and demonstrate the equivalence of one 100 to ten 10s and of one 10 to ten 1s. | * when I compare \_\_\_\_\_\_ and \_\_\_\_ combinations I noticed they are similar by \_\_\_\_\_\_ and different by \_\_\_\_. * I can show my reasoning about the numbers by explaining \_\_\_\_\_\_\_\_\_\_\_\_\_\_. * My solution demonstrates my understanding because \_\_\_\_\_\_\_\_. | SAB page 55 (Hundreds, Tens, and Ones Problems) question 2 only is an informal assessment of the content covered in Investigation 2. \*Note skip question 1 and 3. |
| **2.8** | * I will add and subtract multiples of 10. * I will solve addition problems with 2-digit numbers by using strategies that involve breaking numbers apart by place or adding one number in pairs. * I will find different combinations of 100s, 10s, and 1s for a number and recognize that they are equivalent. | * I can show my reasoning about the numbers by explaining \_\_\_\_\_\_\_\_\_\_\_\_\_\_. * My solution demonstrates my understanding because \_\_\_\_\_\_\_\_. | Resource Masters M46-M48 (End of Unit Assessment) is a formal assessment. (When grading the assessment, reference pages 164-169 in the Teacher’s Manual for a suggested rubric.) |

# **CMS Geometry Unit**

*Estimated Duration: 12 days (September 26, 2016 – October 12, 2016)*

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| **Expectations for Students at the End of the Unit** | |
| **Students will know:**   * Attributes are used to identify and group (categorize) shapes. * Triangles have 3 sides and 3 vertices. * Quadrilaterals have 4 sides and 4 vertices. * Pentagons have 5 sides and 5 vertices. * Hexagons have 6 sides and 6 vertices. * Opposite sides are across from each other. * Congruent sides are the same length. * Sometimes opposite sides will never meet or cross even if they continued beyond the shape. * Where two sides of a shape meet, there is a point or vertex. The two sides and vertex make an angle. We call some angles square because a square could fit perfectly into the angle.. * Parallelograms have two pairs of opposite sides that are the same length. Rectangles have two pairs of opposite sides that are the same length and 4 square corners. Rhombuses have 4 equal sides. Squares have 4 equal sides and 4 square corners. Trapezoids have one pair of opposite sides that are parallel and one pair that is not. * Shapes in two different categories (groups) can share an attribute. That attribute can be used to define a larger category. * Parallelograms, rectangles, rhombuses, squares, and trapezoids can be grouped in to a larger category of quadrilaterals. * Rectangles rhombuses, and squares can be grouped into the larger category of parallelograms. | **Students will be able to:**   * Describe the attributes of triangles, quadrilaterals, pentagons, hexagons, octagons, and decagons. * Describe, define, and sort quadrilaterals. * Measure and record the perimeter of polygons. * Find the perimeter of an irregular polygon. * Use attributes of shapes to find missing side lengths. * Find a side length when the perimeter is known. |
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| **CMS Geometry Unit**  **Estimated Duration: 11 days** | | | |
| **Session** | **Student I Will Statements** | **Supporting Accountable Talk** | **Assessment** |
| **1** | * I will identify the attributes of 2D shapes. * I will sort shapes using attributes. | * The attributes of my shape are \_\_\_\_. * When looking at this shape I notice \_\_\_\_\_. | Use work on Mystery Shape Sort. Do students correctly sort according to an attribute. Are students able to draw additional shapes that follow their rule? |
| **2** | * I will identify shapes by the number of sides and corners in the shape. * I will create shape with given attributes. * I will identify triangles, quadrilaterals, pentagons, hexagons, octagons and decagons. | * A quadrilateral is \_\_\_\_\_. All quadrilaterals have \_\_\_\_. (Use other shapes too) * In order to make a hexagon I had to \_\_\_\_. * In order to make a triangle I had to \_\_\_ | Use the Exit Ticket “What Shape is It?” |
| **3** | * I will describe and sort quadrilaterals using attributes. | * These two quadrilaterals are alike because both have \_\_\_\_. * These two quadrilaterals are different because \_\_\_\_. * This group of quadrilaterals all have \_\_\_\_. | Use the Exit Ticket -”Like Me, Like Me Not” to assess students’ ability to find similarities and differences between quadrilaterals. |
| **4** | * I will use a Venn diagram to sort quadrilaterals. * I will define and describe quadrilaterals. | * These quadrilaterals belong in this circle because they all \_\_\_\_ * These quadrilaterals belong in both circles because they have \_\_\_\_ and \_\_\_\_. | Use the Exit Ticket - “What’s the Rule?” to assess students’ ability to compare and contrast a variety of shapes using a Venn diagram. |
| **5** | * I will make observations about quadrilaterals. | * I know that this shape is not a square or rectangle because \_\_\_\_. * All parallelograms have these attributes \_\_\_\_\_\_. (repeat with other quadrilaterals) * If I were a \_\_\_\_\_ I would have \_\_\_ and I would have \_\_\_, but I would not have \_\_\_\_\_ because then I would be a \_\_\_\_. * I can change a \_\_\_\_ into a \_\_\_\_ by \_\_\_\_\_ * For a \_\_\_\_ to become a \_\_\_\_ you need to \_\_\_\_\_\_. | Use the ”Square Disguise” Exit Ticket to assess students’ abilities to name describe the attributes of a parallelogram. |
| **6** | * I will create a book about polygons. * I will identify and define square, pentagon, rectangle, octagon and rhombus. | * I know that this shape is not a trapezoid because \_\_\_\_. * All rectangles have these attributes \_\_\_\_\_\_. (repeat with other quadrilaterals) | Students name two kinds of quadrilaterals. Answer: What are two attributes these shapes have in common? Name one attribute that is different. |
| **7** | * I will measure and record the perimeter of polygons in centimeters, inches, and feet. | * The perimeter of a shape is \_\_\_\_\_\_\_\_\_\_. | The “What’s the Perimeter?” Exit Ticket will assess the ability of students to calculate the perimeter of shapes using square tiles. |
| **8** | * I will find perimeter by coming the length of all sides. * I will measure shapes to determine the perimeter of the shape. | * I found the perimeter of this shape by \_\_\_\_\_\_\_\_\_\_. * The perimeter of this shape is \_\_\_\_\_\_. | Use the” Finding Perimeter” Exit Ticket to assess students’ ability to calculate the area of a variety of shapes. |
| **9** | * I will find the missing length of the of a shape when I know the perimeter. * I will use what I know about shapes to find the perimeter. | * I found the perimeter of this shape by \_\_\_\_\_\_\_\_\_\_. * The perimeter of this shape is \_\_\_\_\_\_. | Use the “Perimeter Problems” Exit Ticket to assess student ability to find the length of missing side given the perimeter or to use known information to find the perimeter when some information is missing. |
| **10** | * I will solve real-world and complex geometric perimeter problems by applying geometric and measurement concepts. | * I started to solve this task by \_\_\_\_\_. | Use the Mystery Perimeter Exit Ticket to assess whether or not students can find an entry point for a complex perimeter problem and to determine whether or not students are able to find the perimeter of an irregular figure. |
| **11** | * I will solve real-world and complex geometric perimeter problems by applying geometric and measurement concepts. | * The attributes of this shape are \_\_\_. * These two shapes both \_\_\_\_. * I found the perimeter by \_\_\_\_. * I found the missing length by \_\_\_\_. | Geometry End of Unit Assessment |

