

Seymour Public Schools Math Grade 4 Unit 3

<p>Grade: 4</p> <p>Unit 3- Algebraic Thinking using Numbers and Operations with Division Involving Whole Numbers</p>	<p>Subject: Math</p> <ul style="list-style-type: none"> • Time Frame: 17 days • Domains: Number and Operations in Base Ten, Operations and Algebraic Thinking 	
<p>Standards</p>	<p>Content Standards: 4.NBT.3, 4.NBT.6, 4.OA.3 http://www.corestandards.org/wp-content/uploads/Math_Standards.pdf</p>	<p>Practice Standards: MP 1, 2, 3, 4, 5, 6, 7, 8</p>
<p>Enduring Understandings</p>	<ol style="list-style-type: none"> 1. You can use visual arrays and rectangle diagrams to represent multiplication to help solve division problems. 2. You can divide greater numbers by using the division algorithm. 3. You can use strategies to solve problems involving interpreting the remainder. 	
<p>Essential Questions</p>	<ol style="list-style-type: none"> 1. How do you use multiplication patterns to divide with zeros or remainders? 2. How can you use multiplication methods to divide? 3. How do you divide with 2-digit and 4-digit quotients? 4. How do you use the digit-by-digit method to divide? 5. How do you divide with 4-digit dividends? 6. How do you determine the correct-size multiplier for a division quotient? 7. How can you use rounding and estimation to check quotients? 8. How do you interpret remainders in division? 9. How do you solve word problems with mixed operations? 10. When do you use division in real world problem solving situations? 	
<p>Vocabulary</p>	<p>divisor, quotient, dividend, remainder</p>	

Priority and Supporting CCSS	Explanations and Examples*
<p>4.NBT.3. Use place value understanding to round multi-digit whole numbers to any place.*</p> <p>* Grade 4 expectations in this domain are limited to whole numbers less than or equal to 1,000,000.</p>	<p>4.NBT.3. When students are asked to round large numbers, they first need to identify which digit is in the appropriate place. Example: Round 76,398 to the nearest 1000.</p> <ul style="list-style-type: none"> • Step 1: Since I need to round to the nearest 1000, then the answer is either 76,000 or 77,000. • Step 2: I know that the halfway point between these two numbers is 76,500. • Step 3: I see that 76,398 is between 76,000 and 76,500. • Step 4: Therefore, the rounded number would be 76,000.

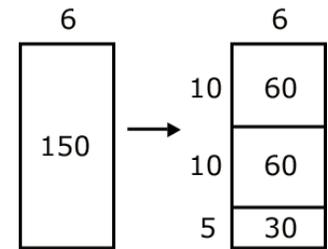
Priority and Supporting CCSS	Explanations and Examples*
<p>4.NBT.6. Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.*</p> <p>* Grade 4 expectations in this domain are limited to whole numbers less than or equal to 1,000,000.</p>	<p>4.NBT.6 In fourth grade, students build on their third grade work with division within 100. Students need opportunities to develop their understandings by using problems in and out of context.</p> <p>Examples: A 4th grade teacher bought 4 new pencil boxes. She has 260 pencils. She wants to put the pencils in the boxes so that each box has the same number of pencils. How many pencils will there be in each box?</p> <ul style="list-style-type: none"> • <u>Using Base 10 Blocks</u>: Students build 260 with base 10 blocks and distribute them into 4 equal groups. Some students may need to trade the 2 hundreds for tens but others may easily recognize that 200 divided by 4 is 50. • <u>Using Place Value</u>: $260 \div 4 = (200 \div 4) + (60 \div 4)$ • <u>Using Multiplication</u>: $4 \times 50 = 200$, $4 \times 10 = 40$, $4 \times 5 = 20$; $50 + 10 + 5 = 65$; so $260 \div 4 = 65$ • <u>Using an Open Array or Area Model</u> After developing an understanding of using arrays to divide, students begin to use a more abstract model for division. This model connects to

*Source – Connecticut Core Standards for Mathematics as adapted from the Arizona Academic Content Standards

a recording process that will be formalized in the 5th grade.

Example 1: $150 \div 6$

Students make a rectangle and write 6 on one of its sides. They express their understanding that they need to think of the rectangle as representing total of 150.



[Example 1: $150 \div 6$]

1. Students think, 6 times what number is close to 150? They recognize that 6×10 is 60, so they record 10 as a factor and partition the rectangle into 2 rectangles and label the area aligned to the factor of 10 with 60. They express that they have only used 60 of the 150, so they have 90 left.
2. Recognizing that there is another 60 in what is left, they repeat the process above. They express that they have used 120 of the 150, so they have 30 left.
3. Knowing that 6×5 is 30, they write 30 in the bottom area of the rectangle and record 5 as a factor.

