Dear Parents,
We will begin our next unit of study in math soon. The information below will serve as an overview of the unit as you work to support your child at home. If you have any questions, please feel free to contact me. I appreciate your ongoing support.

Sincerely,
Your Child's Teacher

Unit Name: Use Place Value Strategies to Add and Subtract Whole Numbers

North Carolina Content State Standards:

NC.4.NBT.1
Explain that in a multi-digit whole number, a digit in one place represents 10 times as much as it represents in the place to its right, up to 100,000.

NC.4.NBT.2
Read and write multi-digit whole numbers up to and including 100,000 using numerals, number names, and expanded form.

NC.4.NBT.7
Compare two multi-digit numbers up to and including 100,000 based on the values of the digits in each place, using >, =, and < symbols to record the results of the comparisons.

NC.4.NBT.4
Add & subtract multi-digit whole numbers up to and including 100,000 using the standard algorithm with place value understanding.

NC.4.OA.3
Solve two-step word problems involving the four operations with whole numbers.
- Use estimation strategies to assess reasonableness of answers
- ~~Interpret remainders in word problems~~
- Represent problems using equations with a letter standing for the unknown quantity.

Supporting Standards:

NC.4.OA.1 Interpret a multiplication equation as comparison. Multiply or divide to solve word problems involving multiplicative comparisons using models and equations with a symbol for the unknown number. Distinguish multiplicative comparison from additive comparison.

NC.4.MD.8
Solve word problems involving addition and subtraction of time intervals that cross the hour.

Math Language:

Place	Value	Digit	Ones
Tens	Hundreds	Thousands	Ten Thousand
Hundred Thousands	Millions	Ten Times	Compare (<,>,=)
Subtotals	Regroup	Ungroup	Unit
Base Ten System	Expanded Form	Expanded Notation	Estimate
Addition	Sum (Total)	Addend	Subtraction
Difference	Standard Algorithm	Rounding	Reasonable
Place Value	Multi-digit	Computation	Rate of 10
Equation	Variable	Operation	Unknown
Situation	Comparison	Table	Time Interval
Number Line	Hour	Minutes	Rate

Unit Overview:

In this unit, students work with larger numbers up to and including 100,000. The focus of this unit is to build an understanding of place value and numbers, using this knowledge to read, write, and compare numbers. Students will build on their understanding of place value to the thousands place in order to expand their understanding to the millions place. This is the first time students will be exposed to the concept of the place of the digit/number to the left is 10 times larger than the place of the digit/number to the right. Students will be asked to reason about numbers using place value symbols >, <, and =. Students will also need to understand how to manipulate numbers into various expanded forms in order to flexibly add, subtract, multiply and divide. For example, the student should understand 285 = 200 + 80 + 5; or 285 = 28 tens and 5 ones; or 285 = 18 tens and 105 ones; etc. They will apply their understanding of place value to help solve multi-step word problems with addition and subtraction. Students will utilize estimation as part of the problem solving process. One example is students rounding to the nearest leading digit. This will help students to check their solution or answer after solving to see if it is reasonable.

Skills/Strategies:

Students will be able to:

- Read, write and name multi-digit whole numbers in standard, expanded, and word form
- Connect the expanded form to understandings of place value
- Compare two multi-digit numbers up to 100,000 using the symbols <, >, =
- Write comparisons in number sentences using greater than, less than or equals symbol
- Use the standard algorithm to add and subtract numbers in the context of one and two step word problems within 100,000
- Use the four operations to solve two-step word problems
- Anticipate and assess the reasonableness of solutions through estimation
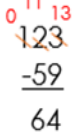
Addition

So far this year, we have been strengthening our mental math skills. When students add mentally, they use place value understanding to solve problems efficiently. Once they have those skills in place, they are ready for the standard algorithm. Consider the progression below. Notice how the mental math strategies lead to a better understanding of the procedures associated with the standard addition algorithm.

Making Tens With this mental strategy, students break numbers apart quickly to make tens in order to add efficiently.	**Adding Chunks** This mental strategy keeps one addend whole while breaking apart the other addend into manageable pieces.	**Partial Sums** Students will write each addend in expanded form. Then, they will add like place values together, eventually leading to a final sum.	**Standard Algorithm** Students will use their conceptual understanding of addition and place value knowledge to move to the traditional algorithm to solve addition problems.
Example: 117 + 119 (110 + 7) + (110 + 9) 110 + 110 + (7 + 3) + 6 110 + 110 + 10 + 6 230 + 6 = 236 *The nine is decomposed into 3 + 6 in order to add three to seven to make ten.*	Example: 117 + 119 117 + (100 + 10 + 3 + 6) 117 + 100 = 217 217 + 10 = 227 227 + 3 = 230 230 + 6 = 236 The 119 is decomposed by into 100 + 10 + 3 + 6 to make adding easier.	Example: 117 + 119 (100 + 10 + 7) + (100 + 10 + 9) 100 + 100 = 200 10 + 10 = 20 7 + 9 = 16 20 + 16 = 36 200 + 36 = 236 Both the 117 and the 119 have been decomposed by place value. Then common places were added together to get a total.	Example: 117 + 119 $\begin{array}{r} {}^{+1} \\ 117 \\ + 119 \\ \hline 236 \end{array}$ When students add the 7 and 9, they understand the answer is 16. So, when they "carry" (Note: we now use the word "regroup") the one, they are actually decomposing the 16 into 10 and 6, bringing the 10 into the tens column to be added with the rest of the numbers is the tens place.