# **Unit 3: Collections and Travel Stories**

*Estimated Duration: 28 days (October 13, 2016 – November 29, 2016)*

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| **Expectations for Students at the End of the Unit** | |
| **Students will know:**   * Addition is combining two or more numbers. Subtraction is removing or taking away a part. Subtraction is also used to compare or find the difference between to numbers. Visualizing an addition or subtraction situation can help make sense of a story problem * Addition and subtraction are inverse operations. We can use the inverse relationship between addition and subtraction to help us solve problems. * An equation can be used to represent a story problem. A letter in an equation represents an unknown quantity. * Rounding is changing numbers to “friendlier” numbers to make it easier to add and subtract. Estimation is using rounded numbers to make sure a sum or difference is close of the actual answer when an exact answer is not needed or to make sure an exact answer is close to what it should be. * We can use different strategies to add or subtract multi-digit numbers. * We use place value to add and subtract when we break numbers apart into hundreds, tens, and ones. * We can use properties of operations (commutative, associative) to add and subtract because sometimes changing the order of the numbers makes them easier to add or subtract. * All patterns follow a rule. We can find the next number in a sequence using the rule. * There are 60 minutes in one hour. The dots or lines around the edge of the clock count minutes. * There are 24 hours in one day. The hours are represented on an analog clock with numbers 1 to 12. * The shorter hand on a clock keeps track of the hour. This hand moves between hours as time passes. It must be all the way to an hour before we say it is that hour (At 3:45, the hour hand is closer to 4, but because it is not all of the way to 4, we still say it is 3 something). * The longer hand on the clock keeps track of the minutes (It’s longer because it has to reach to the lines/dots at the edge of the clock). We can count minutes faster by counting by 5’s at each numeral or 15’s at each quarter hour. | **Students will be able to:**   * Correctly sequence 2 and 3-digit numbers. * Use tools such as 1,000 charts, sketches of stickers, and number lines to help solve problems. * Break numbers apart by place value, and recombine them. * Find reasonable estimates of sums. * Locate 3-digit numbers on the 1,000 chart. * Add and subtract multiples of 10. * Find accurate solutions to 2 and 3-digit addition and subtraction problems. * Write equations to represent thinking. * Subtract 2 and 3-digit numbers accurately from multiples of 100. * Tell and write time to the nearest minute and measure time |
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| **Investigation 1**  **Estimated Duration: 7 days** | | | |
| **Lesson** | **Student I Will Statements** | **Supporting Accountable Talk** | **Assessment** |
| **1.1** | * I will construct 1,000 from groups of 100. * I will read, write, and sequence numbers to 1,000. | * Explain how the Sticker Station works. * The 1,000 chart is similar/different from the 100 chart in that \_\_\_\_\_\_\_. * I used landmark numbers to locate \_\_\_\_\_ by \_\_\_\_\_\_\_\_\_. | Student Activity Book (SAB) page 2 (Addition and the 700 Chart) assesses students’ understanding of reading and writing numbers on the 1,000 chart, as well as their addition of numbers up to 1,000. Use the ongoing assessment questions on page 32 to guide conversations. |
| **1.2** | * I will read, write, and sequence numbers to 1,000. * I will use place value to determine the size of any number to 1,000. | * The information located on the card is \_\_\_\_\_\_\_\_. * The strategy I used to sequence the numbers is\_\_\_\_\_\_\_\_\_. | SAB page 3 (Collections: Smallest to Largest), problem 2, will help determine students’ understanding of sequencing numbers up to 1,000. Use the ongoing assessment questions on page 37 as you analyze student work. |
| **1.3** | * I will estimate the sums of 2 and 3 digit numbers using knowledge of place value and known combinations. * I will find pairs of numbers that add to 100. * I will read, write, and sequence numbers to 1,000. | * The strategy I used to estimate the sum is \_\_\_\_\_. * I decided to use my wild card in Close to 100 because \_\_\_\_. * The addition expression I wrote to combine the quantities is \_\_\_\_\_. | The ongoing assessment questions (pages 44 and 45) will help determine students’ abilities and strategies of estimating and adding 2- and 3-digit numbers as they play *Close to 100*. |
| **1.4** | * I will recognize and represent the groups of 10s in 3-digit numbers. * I will find pairs of numbers that add to 100. * I will estimate the sums of 2 and 3 digit numbers using knowledge of place value and known combinations. | * I think we have 1,000 \_\_\_\_. * It would be reasonable to collect 1,000 \_\_\_\_\_\_ because\_\_\_. * I figured out how many groups of ten were in \_\_\_\_ by\_\_\_\_\_. * Looking at the number \_\_\_, I know it has \_\_\_\_ tens/hundreds because \_\_\_\_. | SAB page 11 (How Many 10s? Part 1) can be collected as an informal assessment as part of students’ portfolio. Reference the ongoing assessment questions on page 49 as you analyze student work samples. |
| **1.5** | * I will find the difference between 3-digit numbers. * I will recognize and represent the groups of 10s in 3 digit numbers. * I will estimate the sums of 2 and 3 digit numbers using knowledge of place value and known combinations. | * We can keep track of our collection by \_\_\_\_. * I agree/disagree with their solution because \_\_\_. | Use SAB page 17 (Class Collection Data-Week 1) and the ongoing assessment questions on page 54 to check students’ understanding of adding 2-digit numbers and finding the difference between the sums and 3-digit numbers. |
| **1.6** | * I will find the difference between 3-digit numbers. * I will recognize and represent the groups of 10s in 3-digit numbers. * I will find pairs of numbers that add to 100. | * There are \_\_\_ groups of \_\_\_ in\_\_\_\_\_\_. I know this because \_\_\_. * The relationship between the totals is \_\_\_\_. * I think my solution is true for the number \_\_\_ as well because \_\_\_. | SAB page 18 (How Many 10s? Part 3) assesses students’ understanding of adding and subtracting within 1,000. Use the ongoing assessment questions on page 54. |
| **1.7A** | * I will use place value understanding to round whole numbers to the nearest ten or hundred. * I will tell time to the nearest 5 minutes and measure time intervals in minutes. * I will represent 3-digit numbers using expanded form. | * The nearest ten/hundred is \_\_\_\_. I know this because \_\_\_. * Expanded form helps me round numbers because \_\_\_\_\_. | SAB page 22D (Rounding to Tens and Hundreds) checks student understanding of rounding to the nearest 10 and the nearest 100. |

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| **Investigation 2**  **Estimated Duration: 7 days** | | | |
| **Lesson** | **Student I Will Statements** | **Supporting Accountable Talk** | **Assessment** |
| **2.1** | * I will represent the structure of 3-digit numbers as being composed of 100s, 10s, and 1s. * I will solve addition problems with 2 and 3 digit numbers up to 400 by breaking numbers apart and recombining them. * I will represent addition strategies. | * \_\_\_'s collection would look like \_\_\_\_. The combined collection would look like \_\_\_. * There are no tens/hundreds in the combined collection because \_\_\_. * Some of the ways I broke the numbers apart are \_\_\_. This made the problem easier to solve because \_\_\_. * In \_\_\_'s strategy they broke the number apart by\_\_\_. | SAB page 24 (94 Stickers) assesses student understanding of solving addition problems with 2- and 3-digit numbers. |
| **2.2** | * I will estimate the sum of 2 and 3-digit numbers using knowledge of place value and known combinations. * I will solve addition problems with 2 and 3-digit numbers up to 400 by breaking numbers apart and recombining them. * I will represent addition strategies. | * I know the total will be more or less than \_\_\_ because \_\_\_. * I know my estimate is reasonable because \_\_. * Some of the ways I broke the numbers apart are \_\_\_. This made the problem easier to solve because \_\_\_. * After the step \_\_\_\_\_, the step I still have left to do is \_\_\_. | SAB page 28 (Addition Problems) provides data for students’ understanding of solving addition problems with 2- and 3-digit numbers. Reference the ongoing assessment questions on page 77 as you analyze students’ work. *\*Have student estimate the addends and sum before solving the problems.* |
| **2.3** | * I will add and subtract multiples of 10 and 100. * I will read, write, and sequence numbers to 1,000. * I will recognize and represent the groups of 10s in 3-digit numbers. | * I ended at a number greater/less than our starting number because \_\_\_\_. * While playing the game I used the \_\_\_\_ strategy. This was the best strategy to use because \_\_\_. | Utilize the Assessment: Numbers on the 1,000 Chart (M35) and the Assessment Checklist (M39) as informal assessments. As you assess students’ understanding, reference the ongoing assessment questions on page 83. |
| **2.4** | * I will solve addition problems with 2 and 3-digit numbers up to 400 by breaking numbers apart and recombining them. * I will develop strategies for solving addition problems by focusing on how each strategy starts. | * The steps to my solution are \_\_\_. * \_\_\_\_ started the problem by \_\_\_. * The next step would be \_\_\_. | SAB page 35 (Collections Story Problems) and the ongoing assessment questions on page 86 will provide opportunities to check students’ understanding of solving addition story problems with 3-digit numbers. |
| **2.5** | * I will develop strategies for solving addition problems by focusing on how each strategy starts. * I will solve addition problems with 2 and 3-digit numbers up to 400 by breaking numbers apart and recombining them. | * \_\_\_\_ was the easiest problem to solve because \_\_\_. * The strategy I chose to solve the final problem was \_\_\_. I chose this one because \_\_\_\_. | SAB page 42 (More Starter Problems) informally assesses students’ understanding of solving addition problems in a variety of ways using the ongoing assessment questions on page 93. |
| **2.6** | * I will add and subtract multiples of 10 and 100. * I will develop strategies for solving addition problems by focusing on how each strategy starts. | * If my piece is laying on \_\_\_ and I wanted to capture a marker on \_\_\_\_ I could use the change cards \_\_\_\_ to capture a marker. * If my Plus/Minus card was \_\_\_ instead of \_\_\_ I would land on \_\_\_. The digit would change by \_\_\_. | The ongoing assessment questions (page 96) will serve as an informal assessment of students’ knowledge of strategies and concepts related to solving 2- and 3-digit addition problems as they play *Combining Collections*.  Utilize the Addition Strategies assessment (M42) as an informal assessment of strategies students use to solve addition problems. Reference pages 195-201 in your TM as you analyze students’ work. |
| **2.7** | * I will solve addition problems with 2 and 3-digit numbers up to 400 by breaking numbers apart and recombining them. * I will add and subtract multiples of 10 and 100. * I will develop strategies for solving addition problems. | * The strategy I selected was \_\_\_. This strategy is the easiest for me because \_\_. * The steps I used to solve my problem are \_\_\_. * I decided to use this strategy because \_\_\_. | Utilize the Addition Strategies assessment (M42) as an informal assessment of strategies students use to solve addition problems. Reference pages 195-201 in your Teacher Manual as you analyze students’ work. |

