KINDERGARTEN ENHANCED MATHEMATICS

UNIT 5

Dear Parents,

We want to make sure that you understand the mathematics your child will be learning this year. Below you will find the standards we will be learning in Unit Five. Each standard is in bold print and underlined and below it is an explanation with student examples. Your child is not learning math the way we did when we were in school, so hopefully this will assist you when you help your child at home. Please let your teacher know if you have any questions.

MGSEK. CC.1 Count to 100 by ones and by tens. ***Rote counting 1- 100 and continue counting by 10's.***
This standard calls for students to rote count by starting at one and counting to 100. When students count by tens, they are only expected to master counting on the decade (0, 10, 20, 30, 40 …). This is a repeating standard that has appeared throughout the year. Mastery of this standard is expected by the end of kindergarten.

MGSEK.OA.1 Represent addition and subtraction with objects, fingers, mental images, drawings, sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations.
This standard asks students to demonstrate the understanding of how objects can be joined (addition) and separated (subtraction) by representing addition and subtraction situations in various ways. This objective is primarily focused on understanding the concept of addition and subtraction, rather than merely reading and solving addition and subtraction number sentences (equations).

MGSEK.OA.2 Solve addition and subtraction word problems, and add and subtract within 10, e.g., by using objects or drawings to represent the problem.
This standard asks students to solve problems presented in a story format (context) with a specific emphasis on using objects or drawings to determine the solution. This objective builds upon their understanding of addition and subtraction from K.OA.1, to solve problems. Once again, numbers should not exceed 10.

Teachers should be cognizant of the three types of problems. There are three types of addition and subtraction problems: Result Unknown, Change Unknown, and Start Unknown. These types of problems become increasingly difficult for students. Research has found that Result Unknown problems are easier than Change and Start Unknown problems. Kindergarten students should have experiences with all three types of problems. The level of difficulty can be decreased by using smaller numbers (up to 5) or increased by using larger numbers (up to 10). Please see Appendix, Table 1 for additional examples.

MGSEK.OA.3 Decompose numbers less than or equal to 10 into pairs in more than one way, e.g., by using objects or drawings, and record each decomposition by a drawing or equation (e.g., 5 = 2 + 3 and 5 = 4 + 1).
This standard asks students to understand that a set of (5) object can be broken into two sets (3 and 2) and still be the same total amount (5). In addition, this objective asks students to realize that a set of objects (5) can be broken in multiple ways (3 and 2; 4 and 1). Thus, when breaking apart a set (decomposing), students develop the understanding that a smaller set of objects exists within that larger set (inclusion). This should be developed in context before moving into how to represent decomposition with symbols (+, -, =).

Example:
"Bobby Bear is missing 5 buttons on his jacket. How many ways can you use blue and red buttons to finish his jacket? Draw a picture of all your ideas. Students could draw pictures of:

- 4 blue and 1 red button
- 3 blue and 2 red buttons
- 2 blue and 3 red buttons
- 1 blue and 4 red buttons

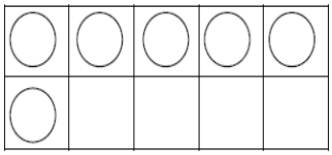
After the students have had numerous experiences with decomposing sets of objects and recording with pictures and numbers, the teacher eventually makes connections between the drawings and symbols: 5=4+1, 5=3+2, 5=2+3, and 5=1+4. The number sentence only comes after pictures or work with manipulatives, and students should never give the number sentence without a mathematical representation.

MGSEK.OA.4 For any number from 1 to 9, find the number that makes 10 when added to the given number, e.g., by using objects or drawings, and record the answer with a drawing or equation.

Once students have had experiences breaking apart ten into various combinations, this asks students to find a missing part of 10.

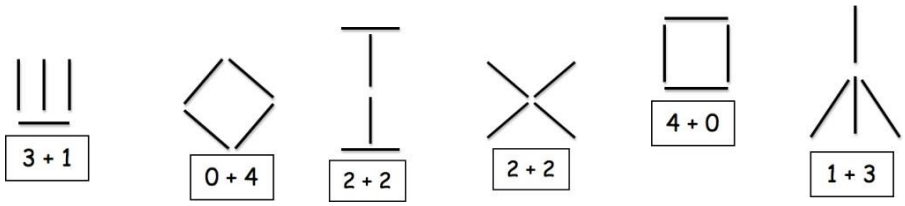
Example:

"A full case of juice boxes has 10 boxes. There are only 6 boxes in this case. How many juice boxes are missing?

