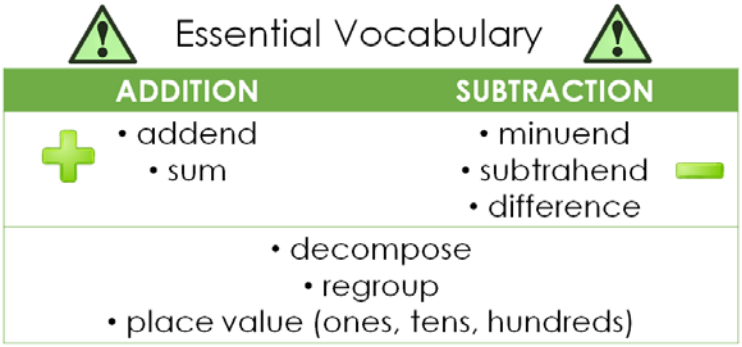
Dear Family,

During this upcoming unit, we will be building on the mental math strategies that we have been using during our classroom number talks. Soon, you will notice that your child will begin using standard algorithms for addition and subtraction.



Let's take a quick look at what students have learned so far:

Kindergarten	First Grade	Second Grade	Third Grade
Students learned the meaning of addition and subtraction. They began solving simple word problems involving addition and subtraction within 10.	Students learned to add and subtract within 20 using strategies such as counting on, making ten, place value, and using a number line. They also began to understand the equal sign as a point of balance in an equation.	Students learned to add and subtract within 100, finding the unknown number in an equation. They solved both one-step and two-step problems. They also became fluent with addition and subtraction (within 20) using mental strategies.	Students solved two-step addition and subtraction problems using equations with a symbol for the unknown number. They learned to use estimation strategies to assess the reasonableness of their answers to addition and subtraction problems up to 1,000. They used place value and the relationship between addition and subtraction to solve problems.

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 +1 117 + 119 236 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

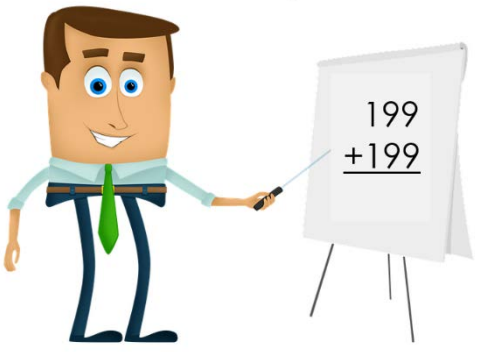
The mental math skills we are using have also been preparing our students to subtract using the standard algorithm. When students subtract mentally, they use place value to break apart numbers in order to reduce their totals. They also use the relationship between addition and subtraction to solve the 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 + 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: 0 11 13 123 -59 64 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

HOW CAN YOU HELP AT HOME?

- Keep an open mind! Your child is gaining a deep understanding of place value that will help them add and subtract in many situations, including places like the grocery store, where pencil and paper are not always handy.
- Encourage your child to talk to you about how they are solving problems. Often, they devise very creative ways to work out answers that are more efficient than the standard algorithm.

Think of this problem:



The standard algorithm asks children to add:

1 1
199
+199
398

9 + 9 = 18 (regroup to add the 10 to the 90 to get 100).

100 + 100 + 100 = 300

100 + 90 = 190 (regroup to add the 100 to the 100 to get 200).

Isn't it easier to use mental math?

199 → 199 + 1 = 200

+199 → 199 + 1 = 200

200 + 200 = 400
400 – 2 = 398

Thank you for serving as partners in your child's success as a mathematician!