	<p>4. Students express their calculation in various ways:</p> <p>a. $150 \div 6 = 10 + 10 + 5 = 25$</p> $\begin{array}{r} 150 \\ - 60 \quad (6 \times 10) \\ \hline 90 \\ - 60 \quad (6 \times 10) \\ \hline 30 \\ - 30 \quad (6 \times 5) \\ \hline 0 \end{array}$ <p>b. $150 \div 6 = (60 \div 6) + (60 \div 6) + (30 \div 6)$ $= 10 + 10 + 5 = 25$</p> <p>Example 2: $1917 \div 9$</p> <p>A student's description of his or her thinking may be: I need to find out how many 9s are in 1917. I know that 200×9 is 1800. So if I use 1800 of the 1917, I have 117 left. I know that 9×10 is 90. So if I have 10 more 9s, I will have 27 left. I can make 3 more 9s. I have 200 nines, 10 nines and 3 nines. So I made 213 nines. $1917 \div 9 = 213$.</p> <div style="display: flex; align-items: center;"> <div style="flex: 1;"> <p>Students may use digital tools to express ideas.</p> </div> <div style="border: 1px solid black; padding: 5px; margin-left: 10px;"> <div style="text-align: center; margin-bottom: 5px;">9</div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px; text-align: center;">1800</div> <div style="border: 1px solid black; padding: 5px; text-align: center;">90</div> <div style="margin-left: 5px; margin-top: 5px;">← 27</div> </div> </div>
--	---

Priority and Supporting CCSS	Explanations and Examples*
<p>4.OA.3. Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.</p>	<p>4.OA.3. Students need many opportunities solving multistep story problems using all four operations.</p> <p>An interactive whiteboard, document camera, drawings, words, numbers, and/or objects may be used to help solve story problems.</p> <p>Example: Chris bought clothes for school. She bought 3 shirts for \$12 each and a skirt for \$15. How much money did Chris spend on her new school</p>

	<p>clothes?</p> $3 \times \$12 + \$15 = \underline{\quad}$ <p>In division problems, the remainder is the whole number left over when as large a multiple of the divisor as possible has been subtracted.</p> <p>Example:</p> <p>Kim is making candy bags. There will be 5 pieces of candy in each bag. She had 53 pieces of candy. She ate 14 pieces of candy. How many candy bags can Kim make now? (7 bags with 4 leftover)</p> <p>Kim has 28 cookies. She wants to share them equally between herself and 3 friends. How many cookies will each person get? (7 cookies each)</p> $28 \div 4 = \underline{\quad}$ <p>There are 29 students in one class and 28 students in another class going on a field trip. Each car can hold 5 students. How many cars are needed to get all the students to the field trip? (12 cars, one possible explanation is 11 cars holding 5 students and the 12th holding the remaining 2 students) $29 + 28 = 11 \times 5 + 2$</p> <p>Estimation skills include identifying when estimation is appropriate, determining the level of accuracy needed, selecting the appropriate method of estimation, and verifying solutions or determining the reasonableness of situations using various estimation strategies.</p> <p>Estimation strategies include, but are not limited to:</p> <ul style="list-style-type: none">• front-end estimation with adjusting (using the highest place value and estimating from the front end, making adjustments to the estimate by taking into account the remaining amounts),• clustering around an average (when the values are close together an average value is selected and multiplied by the number of values to determine an estimate),
--	--

- rounding and adjusting (students round down or round up and then adjust their estimate depending on how much the rounding affected the original values),
- using friendly or compatible numbers such as factors (students seek to fit numbers together - e.g., rounding to factors and grouping numbers together that have round sums like 100 or 1000),
- using benchmark numbers that are easy to compute (students select close whole numbers for fractions or decimals to determine an estimate).

Seymour Public Schools Math Grade 4 Unit 3

Resources

Math Expressions – Unit 3, Lessons 1-11
Thinkcentral.com
Soar to Success Math Intervention
Mega Math
Common Core Mathematics- Newmark Learning Book- Units-11 & 12
Xtramath.org
Learnzillion.com
Mobymax.com

Unit Assessment

Unit Test
Quick Quizzes
Formative Assessments
Performance Task
Assessments from other sources:
<https://grade4commoncoremath.wikispaces.hcpss.org/4.OA.2>
<https://grade4commoncoremath.wikispaces.hcpss.org/4.OA.3>
<https://grade4commoncoremath.wikispaces.hcpss.org/4.NBT.5>
<https://grade4commoncoremath.wikispaces.hcpss.org/4.NBT.6>

Technology: Videos, Websites, Links

<http://elemmath.jordandistrict.org/teachers/4thgrade/>

<https://grade4commoncoremath.wikispaces.hcpss.org/>

<http://www.mathworksheetsland.com/>