Grade: 4 **Unit 1—Multi-Digit Whole Numbers**	**Subject: Math** • **Time Frame: 21 days** • **Domain: Numbers in Base Ten, Measurement and Data, Operations and Algebraic Thinking**	
Standards	Content Standards: 4.NBT.1, 4.NBT.2, 4.NBT.3, 4.NBT.4, 4.MD.2, 4.OA.3 http://www.corestandards.org/wp-content/uploads/Math_Standards.pdf	Practice Standards: MP 1, 2, 3, 5, 6, 7
Enduring Understandings	1. In a multi-digit whole number, a digit in one place represents ten times what it would represent in the place immediately to the right. This is similar to bundling tens and hundreds in primary grades. 2. Understanding place value can lead to number sense and efficient strategies for computation. 3. The standard algorithm for addition means you start with the ones column and then regroup as necessary. 4. The standard algorithm for subtraction means you start with the ones column and regroup, if necessary. 5. The standard algorithm is useful when numbers aren't easy to compute with alternatives strategies including mental math. 6. Place value helps us communicate and compare quantity. 7. Understanding place value can lead to number sense and efficient strategies for computing with numbers.	
Essential Questions	1. How can strategies be used to add and subtract multi-digit whole numbers? 2. How can you use estimation and mental math to solve addition and subtraction problems? 3. How can numbers be expressed in expanded form? 4. How can you compare whole numbers? 5. How can you round whole numbers? 6. How does a digit's position affect its value? 7. When is regrouping needed in addition and subtraction?	
Vocabulary	Dot array, greater than >, less than <, digit, difference, inverse operation, addend, groups, sum	

Priority and Supporting CCSS	Explanations and Examples*
4. NBT.2. Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two multi-digit numbers based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons. * * Grade 4 expectations in this domain are limited to whole numbers less than or equal to 1,000,000.	**4.NBT.2.** The expanded form of 275 is 200 + 70 + 5. Students use place value to compare numbers. For example, in comparing 34,570 and 34,192; a student might say, both numbers have the same value of 10,000s and the same value of 1000s; however, the value in the 100s place is different so that is where I would compare the two numbers.
4. NBT.1. Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right. *For example, recognize that 700 ÷ 70 = 10 by applying concepts of place value and division.* * * **Grade 4 expectations in this domain are limited to whole numbers less than or equal to 1,000,000.**	**4.NBT.1**. Students should be familiar with and use place value as they work with numbers. Some activities that will help students develop understanding of this standard are: • Investigate the product of 10 and any number, then justify why the number now has a 0 at the end. (7 x 10 = 70 because 70 represents 7 tens and no ones, 10 x 35 = 350 because the 3 in 350 represents 3 hundreds, which is 10 times as much as 3 tens, and the 5 represents 5 tens, which is 10 times as much as 5 ones.) While students can easily see the pattern of adding a 0 at the end of a number when multiplying by 10, they need to be able to justify why this works. • Investigate the pattern, 6, 60, 600, 6,000, 60,000, 600,000 by dividing each number by the previous number.
4 .NBT.3. Use place value understanding to round multi-digit whole numbers to any place. [2*] [*2] **Grade 4 expectations in this domain are limited to whole numbers less than or equal to 1,000,000.**	**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. • 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.

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

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4. OA.3. Solve multi-step 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.	**4. OA.3.** Students need many opportunities solving multi-step story problems using all four operations. An interactive whiteboard, document camera, drawings, words, numbers, and/or objects may be used to help solve story problems. 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 clothes? $3 \times \$12 + \$15 = \_\_\_$ In division problems, the remainder is the whole number left over when as large a multiple of the divisor as possible has been subtracted. Example: 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) 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) $28 \div 4 = \_\_\_$ 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) $29 + 28 = 11 \times 5 + 2$

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	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. Estimation strategies include, but are not limited to: • 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).
4. NBT.4. Fluently add and subtract multi-digit whole numbers using the standard algorithm.	**4.NBT.4.** Students build on their understanding of addition and subtraction, their use of place value and their flexibility with multiple strategies to make sense of the standard algorithm. They continue to use place value in describing and justifying the processes they use to add and subtract. When students begin using the standard algorithm their explanation may be quite lengthy. After much practice with using place value to justify their steps, they will develop fluency with the algorithm. Students should be able to explain

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	why the algorithm works. 3892 + 1567 Student explanation for this problem: 1. Two ones plus seven ones is nine ones. 2. Nine tens plus six tens is 15 tens. 3. I am going to write down five tens and think of the10 tens as one more hundred.(notates with a 1 above the hundreds column) 4. Eight hundreds plus five hundreds plus the extra hundred from adding the tens is 14 hundreds. 5. I am going to write the four hundreds and think of the 10 hundreds as one more 1000. (notates with a 1 above the thousands column) 6. Three thousands plus one thousand plus the extra thousand from the hundreds is five thousand. 3546 - 928 Student explanation for this problem: 1. There are not enough ones to take 8 ones from 6 ones so I have to use one ten as 10 ones. Now I have 3 tens and 16 ones. (Marks through the 4 and notates with a 3 above the 4 and writes a 1 above the ones column to be represented as 16 ones.) 2. Sixteen ones minus 8 ones is 8 ones. (Writes an 8 in the ones column of answer.) 3. Three tens minus 2 tens is one ten. (Writes a 1 in the tens column of answer.) 4. There are not enough hundreds to take 9 hundreds from 5 hundreds so I have to use one thousand as 10 hundreds. (Marks through the 3

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	and notates with a 2 above it. (Writes down a 1 above the hundreds column.) Now I have 2 thousand and 15 hundreds. 5. Fifteen hundreds minus 9 hundreds is 6 hundreds. (Writes a 6 in the hundreds column of the answer.) 6. I have 2 thousands left since I did not have to take away any thousands. (Writes 2 in the thousands place of answer.) Note: Students should know that it is mathematically possible to subtract a larger number from a smaller number but that their work with whole numbers does not allow this as the difference would result in a negative number.

4. MD.2. Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.	Example with addition and subtraction: Addition: Mason ran for an hour and 15 minutes on Monday, 25 minutes on Tuesday, and 40 minutes on Wednesday. What was the total number of minutes Mason ran? Subtraction: A pound of apples costs $1.20. Rachel bought a pound and a half of apples. If she gave the clerk a $5.00 bill, how much change will she get back? Number line diagrams that feature a measurement scale can represent measurement quantities. Examples include: ruler, diagram marking off distance along a road with cities at various points, a timetable showing hours throughout the day, or a volume measure on the side of a container.

Resources
Math Expressions - Unit 1, Lessons 1-14 Thinkcentral.com Soar to Success Math Intervention Mega Math Destination Math Common Core Mathematics-Newmark Learning- Units-2 ,5, 6, 7 Xtramath.org Learnzillion.com Mobymax.com

Unit Assessments
Unit Test Quick Quizzes Formative Assessments Performance Task Assessment from other sources: https://grade4commoncoremath.wikispaces.hcpss.org/Assessing+4.NBT.1 https://grade4commoncoremath.wikispaces.hcpss.org/Assessing+4.NBT.2 https://grade4commoncoremath.wikispaces.hcpss.org/Assessing+4.NBT.3 https://grade4commoncoremath.wikispaces.hcpss.org/Assessing+4.NBT.4

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