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| **Investigation 3**  **Estimated Duration: 6 days** | | | |
| **Lesson** | **Student I Will Statements** | **Supporting Accountable Talk** | **Assessment** |
| **3.1-3.2** | * I will find the difference between 2 and 3-digit numbers and 100. * I will use multiples of 100 as a landmark to solve subtraction problems. | * I found the difference between \_\_\_ and \_\_ by \_\_\_. * A combination I know to make 100 is \_\_\_ + \_\_\_. I can use the distance from 100 to solve the problem \_\_\_ - \_\_\_. * The equation that will solve this problem is \_\_\_\_\_. This equation will give me the solution because \_\_. | SAB page 50 (Distance Riddles), problems 4 and 5, to check students’ understanding of finding pairs of 2- and 3-digit numbers at given distances from 100 and determine the distance between each pair of numbers. Use the ongoing assessment questions on page 118 as you analyze students’ work. |
| **3.3** | * I will find the difference between 2 and 3-digit numbers and 100. * I will use the value of each place to make 2 and 3-digit numbers closest to 100. * I will use multiples of 100 as a landmark to solve subtraction problems. | * I chose to put the digit in the \_\_\_ place because \_\_\_. * I figured out the answer by \_\_\_\_. | The ongoing assessment questions (page 124) will serve as an informal assessment as students play How Far From 100? to determine the distance between number and the difference between each number and 100. |
| **3.4** | * I will solve subtraction problems that involve finding a missing part. * I will visualize and represent the action of subtraction problems, which involve finding a missing part. * I will find the difference between two numbers by either adding or subtracting. | * The strategy I used to solve the travel problem was \_\_\_. My solution is reasonable because \_\_\_. * The tools I used to represent my strategy are\_\_\_\_\_. * An equation that represents my thinking is \_\_\_\_\_\_. This equation represents the problem because \_\_\_. | As students work on solving travel problems, reference the ongoing assessment questions on pages 131 to informally assess students’ understanding of solving subtraction problems that involve finding a missing part. |
| **3.5** | * I will find the difference between two numbers by either adding or subtracting. * I will solve subtraction problems that involve finding a missing part. * I will use multiples of 100 as a landmark to solve subtraction problems. | * I used addition to figure out the distance by \_\_\_\_. * An addition/subtraction equation that shows my thinking is \_\_\_. | SAB page 58 (More Travel Problems), problem 3, assesses students’ understanding of subtraction problems that involve finding a missing part. Reference the ongoing assessment questions on page 139. |
| **3.6** | * I will solve subtraction problems that involve finding a missing part. * I will visualize and represent the action of a subtraction problem, which involves finding a missing part. * I will find the difference between two numbers by either adding or subtracting. | * The strategy I used to solve the first part of each problem is \_\_\_. * The landmark number or stopping off number I used was \_\_\_. I selected this number because \_\_\_. * The equation \_\_\_ accurately represents my strategy because \_\_\_. * I used a number line to solve this problem. It can be explained by \_\_\_. | Utilize the Assessment: How Far Did They Travel? (M61-M62) as an informal assessment. Reference pages 205-209 in the TM as you analyze students’ work to determine strategies and level of knowledge. |
| **3.7** | * I will solve subtraction problems that involve finding a missing part. * I will visualize and represent the action of a subtraction problem which involves finding a missing part. | * The equation \_\_\_ shows my way of thinking about the problem. This is what my thinking looks like on a number line \_\_\_\_\_. * The missing information in the travel problem is\_\_\_. This information represents \_\_\_. | Continue to utilize the Assessment: How Far Did They Travel? (M61-M62) as an informal assessment. Reference pages 205-209 in the TM as you analyze students’ work to determine strategies and level of knowledge. |

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| **Investigation 4**  **Estimated Duration: 6 days** | | | |
| **Lesson** | **Student I Will Statements** | **Supporting Accountable Talk** | **Assessment** |
| **4.1** | * I will visualize and represent the action of comparison problems. * I will understand comparison as the difference between two numbers. * I will solve subtraction story problems that involve comparison. | * In my mind I picture \_\_\_. * In order to solve this problem I need to figure out \_\_\_. The missing information in this picture is \_\_\_ * My solution is accurate because \_\_\_. | SAB page 64 (Comparing Lengths and Heights), problem 3, provides data regarding students’ abilities and strategies for finding the difference between two numbers. Use the ongoing assessment questions on page 161 as you analyze student work. |
| **4.2** | * I will use number lines to represent solutions to comparison problems. * I will find the difference between two numbers by either adding or subtracting. * I will solve subtraction story problems that involve comparison. | * An equation that represents my thinking is \_\_\_. * “How many more” and “How many need to be added or subtracted to make the quantities” is the same because both \_\_\_. * The strategy I used to determine the difference is \_\_\_. | SAB page 68 (Oldest Animals), problem 3, assesses understanding of comparing two quantities. Use SAB page 68 with the ongoing assessment questions on page 167. |
| **4.3** | * I will reason about how increasing or decreasing the numbers in a subtraction problem affects the difference. * I will solve subtraction story problems that involve comparison. * I will find the difference between 2 and 3-digit numbers and 100. | * If you had \_\_\_ and you spent \_\_ you would have\_\_\_\_. If you started with a different amount that would impact how many you had left by \_\_\_\_. * The strategy I used to determine the difference is \_\_\_. * My solution is accurate because \_\_\_. | As students complete work through 4.3, refer to the ongoing assessment questions on page 180 as an informal assessment of students’ understanding of subtracting 2- and 3-digit numbers. |
| **4.4** | * I will use multiples of 100 as a landmark to solve subtraction problems. * I will solve subtraction story problems that involve removal. * I will solve subtraction problems with 2 and 3-digit numbers up to 300 using strategies that involve either subtracting one number in parts, adding up, or subtracting back. | * If you had \_\_\_ and you spent \_\_ you would have\_\_\_\_. If you started with a different amount that would impact how many you had left by \_\_\_\_. | SAB page 77 (Parking Garage), problem 3, assesses students’ understanding of subtracting 2- and 3-digit numbers. As you analyze student work, refer to the ongoing assessment questions on page 180. |
| **4.5** | * I will visualize and represent the action of removal problems. * I will solve subtraction problems with 2 and 3-digit numbers using strategies that involve either subtracting one number in parts, adding up or subtracting back. * I will visualize and represent the action of a subtraction problem, which involves finding a missing part. * I will visualize and represent the action of comparison problems. | * My story problem represents a subtraction problem because \_\_\_. * The strategy to solve this problem could look like \_\_. * I noticed that \_\_\_ solved the problem by \_\_ and \_\_\_ solved the problem by \_\_\_. Their strategies are different/similar because\_\_\_\_. | Use SAB page 79 (Solving Subtraction Problems), problem 4, and the ongoing assessment questions on page 184 to check students’ understanding of subtracting 2- and 3-digit numbers and creating a problem to match an equation. |
| **4.6** | * I will visualize and represent the action of removal problems. * I will solve subtraction problems with 2 and 3-digit numbers using strategies that involve either subtracting one number in parts, adding up or subtracting back. * I will visualize and represent the action of a subtraction problem which involves finding a missing part. * I will visualize and represent the action of comparison problems. | * An addition/subtraction strategy I can use with efficiency is \_\_\_\_\_. I know my solutions are correct because \_\_\_. | Resource Masters M64-M65 (End-of-Unit Assessment) can be used as a formal assessment of students’ understanding of addition and subtraction. When grading the assessment, reference pages 212-218 in the Teacher’s Manual for a suggested rubric  .  The NC Mathematics Test Prep Investigation book has a multiple choice assessment for Unit 3 (pages 13-19) that your team may choose to use in addition to the open-ended questions mentioned above. |