Student 1	**Student 2**	**Student 3**
Using a Ten-Frame I used 6 counters for the 6 boxes of juice still in the case. There are 4 blank spaces, so 4 boxes have been removed. This makes sense since 6 and 4 more equals 10. 	*Think Addition* I counted out 10 cubes because I knew there needed to be ten. I pushed these 6 over here because those were already in the container. These are left over. So, there are 4 missing.	*Basic Fact* I know that it is 4 because 6 and 4 is the same amount as 10.

MGSEK.OA.5 Fluently add and subtract within 5.

Students are fluent when they display accuracy (correct answer), efficiency (a reasonable number of steps in about 3 seconds without resorting to counting), and flexibility (using strategies such as the distributive property). Students develop fluency by understanding and internalizing the relationships that exist between and among numbers. Oftentimes, when children think of each "fact" as an individual item that does not relate to any other "fact", they are attempting to memorize separate bits of information that can be easily forgotten. Instead, to fluently add and subtract, children must first be able to see sub-parts within a number. Once they have reached this milestone, children need repeated experiences with many different types of concrete materials (such as cubes, chips, and buttons) over an extended amount of time in order to recognize that there are only particular sub-parts for each number. Therefore, children will realize that if 3 and 2 is a combination of 5, then 3 and 2 cannot be a combination of 6. For example, after making various arrangements with toothpicks, students learn that only a certain number of sub-parts exist within the number 4:



After numerous opportunities to explore, represent and discuss "4", a student becomes able to fluently answer problems such as, "One bird was on the tree. Three more birds came. How many are on the tree now?" and "There was one bird on the tree. Some more came. There are now 4 birds on the tree. How many birds came?" Traditional flash cards or timed tests have not been proven as effective instructional strategies for developing fluency. Rather, numerous experiences with breaking apart actual sets of objects help children internalize parts of number.

MGSEK.MD.3 Classify objects into given categories; count the numbers of objects in each category and sort the categories by count. *(Limit category counts to be less than or equal to 10.)*

This standard asks students to identify similarities and differences between objects (e.g., size, color, shape) and use the identified attributes to sort a collection of objects. Once the objects are sorted, the student counts the amount in each set. Once each set is counted, then the student is asked to sort (or group) each of the sets by the amount in each set.

For example, when given a collection of buttons, the student separates the buttons into different piles based on color (all the blue buttons are in one pile, all the orange buttons are in a different pile, etc.). Then the student counts the number of buttons in each pile: blue (5), green (4), orange (3), and purple (4). Finally, the student organizes the groups by the quantity in each group (Orange buttons (3), Green buttons next (4), Purple buttons with the green buttons because purple also had (4), Blue buttons last (5).

MGSE1.MD.4 Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another. This standard was introduced in Unit 4.

This standard calls for students to work with categorical data by organizing, representing, and interpreting data. Students should have experiences posing a question with 3 possible responses and then work with the data that they collect. For example:

Students pose a question and the 3 possible responses: *Which is your favorite flavor of ice cream? Chocolate, vanilla, or strawberry?* Students collect their data by using tallies or another way of keeping track. Students organize their data by totaling each category in a chart or table. Picture and bar graphs are introduced in 1st Grade.

What is your favorite flavor of ice cream?	
Chocolate	12
Vanilla	5
Strawberry	6

Students interpret the data by comparing categories.
Examples of comparisons:

- What does the data tell us? Does it answer our question?
- More people like chocolate than the other two flavors.
- Only 5 people liked vanilla.
- Six people liked Strawberry.
- 7 more people liked Chocolate than Vanilla.
- The number of people that liked Vanilla was 1 less than the number of people who liked Strawberry.
- The number of people who liked either Vanilla or Strawberry was 1 less than the number of people who liked chocolate.
- 23 people answered this question.

MGSE1.NBT.7 Identify dimes and understand ten pennies can be thought of as a dime. (Use dimes as manipulatives in multiple mathematical contexts.)

This is a repeating standard that appears in units 3, 4, and 5. In unit 3, students focused on identifying a dime. In Unit 4, students began understanding how to unitize and the concept of ten pennies being equivalent to a dime. In Unit 5, students will be asked to decompose various amounts of pennies into a dime and some pennies.