Subtraction

The mental math skills we are using have also been preparing our students to subtract using the standard algorithm. When students subtract mentally, they use place value to break apart

numbers in order to reduce their totals. They also use the relationship between addition and subtraction to solve the problems. Once they have those skills in place, they are ready for the standard algorithm. Consider the progression below. Notice how the mental math strategies lead to a better understanding of the procedures associated with the standard subtraction algorithm.

Removal/Counting Back Students will break apart the subtrahend (number being subtracted) into place values and subtract each part from the minuend.	Keeping a Constant Difference With this strategy, students add or subtract the same quantity from both the subtrahend and the minuend, maintaining the difference between the numbers. This allows the students to come up with friendly numbers to subtract.	Adjusting One Number to Create an Easier Problem In this strategy, students choose to adjust only one number. They decide to adjust the number that makes the equation the easiest for them to solve.	Standard Algorithm In the traditional algorithm, students will use decomposition and regrouping to solve problems.
Example: 123 – 59 123 – (10 + 10 + 10 + 10 + 10 + 3 + 6) 123 – 10 = 113 113 – 10 = 103 103 – 10 = 93 93 – 10 = 83 83 – 10 = 73 73 – 3 = 70 70 – 6 = 64 *59 was decomposed into (10 + 10 + 10 + 10 + 3 + 6) to make subtraction easier.	Example: 123 – 59 123 + 1 = 124 59 + 1 = 60 124 - 60 = 64 *123 – 59 is an equivalent expression to 124 – 60 because the distance between each number is the same on the number line (64 spaces).	Example: 123 – 59 59 + 1 = 60 123 – 60 = 63 63 + 1 = 64 *One more number was subtracted than was needed (123- 60, not 123-59). Now, the one extra that we subtracted has to be added back to the total.	Example: $\overset{0}{\cancel{1}}\overset{11}{\cancel{2}}\overset{13}{\cancel{3}}$ $\begin{array}{r} 123 \\ -59 \\ \hline 64 \end{array}$ This is the math happening behind the scene in this method: 123 = 110 + 13 Now, the student can subtract: 13 – 9 = 4 110 – 50 = 60 60 + 4 = 64

Video Support:

Video Support can be found on The WCPSS Academics YouTube Channel.
- http://tinyurl.com/WCPSSAcademicsYouTube
- ES 4 Math Add & Subtract with Show Subtotals Method

Video support can be found on LearnZillion.
- http://learnzillion.com

Solve multi-step word problems by rounding on a number line.
- https://learnzillion.com/student/lessons/1719-solve-multistep-word-problems-by-rounding-on-a-number-line

Solve multi-step word problems using front-end estimation
- https://learnzillion.com/student/lessons/1720-solve-multistep-word-problems-using-frontend-estimation

Understand Place Value: Multiplying by a power of 10
- https://learnzillion.com/lessons/16-understand-place-value-multiplying-by-a-power-of-10

Understand Place Value: Dividing by a power of 10
- https://learnzillion.com/student/lessons/19-understand-place-value-dividing-by-a-power-of-10

Write numbers in expanded form
- https://learnzillion.com/student/lessons/13-write-numbers-in-expanded-form

Write numbers in word form: using place value
- https://learnzillion.com/student/lessons/14-write-numbers-in-word-form-using-place-values

Find place value: using pictures
- https://learnzillion.com/student/lessons/12-find-place-value-using-pictures

Compare numbers: using place value
- https://learnzillion.com/student/lessons/15-compare-numbers-using-place-values

Locate benchmark numbers on a number line
- https://learnzillion.com/student/lessons/523-locate-benchmark-numbers-on-a-number-line

Round numbers to the leading digit using a number line
- https://learnzillion.com/student/lessons/524-round-numbers-to-the-leading-digit-using-a-number-line

Round numbers to a specified place on a number line
- https://learnzillion.com/student/lessons/525-round-numbers-to-a-specified-place-on-a-number-line

Round 9's using base ten blocks
- https://learnzillion.com/student/lessons/526-round-9s-using-base-ten-blocks

Additional Resources:
- NCDPI Additional Resources

Questions to Ask When Helping Your Child with Math Homework

Keep in mind that homework in elementary schools is designed as practice. If your child is having problems, please let the classroom teacher know. When helping your child with his/her math homework, you don't have to know all the answers! Instead, we encourage you to ask probing questions so your child can work through the challenges independently. Some examples may include the following:
- What is the problem you're working on?
- What do the directions say?
- What do you already know that can help you solve the problem?
- What have you done so far and where are you stuck?
- Where can we find help in your notes?
- Are there manipulatives, pictures, or models that would help?
- Can you explain what you did in class today?
- Did your teacher work examples that you could use?
- Can you go onto another problem & come back to this one later?
- Can you mark this problem so you can ask the teacher for an explanation tomorrow?