# **Unit 5: *Equal Groups***

*Estimated Duration: 19 days (November 30, 2016 – January 23, 2016)*

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| **Expectations for Students at the End of the Unit** | |
| **Students will know:**   * Multiplication is counting in same-size (equal) groups or rows. * A multiplication equation like 3 x 5 should be read as 3 “groups of” 5. Multiplication is thinking about groups rather than individual numbers. Multiplication can be solved with skip counting or repeated addition. * Division is partitioning a number of objects into an equal number of groups OR subtracting out the same-size group over and over. When you divide you start with the whole group and then break the total into equal groups or equal “teams.” * Multiplication and division situations can be represented with an array. Arrays have an equal number of rows and an equal number of columns. * Equations can be used to represent a multiplication situation. We use a symbol or letter to represent the part we do not know. * Drawings can be used to represent multiplication situations. * The product is the same if we switch the order of two numbers in a multiplication situation. * When multiplying 3 numbers, the product will not change if you change which two numbers you multiply first. * When multiplying two numbers, we can break one number into two or more parts and multiply the other number time each of the parts. Then we add the parts to get the product * Any number multiplied by 1 equals itself. Any number multiplied by 0 equals 0. * Division is the inverse operation of multiplication. Division is a multiplication problem with a factor missing. * A factor is one of the numbers in a multiplication expression. * A product is the answer to a multiplication combination. * Some story problems require more than one operation to solve. Visualizing and acting out a problem situation can help make sense of a story problem. * An equation can be used to represent a story problem. We can use a blank or symbol to represent the part we don’t know. * We can break apart a number using place value to multiply the number. Multiples of 10 can be broken into 10 x another factor. We use the associative property to find the product. 6 x 30 = 6 x 3 x 10 = 18 x 10. 18 x 10 is 10 tens & 8 more tens or 180. So 6 x 30 = 180. | **Students will be able to:**   * Demonstrate an understanding of the concept of equal groups. * Correctly use multiplication and division notation. * Count by 2s, 3s, 4s, 5s, 6s, and 10s. * Identify and describe patterns on the 100s chart. * Solve story problems that involve multiplication and division. * Write story problems that involve multiplication and division. * Use smaller, known multiplication combinations to solve problems. * Use tiles to find the area of a rectangle. * Find products represented by array cards. * Multiply by multiples of 10. * Use properties of operations to find a product. * Use place value to find the product of a single digit number times a multiple of 10. |
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| **Investigation 1**  **Estimated Duration: 4 days** | | | |
| **Session** | **Student I Will Statements** | **Supporting Accountable Talk** | **Assessment** |
| **1.1** | * I will combine equal groups to multiply. * I will visualize & list items that come in groups | * \_\_\_\_\_ comes in groups of \_\_\_\_\_\_\_. * Some number of groups were harder to find because \_\_\_\_\_\_. | Student Activity Book (SAB) page 1 (Wheels, Apples, and Days), problem 3 assesses students’ understanding of solving multiplication problems. Use the ongoing assessment questions on page 26 to analyze the strategies students use. |
| **1.2** | * I will represent items that come in groups * I will describe the group, the number in each group and the total number of items in my representation * I will use multiplication notation to represent my picture | * Here are \_\_\_\_\_. Each \_\_\_ has \_\_\_\_. There are \_\_\_\_\_ in all. * The number of groups is \_\_\_\_\_. The number in each group is \_\_\_\_\_. The product is \_\_\_\_\_. * I can represent the problem by using this repeated addition equation \_\_\_\_\_\_\_. * I can represent the same problem by using this multiplication equation \_\_\_\_\_\_. | Resource Master (M) 6 (Pictures of Things That Come in Groups) assesses students’ understanding of writing multiplication equations that represent the multiplication situations in their pictures of things that come in groups. Use the ongoing assessment questions on page 33 as you analyze student work. |
| **1.3** | * I will create multiplication riddles using the “things that come in groups” list. * I will solve riddles created by my partners. * I will interpret multiplication story problems using various strategies for counting. | * When counting around the room by \_\_\_\_, I predict we will end on number \_\_\_\_\_. * When making my prediction I was thinking about \_\_\_\_. * In the picture there are \_\_\_\_\_. Each \_\_\_ has \_\_\_\_. There are \_\_\_\_ there. | SAB page 6 (Picture Problems)assesses students’ understanding of solving problems about multiplication illustrations. Use the ongoing assessment questions on page 37 to analyze the strategies students use. |
| **1.4** | * I will compare representations and strategies with a partner and describe how our representations are similar and different. | * I solved this problem by \_\_\_\_\_\_\_. * The number of groups is \_\_\_\_\_. The number in each group is \_\_\_\_\_. The product is \_\_\_\_\_. | Use the assessment activity on page 41 (Solving Problems About Our Pictures) to assess students’ understanding of multiplication as involving groups of equal groups and their interpretation and use of multiplication notations. Use the ongoing assessment questions on page 41 to analyze the strategies students use. |

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| **Investigation 3**  **Estimated Duration: 9 days** | | | |
| **Session** | **Student I Will Statements** | **Supporting Accountable Talk** | **Assessment** |
| **3.1A** | * I will use tiles to find the area of a rectangle. * I will develop an understanding that area can be found by multiplying the dimensions of a rectangle. | * The area of a shape is \_\_\_\_. * I can describe the rectangle by using the dimensions \_\_\_\_\_. * I used multiplication combinations to determine the area by \_\_\_\_\_\_. | SAB page 26F (What’s the Area?)assesses students’ understanding of using the dimensions of a rectangle, as well as unit squares, to find the area.. Use the ongoing assessment questions on page CC34 to analyze the strategies students use. |
| **3.1** | * I will use arrays to model multiplication situations. * I will use arrays to find factors of 2-digit numbers up to 50. | * In my arrangement there are \_\_\_\_ rows with \_\_\_ chairs in each row. * The pairs that multiply to \_\_\_\_ are \_\_\_\_\_. | As students work on the Arranging Chairs activity, assess their ability to find factors of a given number to 30 using the ongoing assessment questions on page 85. |
| **3.2** | * I will use arrays to identify characteristics of numbers, including prime and square numbers. * I will use arrays to find factors of 2-digit numbers up to 50. | * I know that \_\_\_\_ is a square number because \_\_\_\_. * The factors of \_\_\_ are \_\_. * I know that \_\_\_ is a prime number because \_\_\_\_. | As students make array cards, assess their ability to label the dimensions and products using the ongoing assessment questions on page 90. |
| **3.3** | * I will use arrays to find a product by skip counting by one of its dimensions. * I will break an array into parts to find the product represented by the array. * I will identify and learn multiplication combinations not yet known. | * I figured out the number of squares in the \_\_\_\_ array by \_\_\_\_\_\_. | As students complete the math workshop activities, use the ongoing assessment questions on pages 85 and 90 to assess their understanding of multiplication, breaking an array into parts, and finding products. |
| **3.4** | * I will use arrays to find a product by skip counting by one of its dimensions. * I will identify and learn multiplication combinations not yet known. * I will use known multiplication combinations to determine the product of more difficult combinations. | * I can use the product of \_\_\_\_\_ to figure out \_\_\_\_. | As students play *Factor Pairs*, the ongoing assessment questions (page 99) will help assess students’ ability to determine the products represented by arrays when given the dimension of arrays. |
| **3.5A** | * I will identify and learn multiplication combinations not yet known. * I will use known multiplication combinations to determine the product of more difficult combinations. * I will use arrays, and rectangles made from square tiles, to illustrate the distributive property. | * \_\_\_\_ is a hard combination to solve. I used the smaller combinations of \_\_\_\_\_\_ and \_\_\_\_\_ to help me solve the harder combination. | * As students continue to play *Factor Pairs*, the ongoing assessment questions (page 99) will help assess students’ ability to determine the products represented by arrays when given the dimension of arrays. |
| **3.5B** | * I will identify and learn multiplication combinations not yet known. * I will use known multiplication combinations to determine the product of more difficult combinations. * I will use arrays, and rectangles made from square tiles, to illustrate the distributive property. | * \_\_\_\_ is a hard combination to solve. I used the smaller combinations of \_\_\_\_\_\_ and \_\_\_\_\_ to help me solve the harder combination. | * As students make multiplication cards, assess their abilities to use multiplication combinations they know to help them solve and learn combinations with which they are not yet fluent. Utilize the ongoing assessment questions on page CC45 to analyze students’ work. |
| **3.6** | * I will break an array into parts to find the product represented by the array. * I will identify and learn multiplication combinations not yet known. * I will use known multiplication combinations to determine the product of more difficult combinations. | * \_\_\_\_ is a hard combination to solve. I used the smaller combinations of \_\_\_\_\_\_ and \_\_\_\_\_ to help me solve the harder combination. | * As students play *Count and Compare*, the ongoing assessment questions (page 109) will help assess students’ ability to think about relationships between size, shape, and dimensions by comparing two arrays. |

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| **Investigation 4**  **Estimated Duration: 7 days** | | | |
| **Session** | **Student I Will Statements** | **Supporting Accountable Talk** | **Assessment** |
| **4.1** | * I will interpret missing factor story problems. * I will solve missing factor story problems. * I will compare my strategies for solving equal groups problems * I will represent solutions using cubes, drawings and equations. | * The problem \_\_\_\_ is the same/different from the problem \_\_\_\_ in that \_\_\_\_\_. * The information given in the problem is \_\_\_\_. I need to find out \_\_\_\_. I solved the problem by \_\_\_\_. | SAB page 40 (Division Stories) assesses students’ abilities to solve division story problems and represent their solutions. Use the ongoing assessment questions on page 118 to analyze the strategies students use. |
| **4.2** | * I will interpret multiplication and division situations * I will solve problems using various strategies * I will decide if a problem describes multiplication or division and justify | * After reading this story problem I know \_\_\_\_. I need to try to find out \_\_\_\_\_. * The problem \_\_\_\_ is the same/different from the problem \_\_\_\_ in that \_\_\_\_\_. | SAB page 43 (Story Problems), questions 5 and 6 assesses students’ abilities to determine which operation to use (multiplication and division) and to represent their solutions. |
| **4.3** | * I will compare and contrast multiplication and division story contexts. * I will write and solve multiplication and division problems in context. * I will use and interpret mult/div notation | * I know my story problem represents division/multiplication because \_\_\_\_. * When evaluating my solution I noticed that \_\_\_\_\_. | As students complete the math workshop activities, use the ongoing assessment questions on page 127 to assess their ability to write multiplication and division story problems. |
| **4.4** | * I will use multiplication combinations to solve division problems. * I will use and understand multiplication and division notation. * I will use the inverse relationship between multiplication and division to solve problems. | * The information I know is \_\_\_. The information that is missing is \_\_\_. | As students play *Missing Factors*, the ongoing assessment questions (page 131) will help assess students’ ability to determine the missing factor of an array when the product and one factor are given. |
| **4.5** | * I will use multiplication combinations to solve division problems. * Use the inverse relationship between multiplication and division to solve problems. | * I can rewrite my story problem by \_\_\_\_\_. * I know multiplication and division are related because \_\_\_\_\_. * I know my solution is accurate because \_\_\_\_. | As students continue to play *Missing Factors*, the ongoing assessment questions (page 131) will help assess students’ ability to determine the missing factor of an array when the product and one factor are given. |
| **4.6** | * I will use multiplication combinations to solve division problems. * I will use the inverse relationship between multiplication and division to solve problems. | * I started solving my problem by \_\_\_\_\_. * The part of the problem I have left to solve is \_\_\_\_. | As students play a variety of games from Unit 5, 4, reference the ongoing assessment questions related to the games they play to assess students’ understanding of multiplication and division. |
| **4.7** | * I will understand multiplication as combining equal groups. * I will understand division as the splitting of a quantity into equal groups. * I will understand the relationship among skip counting, repeated addition, and multiplication. | * The steps that I used to solve my problem are \_\_\_\_\_. * I know my solution is accurate because \_\_\_\_. | Resource Master M44 (End-of-Unit Assessment) can be used as a formal assessment of students’ understanding of multiplication and division. When grading the assessment, reference pages 165-169 in the Teacher’s Manual for a suggested rubric.  The NC Mathematics Test Prep Investigation book has a multiple choice assessment for Unit 5 (pages 25-29) that your team may choose to use in addition to the open-ended questions mentioned above. |

# **CMS Linking Multiplication to Area and Graphing Unit**

*Estimated Duration: 21 days (January 25, 2016 – February 1, 2017)*

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| **Expectations for Students at the End of the Unit** | |
| **Students will know:**   * A square with a side of 1 unit is a unit square and said to have an area of 1 square unit. (A square inch is one inch on each side. A square meter is one meter on each side. A square foot is one square on each side.) * Area is an attribute of a shape. We measure area by counting the number of square units needed to cover a figure without gaps or overlaps. * We can find the area of a rectangle by multiplying the length and width because it forms an array. * A rectangular area can be split into two parts to find the area of each part. The areas should be combined to find the total area. * Data can be collected to compare attributes of the people or things being surveyed. * Pictographs and bar graphs are used to make comparison data easy to see. * Pictographs need a title, one labeled axis to know the attributes surveyed, and a key to show the value of the symbol. * Pictographs use pictures or symbols to display data comparing attributes. Each picture or symbol represents a number. Use the key to know how many each symbol represents. * Some symbols on a pictograph only show half, because it only represents half of the number represented by the symbol. * We can use data in pictographs to answer questions we have about the data. * Bar graphs need a title, two labeled axises, one axis with a number scale that may count by 1’s or another number, and one axis with the attributes being compared. * Bar graphs use bars to display data. The bar begins at 0 and ends at the number of people or things that had the attribute being compared. * We can compare bars or groups of bars to answer questions using the data collected. | **Students will be able to:**   * Use square tiles to measure the number of square unit of a shape. * Measure rectangles using square units of different sizes. * Use multiplication to find the area of rectangular arrays. * Create a scaled picture graph. * Create a scaled bar graph. * Answer one and two-step questions about data in picture graphs and bar graphs. |
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| **CMS Linking Multiplication to Area and Graphing Unit**  **Estimated Duration: 6 days** | | | |
| **Lesson** | **Student I Will Statements** | **Supporting Accountable Talk** | **Assessment** |
| **1** | * I will use square tiles to measure the square units of shapes. | * I estimated the area to be \_\_\_\_\_ because \_\_\_. * The shape with the greatest area is \_\_\_ and the shape with the smallest area is \_\_\_. | Use the” What is the Area?” Exit Ticket to assess students’ ability to use unit squares to determine area. |
| **2**  **Unit 5**  **Session 3.1A** | * I will use tiles to find the area of a rectangle. * I will develop an understanding that area can be found by multiplying the dimensions of a rectangle. | * The area of a shape is \_\_\_\_. * I can describe the rectangle by using the dimensions \_\_\_\_\_. * I used multiplication combinations to determine the area by \_\_\_\_\_\_. | SAB page 26F (What’s the Area?) assesses students’ understanding of using the dimensions of a rectangle, as well as unit squares, to find the area.. Use the ongoing assessment questions on page CC34 to analyze the strategies students use. |
| **3** | * I will measure rectangles using square units of different sizes. | * I used \_\_\_\_ to measure \_\_\_\_ but \_\_\_\_\_ to measure \_\_\_\_\_\_ because \_\_\_\_. * I decided what unit to use based on \_\_\_\_It is important to know the length of the side of the square unit you are using to measure because \_\_\_\_\_. | Use the question “Would you measure the size of your school hallway in square inches or square yards? Explain why.” to assess students’ understanding of different units of measurement. |
| **4** | * I will create a picture graph using symbols that represent more than one student. | * I combined \_\_ and \_\_\_, which is more or less than the number of students \_\_\_\_. | Use the pictograph exit ticket to assess students’ understanding of analyzing and interpreting data in a pictograph. |
| **5** | * I will create a scaled bar graph that includes a title and labels | * I created more \_\_\_\_ than \_\_\_\_ because \_\_\_\_. | Use the bar graph exit ticket to assess students’ understanding of analyzing and interpreting data in a bar graph. |

# **Unit 7: *Finding Fair Shares***

*Estimated Duration: 20 days (February 2, 2017 – March 3, 2017)*

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| **Expectations for Students at the End of the Unit** | |
| **Students will know:**   * When we partition a shape into equal parts or areas, we use numbers called fractions to describe the parts. * If there are…   2 equal parts, then one part is called one half or ½  3 equal parts, then one part is called one third or 1/3  4 equal parts, then one part is called one fourth or ¼  6 equal parts, then one part is called one sixth or 1/6  8 equal parts, then one part is called one eighth or 1/8   * When a whole is divided into equal parts, we record one part with a fraction that has a numerator 1 (for one piece) and the denominator that is the number of equal parts to make a whole. A fraction with a numerator 1 is called a unit fraction. You must know what 1 whole is before naming a fraction. * Fractions with a numerator that is greater than 1 are made by putting unit fractions together. * The denominator is the number of equal parts to make a whole. The numerator is the count of the number of equal parts. (3/4 means that there are 3 one fourths) * If the number of equal pieces in a whole increases, the size of the equal pieces decrease (1/2 > ¼) * The size of the fractional part depends on the size of the whole. (half of an Oreo is smaller than half of a large pizza) * Number lines can be partitioned into equal parts between 0 and 1. The equal parts can be labeled using fractions. * Two fractions are equivalent if they are the same size or the same place on the number line. * Whole numbers have fraction equivalents. (ie 3/1 = 3 and 6/1=6; 4/4=1) * If 2 fractions have the same numerator, the fraction with the smaller denominator is bigger. * If 2 fractions have the same denominator, the fraction with the greater numerator is larger because it has more same-size pieces. * We measure the length of objects using inches. Some objects fall between two inches. * We can mark ½ in the middle of an inch and quarter in the middle of ½. ½ is the middle between 0 and 1; 1 ½ is the middle between 1 and 2; 2 ½ is the middle between 2 and 3; etc. * We can use measurement data to create a line plot. A line plot is a number line marked with an X over each number for each time an item measures the length represented by that number. | **Students will be able to:**   * Partition an area into equal parts(using halves, fourths, eighths, thirds, and sixths). * Correctly label both unit fractions and fractions with numerators greater than one. * Prove that shares are equal by cutting, measuring, folding, or reasoning. * Divide a group of things into equal shares and identify the fraction for each share. * Use a combination of different-sized fractions to make a whole. * Recognize equivalent fractional amounts. * Identify and label fractions on a number line. |
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| **Investigation 1**  **Estimated Duration: 3 days** | | | |
| **Session** | **Student I Will Statements** | **Supporting Accountable Talk** | **Assessment** |
| **1.1** | * I will find equal parts of a whole and name them with fractions. * I will divide an area into equal parts. * I will name fraction parts with unit fractions. | * The fraction that each person will receive is \_\_\_\_\_. * I can prove that my shares are equal by \_\_\_\_. * The denominator stands for \_\_\_\_. The numerator stands for \_\_\_\_. | Student Activity Book (SAB) page 2 (Sharing One Brownie) assesses students’ ability to divide rectangles into halves, fourths, eighths, thirds, and sixths. Use the ongoing assessment questions on page 26 to analyze students’ work. |
| **1.2** | * I will divide an area into equal parts. * I will order unit fractions. * I will demonstrate that different-shaped pieces that are the same fraction of the same area have equal areas. | * I know that my pieces are the same size because \_\_\_\_\_\_. * The reason I labeled my pieces \_\_\_ is because \_\_\_\_. * I know that \_\_\_ is smaller/larger because \_\_\_\_\_. * When comparing the two pieces I realized that \_\_\_\_\_. | As students complete the activities during math workshop, use the ongoing assessment questions on pages 31 and 33 to assess students’ ability to divide paper into equal parts and to order the fractions from smallest to largest. |
| **1.3** | * I will name fractional parts with fractions that have numerators greater than 1. * I will use representations to combine fractions that sum to 1. | * I can combine the fractions \_\_\_\_ to make a whole. * I know that a \_\_\_ makes a \_\_\_ , so I can put it with a \_\_\_\_ to make a \_\_\_\_. | As students complete the activities during math workshop, use the ongoing assessment questions on pages 38 and 40 to assess students’ ability to represent fractions parts with numerators greater than one and to combine fractional parts to make a whole. |

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| **Investigation 2**  **Estimated Duration: 4 days** | | | |
| **Session** | **Student I Will Statements** | **Supporting Accountable Talk** | **Assessment** |
| **2.1** | * I will use fraction notation to record equivalencies. * I will use representations to combine fractions to equal other fractions. | * I discovered that \_\_\_ pattern blocks make a \_\_\_\_. * The combinations I found are \_\_\_\_\_\_. The combinations are the same/different in that \_\_\_. | As students work, use the ongoing assessment questions on pages 63 and 65 to assess students’ ability to combine fractions to make one whole and to write equations that equal one whole. |
| **2.2** | * I will use representations to combine fractions to equal other fractions. * I will identify equivalent fractional parts. | * An equation that describes my picture is \_\_\_\_\_. * I know I have the fewest amount of pieces I can have because\_\_\_\_. * I know my fractions are equivalent because \_\_\_\_. * I already have \_\_\_\_. If I add \_\_\_ to it I would have \_\_\_\_. | As students play *The Fraction Cookie Game*, the ongoing assessment questions (page 71) will help assess students’ ability to construct a whole with combinations and recognize equivalent fractional parts. |
| **2.3** | * I will use representations to combine fractions to equal other fractions. * I will identify equivalent fractional parts. | * I know this equation is true because \_\_\_\_\_. * I can prove it by \_\_\_\_\_\_. * I know my fractions are equivalent \_\_\_\_\_. | SAB page 23 (Many Ways to Make a Share) and the Assessment Checklist: Many Ways to Make a Share (M17) are assessments that show students’ knowledge of common equivalent fractions and combinations of fractions that are equal to one and to other fractions to construct a whole and to find a variety of ways to represent given fractions. Use the ongoing assessment questions on page 78 as you analyze students’ work. |
| **2.4** | * I will use representations to combine fractions to equal other fractions. | * I know that my design is \_\_\_\_\_\_\_. * I decided to use \_\_\_\_\_\_ because \_\_\_\_\_. | As students complete the activities during math workshop, use the ongoing assessment questions on page 84 to assess students’ ability to construct pattern block designs in which exactly half of the area is yellow.  Continue the assessment from 2.4 if necessary. |

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| **CMS Number Line Lessons**  **Estimated Duration: 9 days** | | | |
| **Session** | **Student I Will Statements** | **Supporting Accountable Talk** | **Assessment** |
| **1** | * I will accurately partition pictorial representations and number lines into fractional parts. | * I know that I shaded the correct amount because \_\_\_. * My partitioning can be explained by \_\_\_\_\_\_. | As students work, observe and listen to students as they reason throughout the tasks. Use the questions listed in the “During Box” to assess students’ understanding of partitioning shapes into equal pieces. |
| **2** | * I will use Cuisenaire rods or paper representations of rods to explore linear representations of fractions. * I will label fractions on the number line. * I will represent fractions on number line that extends from 0-2. | * The questions are asking me to \_\_\_\_\_. * I used the rods to help me with the task by \_\_\_\_. * I can explain how I used the rods by \_\_\_\_. | As students work, observe and listen to students as they reason throughout the tasks. Use the questions listed in the “During Box” to assess students’ understanding of partitioning number lines into fractional pieces. |
| **3** | * I will represent fractions on number line that extends from 0-2. | * I noticed that \_\_\_\_\_. * I drew a representation of the fraction that looks like \_\_\_\_. | Use the exit ticket referenced in the “After” box to assess students’ ability to draw a representation and to write an equation to show fraction equivalencies. |
| **4** | * I will partition a number line accurately. | * I think this example \_\_\_\_. * \_\_\_\_ is wrong with the example. | As students work, observe and listen to students as they reason throughout the tasks. Use the questions listed in the “Before Box” to assess students’ understanding of fractions on a number line. |
| **5 and 6** | * I will identify points on a number line. * I will compare fractions. | * I used the number line by \_\_\_\_\_. * First I need to \_\_\_\_\_. | The Ant Races Handout is an informal assessment of students’ understanding of equivalent fractions and fractions on a number line. This assessment would be a useful discussion tool in your PLC. |
| **7** | * I will make and use a ruler. | * I noticed \_\_\_\_. * The shortest/longest mark between the whole number is \_\_\_\_. * The \_\_\_\_ ruler is easiest to use because \_\_\_\_\_. * The \_\_\_\_ ruler is the most accurate because \_\_\_. | After students create their rules, use the questions in the “After” box to assess students’ understanding of how to read fractional parts of an inch on a ruler. |
| **8** | * I will generate measurement data and represent the data on a line plot. | * I should measure the object to the nearest \_\_\_\_ because \_\_\_\_. | As students complete the Measuring Bugs activity, use the questions in the “After” box to assess students’ ability to accurately measure fractional parts of an inch using a ruler. |
| **9**  **CMS Line Plot Day 1 Lesson** | * I will measure the lengths of objects to the nearest quarter inch. * I will use measurement data to create a line plot. | * I know this line is the longest because \_\_\_\_\_. * I know this line is the shortest because \_\_\_\_\_. * From this line plot, I learned \_\_\_\_\_. * This measurement has the least amount of lines. | Use the Line Plots Day 1 additional sheets (line lengths and question sheet) to show student proficiency when measuring lines to the nearest quarter inch and plotting on a line plot. |
| **10**  **CMS Line Plot Day 2 Lesson** | * I will measure the lengths of objects to the nearest quarter inch. * I will use measurement data to create a line plot. | * This ribbon is \_\_\_ inches long. * This is the shortest/longest ribbon because \_\_\_\_\_. * This measurement had \_\_\_ number of ribbons. | As students complete measurement activities in Line Plot Day 2, consider these questions:  -Are students able to measure lines and ribbons correctly?  -Are students able to measure lines and ribbons correctly?  -Are students able to create line plots using data collected? |

# **CMS Area & Perimeter**

*Estimated Duration: 5 days (March 6, 2017 – March 10, 2017)*

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| **Expectations for Students at the End of the Unit** | |
| **Students will know:**   * A square with a side of 1 unit is a unit square and said to have an area of 1 square unit. (A square inch is one inch on each side. A square meter is one meter on each side. A square foot is one square on each side.) * Area is an attribute of a shape. We measure area by counting the number of square units needed to cover a figure without gaps or overlaps. * We can find the area of a rectangle by multiplying the length and width because it forms an array. * A rectangular area can be split into two parts to find the area of each part. The areas should be combined to find the total area. * The area of two rectangles can be combined to find the total area. * Perimeter is the length around the outside of a polygon. * Two rectangles can have the same perimeter and different areas. Two rectangles can have the same areas and different perimeters. | **Students will be able to:**   * Show rectangles with the same perimeter and different areas. * Show rectangle with the same area and different perimeters. * Measure area by counting unit squares. * Decompose rectilinear shapes in order to find the area. * Relate area to the operations of addition and multiplication. |
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| **CMS Area & Perimeter Unit**  **Estimated Duration: 5 days** | | | |
| **Session** | **Student I Will Statements** | **Supporting Accountable Talk** | **Assessment** |
| **1**  **Unit 4, Session 2.5A** | * I will use tiles to find the area of a rectangle. * I will understand that rectangles can have the same perimeter and different areas or the same area and different perimeters. | * I can use square ties to find the area of a rectangle by \_\_\_\_. * Two rectangles can have the same perimeter/area but different areas\perimeters because \_\_\_\_. * The relationship between area and perimeter is \_\_\_\_. | SAB page 33C (Find the Area)assesses students’ ability to use color tiles to find the area of rectangles. Use the ongoing assessment questions on page CC23 to analyze student work. |
| **2** | * I will understand that rectangles can have the same perimeter and different areas or the same area and different perimeters. | * The relationship between area and perimeter is \_\_\_\_. * The pattern I noticed is \_\_\_. | Use the Area & Perimeter Exit Ticket to assess students’ ability to draw rectangles with the same perimeter and different areas or with the same area and different perimeters. |
| **3**  **Finding Area of**  **Rectilinear**  **Figures** | * I will find the area of rectilinear figures. | * I found the area of the first figure by \_\_\_\_\_. * I decomposed the shape into \_\_\_\_\_. * An equation that represents the area I found is \_\_\_. | Use the Area of Rectilinear Figures Exit Ticket to assess students’ understanding of standard units by reasoning about unit choice to measure specific items. |
| **4-5**  **Robot Performance Task** | * I will design a robot based on designated area/perimeter specifications. | * I can justify that my robot meets the required measurements because \_\_\_\_\_\_\_. * An equation that represents the area/perimeter of my robot \_\_\_\_\_\_is \_\_\_. | Use the Robot Designer Area and Perimeter Performance Task to assess students’ understanding of area and perimeter concepts. As you analyze student work, reference the rubric on page 6 within the performance task document to develop an understanding of each student’s achievement level for each standard of mathematical practice. |

# **Unit 8: *How Many Hundreds? How Many Miles?***

*Estimated Duration: 18 days (March 13, 2017 – April 6, 2017)*

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| **Expectations for Students at the End of the Unit** | |
| **Students will know:**   * Addition is combining two or more numbers. * Subtraction is removing or taking away a part. Subtraction is also used to compare or find the difference between to numbers. * Addition and subtraction are inverse operations. * Some story problems require more than one operations to solve. Visualizing a mathematical situation can help make sense of a story problem * An equation can be used to represent a story problem. A letter in an equation represents an unknown quantity. * Rounding is changing numbers to “friendlier” numbers to make it easier to add and subtract. * Estimation is using rounded numbers to make sure a sum or difference is close of the actual answer when an exact answer is not needed or to make sure an exact answer is close to what it should be. * We can use different strategies to add or subtract multi-digit numbers. * We use place value to add and subtract when we break numbers apart into hundreds, tens, and ones. * We can use properties of operations (commutative, associative) to add and subtract because sometimes changing the order of the numbers makes them easier to add or subtract. * We can use the inverse relationship between addition and subtraction to help us solve problems. | **Students will be able to:**   * Say multiples of 100 that are greater than 1,000. * Mentally add and subtract multiples of 10. * Accurately add and subtract multiples of 10 and 100. * Break numbers apart to solve problems. * Choose a strategy to add or subtract and use it efficiently. * Use representations such as 1,000 chart and number line to solve problems. * Write a story that involves a subtraction situation. * Accurately and quickly solve mentally the subtraction facts related to the addition combinations to 10+10. * Solve 2 step 3-digit addition and subtraction problems accurately. * Solve 2-step word problems using two of the four operations for whole numbers (addition, subtraction, multiplication, division). |
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| **Investigation 1**  **Duration: 5 days** | | | |
| **Day** | **Student I Will Statements** | **Supporting Accountable Talk** | **Assessment** |
| **1.1** | * I will combine hundreds to numbers above 1,000. * I will subtract from multiples of 100. * I will read and write numbers in the thousands. | * The next multiple of 100 is \_\_\_\_\_. * If you combined \_\_\_, \_\_\_, and \_\_\_, you would have \_\_\_\_. * The subtraction strategy I used was \_\_\_\_\_. | Student Activity Book (SAB) page 4 (Paperclip Problems) provides an assessment of students’ abilities to solve problems that involve combining and then subtracting from groups of 100s. As students’ work is analyzed, reference the ongoing assessment questions on page 34. |
| **1.2** | * I will subtract from multiples of 100. * I will add multiples of 10 and 100 to, and subtracting them from, 3-digit numbers. | * The amount of positive change is \_\_\_. The amount of negative change is \_\_\_. * I recognized that the digit in the \_\_\_ place did not change because \_\_\_\_\_. | The ongoing assessment questions (page 39) will help determine students’ abilities to add and subtract single digit numbers and multiples of 10 and 100 as they play *Capture from 300 to 600.* |
| **1.3** | * I will add multiples of 10 and 100 to, and subtracting them from, 3-digit numbers. * I will estimate answers to subtraction problems with 3-digit numbers. * I will use the relationship of numbers in a subtraction expression to multiples of 100 to solve subtraction problems. | * The relationship between the problems in the set are \_\_\_\_. * The tool I used to solve the problem is \_\_\_\_. I selected this tool because \_\_\_. | SAB page 13 (How Many Students?) provides an assessment of students’ abilities to subtract from 100 and multiples of 100, and from numbers near a multiple of 100. As students’ work is analyzed, reference the ongoing assessment questions on page 44. |
| **1.4** | * I will use story contexts and representations to support explanations about how changing a number in a subtraction problem affects the difference. * I will use the relationship of numbers in a subtraction expression to multiples of 100 to solve subtraction problems. * I will fluently solve multiplication combinations with products of 50. | * The strategy used to solve the first problem is \_\_\_\_\_\_. * The first problem is related to the second problem by \_\_\_\_. * Another problem that is like this problem is \_\_\_\_. * The mathematical reasoning I applied to this problem was \_\_\_\_. | Omit multiplication assessment as it does not relate to the lessons in Unit 8.  Student Activity Book (SAB) page 15 (More Related Subtraction Problems) provides an assessment of students’ abilities to solve problems that involve subtracting problems that involve two and three digit numbers. As students’ work is analyzed, reference the ongoing assessment questions on page 53. |
| **1.5** | * I will subtract from multiples of 100. * I will add multiples of 10 and 100 to, and subtract them from, 3-digit numbers. * I will use the relationship of numbers in a subtraction expression to multiples of 100 to solve subtraction problems. | * The first problem is related to the second problem by \_\_\_\_. * Another problem that is like this problem is \_\_\_\_. * The mathematical reasoning I applied to this problem was \_\_\_\_. | Utilize the Assessment: Problems About Capture from 300 to 600 (M23) as an informal assessment of students’ abilities to add and subtract multiples of 10 and 100. As you analyze student work, reference the ongoing assessment questions on page 59. |

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| **Investigation 2**  **Duration: 5 days** | | | |
| **Day** | **Student I Will Statements** | **Supporting Accountable Talk** | **Assessment** |
| **2.1** | * I will solve addition problems by changing the numbers to create an equivalent problem that is easier to solve. * I will use story contexts and representations to support explanations about equivalent addition expressions. | * I made this problem easier by \_\_\_\_\_. * Another idea I can generate is \_\_\_\_\_. * A representation or story context that shows how adding and then subtracting the same amount does not change the sum is \_\_\_\_\_. * I changed the expression to make an equivalent expression by \_\_\_\_\_. | While students complete the math workshop activities, reference the ongoing assessment questions on page 68 to assess students’ abilities to use representations to prove that when some amount has been added to one addend in an addition expression and the same amount has been subtracted from the second addend, the sum does not change. |
| **2.2** | * I will solve addition problems with 3-digit numbers. * I will estimate and solve addition problems with sums greater than 1,000. * I will identify addition strategies by focusing on how each strategy starts. | * A different way you could start solving this problem is \_\_\_. * The next step I will take is \_\_\_\_. * I solved the problem mentally by \_\_\_\_. * I know my solution is accurate because \_\_\_\_. | SAB page 24 (Adding Starter Problems) provides an assessment of students’ abilities to solve addition problems using starter problems As students’ work is analyzed, reference the ongoing assessment questions on page 76. |
| **2.3** | * I will solve addition problems with 3-digit numbers. * I will identify addition strategies by focusing on how each strategy starts. | * I recognized the number relationship between \_\_\_\_. * I made this problem easier to solve by \_\_\_\_. * The strategy used to solve this problem is \_\_\_\_\_. | SAB page 28 (Solving Addition Problems) provides an assessment of students’ abilities to solve addition problems with 3-digit numbers. As students’ work is analyzed, reference the ongoing assessment questions on page 80. |
| **2.4** | * I will solve addition problems with more than 2 addends. * I will solve addition problems with 3-digit numbers. | * \_\_\_\_ is a reasonable estimate because \_\_\_\_. * I decided to start there \_\_\_\_. * After the first step I have \_\_\_\_ left to complete. * The thinking I used to solve this problem is \_\_\_. | SAB page 31 (Adding More Than Two Numbers) provides an assessment of students’ abilities to solve addition problems with more than two addends. As students’ work is analyzed, reference the ongoing assessment questions on page 87. |
| **2.5** | * I will solve addition problems with more than 2 addends. * I will solve addition problems with 3-digit numbers. | * I solved this problem by \_\_\_. | Utilize the Assessment: Addition Strategies (M40) as an informal assessment of students’ abilities to use multiple strategies to solve addition problems. As you analyze student work, reference pages 156-159 in your Teacher’s Manual. |

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| **Investigation 3**  **Duration: 4 days** | | | |
| **Day** | **Student I Will Statements** | **Supporting Accountable Talk** | **Assessment** |
| **3.1** | * I will solve addition problems with 3-digit numbers. * I will solve subtraction problems that involve comparison, removal, or finding a missing part. * I will estimate which of two sums is greater. | * The strategy I used for finding the difference between \_\_\_ and \_\_\_ is \_\_\_\_. * I know that \_\_\_ collection has more because \_\_\_\_. | The ongoing assessment questions (page 105) will help determine students’ abilities to compare two pairs of 2- and 3-digit numbers to determine the larger sum as they play *Collections Compare.* |
| **3.2** | * I will solve subtraction problems that involve comparison, removal, or finding a missing part. * I will use the relationship of numbers in a subtraction expression to multiples of 100 to solve subtraction problems. | * I used the map to help me find \_\_\_\_. * The strategy I used to solve this problem is \_\_\_\_. | SAB page 42 (The Oregon Trail) provides an assessment of students’ abilities to solve subtraction problems that involve finding the distance in miles between one place and another. As students’ work is analyzed, reference the ongoing assessment questions on page 111. |
| **3.3** | * I will subtract 3-digit numbers by using strategies that involve either subtracting one number in parts, adding up, or subtracting back. * I will solve subtraction problems that involve comparison, removal, or finding a missing part. * I will represent solutions to subtraction problems with number lines, 1,000 charts, and/or story contexts. | * I know my situation involves taking away because \_\_\_. * I know my situation involves comparing two things because \_\_\_. * I know my situation involves finding the missing part of a whole because \_\_\_\_. | Utilize the Assessment: Subtraction Strategies (M52) as an informal assessment of students’ abilities to solve subtraction problems with 3-digit numbers. As you analyze student work, reference pages 165-167 in your Teacher’s Manual. |
| **3.6** | * I will solve subtraction problems that involve comparison, removal, or finding a missing part. * I will subtract 3-digit numbers by using strategies that involve either subtracting one number in parts, adding up, or subtracting back. * I will represent solutions to subtraction problems with number lines, 1,000 charts, and/or story contexts. | * My partner’s solution is similar/different by \_\_\_\_\_. | SAB page 56 (Solving Subtraction Problems) provides an assessment of students’ abilities to solve subtraction problems with 3-digit numbers. As students’ work is analyzed, reference the ongoing assessment questions on page 133. |

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| **Multi-Step Problems**  **Duration: 4 days** | | | |
| **Day** | **Student I Will Statements** | **Supporting Accountable Talk** | **Assessment** |
| **1** | * I will solve two-step word problems using two of the four operations for whole numbers. * I will use models and drawings to represent and solve two-step word problems. | * I know my problem involves \_\_\_\_ (operation) and \_\_\_\_ (operation) because \_\_\_\_. * My partner’s solution is similar/different by \_\_\_\_\_. | Informally assess students as they complete *Trip to the State Fair*.  Questions to consider as students work:  Can students explain/justify their solution strategy to their partner?  Do students use a variety of solution strategies to solve the problems?  Do students label each step and answer?  Do students use models or drawings to represent and solve the problems? |
| **2** | * I will solve two-step word problems using two of the four operations for whole numbers. * I will use models and drawings to represent and solve two-step word problems. | * I know my problem involves \_\_\_\_ (operation) and \_\_\_\_ (operation) because \_\_\_\_. * My partner’s solution is similar/different by \_\_\_\_\_. | Informally assess students as they solve two-step problems [page](https://drive.google.com/a/cms.k12.nc.us/file/d/0B96QozheU4WYNnF2VEZ2b1luNGc/view?usp=sharing) 40  Questions to consider as students work:  Can students explain/justify their solution strategy to their partner?  Do students use a variety of solution strategies to solve the problems?  Do students label each step and answer?  Do students use models or drawings to represent and solve the problems? |
| **3** | * I will solve two-step word problems using two of the four operations for whole numbers. * I will use models and drawings to represent and solve two-step word problems. * I will solve two-step problems using letters to represent an unknown. | * I know my problem involves \_\_\_\_ (operation) and \_\_\_\_ (operation) because \_\_\_\_. * My partner’s solution is similar/different by \_\_\_\_\_. | Informally assess students as they solve two-step problems during math workshop.  Questions to consider as students work:  Can students explain/justify their solution strategy to their partner?  Do students use a variety of solution strategies to solve the problems?  Do students label each step and answer?  Do students use models or drawings to represent and solve the problems? |
| **4** | * I will solve two-step word problems using two of the four operations for whole numbers. * I will use models and drawings to represent and solve two-step word problems. * I will solve two-step problems using letters to represent an unknown. | * I know my problem involves \_\_\_\_ (operation) and \_\_\_\_ (operation) because \_\_\_\_. * My partner’s solution is similar/different by \_\_\_\_\_. | Informally assess students as they solve two-step problems during math workshop.  Questions to consider as students work:  Can students explain/justify their solution strategy to their partner?  Do students use a variety of solution strategies to solve the problems?  Do students label each step and answer?  Do students use models or drawings to represent and solve the problems? |

# **CMS Measurement Unit**

*Estimated Duration: 10 days (April 14, 2017 – April 28, 2017)*

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| **Expectations for Students at the End of the Unit** | |
| **Students will know:**   * A same-size unit is repeated to determine the length, capacity, or weight of an object. * We find the length of objects using the units inches and feet. * We find the liquid volume using the unit liters and milliliters. * We find the mass of objects using the units grams and kilograms. * If the unit used to measure is smaller it takes more to measure the object than a larger unit would take. Likewise, if a larger unit is used to measure an object, it will take fewer than a smaller unit. (bunny hops, giant jumps) * Larger units can be divided into equivalent units (feet↔inches; We add and subtract like units in order to find a sum and difference. | **Students will be able to:**   * Estimate and compare liquid volumes. * Estimate and compare mass. * Make connections to everyday items to build understanding of liquid volume and the liter. * Choose appropriate measurement units to measure mass and volume. * Solve word/story problems involving measurement units. |
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| **CMS Unit: Measuring Liquid Volume, Mass, and Elapsed Time**  **Estimated Duration: 10 days** | | | |
| **Session** | **Student I Will Statements** | **Supporting Accountable Talk** | **Assessment** |
| **1** | * I will estimate the volume using liters. * I will order containers from least capacity to greatest capacity. | * I estimate that \_\_\_\_ holds more/less than a\_\_\_\_\_ because \_\_\_\_\_. * I placed the containers in this order because \_\_\_. * It was easy to estimate a liter because \_\_\_\_\_. * Some containers were hard to estimate because \_\_\_\_\_. | After completing the activities in the lesson, show 3-4 containers. Students will estimate the capacity of each container - more than a liter or less than a liter. Show a container that holds 1-2 gallons. Have students determine how many liters the container could hold. This activity will build students’ ability to estimate liquid volume. |
| **2** | * I will estimate liquid volume using liters. | * Estimates help me determine liquid volume by \_\_\_\_\_\_. * A way I can measure liquid volume is \_\_\_\_\_\_\_. | As students work, use the formative assessment questions on page 10 to assess students’ ability to estimate and to compare liquid volume measurements. |
| **3**  **Unit 9 4A.1** | * I will understand measures of liquid volume. * I will estimate and measure liquid volume. * I will solve story problems involving liquid volume. | * I know \_\_\_\_\_\_\_ holds about a liter because \_\_\_\_\_\_\_\_\_\_. * When solving story problems with liquid volume I must be sure to \_\_\_. | Student Activity Book (SAB) page 36 (Story Problems about Liquid Volume) question 4 assesses students’ understanding of solving story problems involving liquid volume. Use the ongoing assessment questions on page CC76 to analyze the strategies students use.  SAB page 35 (Units for Measuring Liquid Volume) assesses students’ ability to determine the appropriate unit of measurement. Use the ongoing assessment questions on page CC75 to analyze student work. |
| **4** | * I will estimate the weight of everyday items using grams and kilograms.. * I will find items/materials that weigh about a kilogram or a gram. | * A kilogram is about as heavy as a \_\_\_\_\_\_\_. * It is important to have a standard unit of weight because \_\_\_. * To determine the weight of \_\_\_\_\_\_\_ I could \_\_\_. | As students work, use the essential and formative assessment questions to assess students’ understanding of weight and mass. |
| **5** | * I will estimate and weigh objects using a spring scale. * I will experiment with gram and kilogram weights. | * Grams and kilograms are related by \_\_\_\_\_\_\_\_\_. The difference between these two units is \_\_\_\_\_. * \_\_\_\_\_ weighs about a gram. \_\_\_\_\_ weighs about kilogram. * When an item's measurement unit is changed \_\_\_\_\_\_\_\_\_. * It is important to associate items with a weight because \_\_\_\_\_\_\_\_. | Complete the estimation and weight scavenger hunt for one item as a class. (Use the student chart on page 24.) Then, have students complete the scavenger with a partner. Use the formative assessment questions on page 24 to assess students’ ability to estimate the weight of and to weigh objects. |
| **6**  **Unit 9 4A.2** | * I will understand measures of weight and mass. * I will estimate and measure weight and mass. * I will solve story problems involving weight and mass. | * \_\_\_\_\_ weighs about a \_\_\_\_\_\_. I know this because \_\_\_. * When solving story problems with mass I must be sure to \_\_\_\_\_. | Student Activity Book (SAB) page 39 (Story Problems about Weight and Mass) question 4 assesses students’ understanding of solving story problems involving weight and mass. Use the ongoing assessment questions on page CC80 to analyze the strategies students use.  SAB page 40 (Weight and Mass) assesses students’ ability to determine the appropriate unit of measurement. Use the ongoing assessment questions on page CC78 to analyze student work. |
| **7** | * I will tell time to the minute on an analog and digital clock. * I will find how many minutes to the next hour. | * I know there are \_\_\_ minutes to the next hour. | Show students several times on an analog clock. For each time, have students record the time and how many minutes to the next hour. |
| **8** | * I will solve problems about starting time, elapsed time, and ending time. * I will use a time line to help solve problems about time. | * The start time is \_\_\_ and the end time is \_\_\_. So the time used is \_\_\_\_. I know this because \_\_\_\_\_. * The start time is \_\_\_ and the elapsed time is \_\_\_. So the time ended is \_\_\_\_. I know this because \_\_\_\_\_. * The time used is \_\_\_ and the end time is \_\_\_. So the time started is \_\_\_\_. I know this because \_\_\_\_\_. | Use Elapsed Time Exit Ticket |
| **9** | * I will solve problems about starting time, elapsed time, and ending time. * I will use a time line to help solve problems about time. | * The start time is \_\_\_ and the end time is \_\_\_. So the time used is \_\_\_\_. I know this because \_\_\_\_\_. * The start time is \_\_\_ and the elapsed time is \_\_\_. So the time ended is \_\_\_\_. I know this because \_\_\_\_\_. * The time used is \_\_\_ and the end time is \_\_\_. So the time started is \_\_\_\_. I know this because \_\_\_\_\_. | Exit Ticket:  Have students answer the following problems:  1. Melanie went to lunch at 11:40. She finished lunch at 12:11. How many minutes did Melanie eat?  2. Joel’s class went to PE at 8:25. They were in PE for 54 minutes. At what time did Joel’s class leave PE? |