Dear Parents,

The Mathematics Georgia Standards of Excellence (MGSE), present a balanced approach to mathematics that stresses understanding, fluency, and real world application equally. Know that your child is not learning math the way many of us did in school, so hopefully being more informed about this curriculum will assist you when you help your child at home.

Below you will find the standards from Unit Four in bold print and underlined. Following each standard is an explanation with student examples. Please contact your child's teacher if you have any questions.

<u>NBT.1 Count to 120, starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral.</u>

This standard calls for students to rote count forward to 120 by counting on from any number less than 120. This standard also calls for students to read, write and represent a number of objects with a written numeral. Students can represent numbers using cubes, place value (base 10) blocks, pictorial representations, or other concrete materials. As students are developing accurate counting strategies, they are also building an understanding of how the numbers in the counting sequence are related—each number is one more (or one less) than the number before (or after).

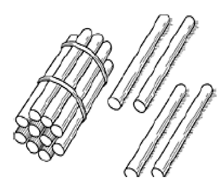
<u>NBT.2 Understand that the two digits of a two-digit number represent amounts of tens and ones. Understand the following as special cases:</u>

<u>a. 10 can be thought of as a bundle of ten ones – called a "ten."</u>

This part of the standard asks students to think of a group of ten ones as a whole unit: a ten. This is the foundation of the place value system. So, rather than seeing a group of ten cubes as ten individual cubes, the student is now asked to see those ten cubes as a bundle – one bundle of ten.

Example:

- This model represents 1 ten and 4 more ones or 14. The student should think "10, 11, 12, 13, 14" instead of 1, 2, 3, 4,…, 14.



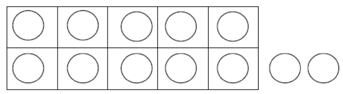
<u>b. The numbers from 11 to 19 are composed of a ten and one, two, three, four, five, six, seven, eight, or nine ones.</u>

This part of the standard asks students to extend their work from kindergarten when they composed and decomposed numbers from 11 to 19 into ten ones and some further ones. In kindergarten, everything was thought of as individual units: —ones. In first grade, students are asked to think of those ten individual ones as a whole unit: —*one* ten. Students in first grade explore the idea that the teen numbers (11 to 19) can be expressed as *one* ten and some leftover ones. Ample experiences with ten frames will help develop this concept.

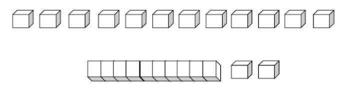
Example:

- For the number 12, do you have enough to make a ten? Would you have any leftover? If so, how many leftovers would you have?

Student 1:
I filled a ten-frame to make one ten and had two counters left over. I had enough to make a ten with some left over. The number 12 has 1 ten and 2 ones.

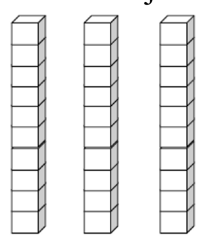


Student 2:
I counted out 12 place value cubes. I had enough to trade 10 cubes for a ten-rod. I now have 1 ten-rod and 2 cubes left over. So the number 12 has 1 ten and 2 ones.



c. The numbers 10, 20, 30, 40, 50, 60, 70, 80, 90 refer to one, two, three, four, five, six, seven, eight, or nine tens (and 0 ones).

This part of the standard builds on the work of NBT.2b. Students should explore the idea that decade numbers (e.g., 10, 20, 30, 40) are groups of tens with no left over ones. Students can represent this with cubes or place value (base 10) rods. It is recommended to make a ten with unfix cubes or other materials that students can group. Provide students with opportunities to count books, cubes, pennies, etc. Counting larger numbers of objects supports grouping to keep track of the number of objects.



NBT.5 Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used.

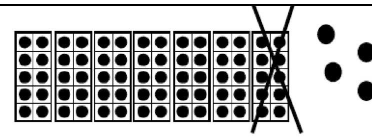
This standard builds on students' work with tens and ones by mentally adding ten more and ten less than any number less than 100. Ample experiences with ten frames and the hundreds chart help students use the patterns found in the tens place to solve such problems.

Example:
There are 74 birds in the park. 10 birds fly away. How many are left?

Student 1
I used a 100s board. I started at 74. Then, because 10 birds flew away, I moved back one row. I landed on 64. So, there are 64 birds left in the park.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Student 2
I pictured 7 ten-frames and 4 left over in my head. Since 10 birds flew away, I took one of the ten-frames away. That left 6 ten-frames and 4 left over. So, there are 64 birds left in the park.



NBT.6 Subtract multiples of 10 in the range 10-90 from multiples of 10 in the range 10-90 (positive or zero differences), using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

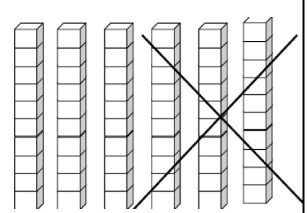
This standard calls for students to use concrete models, drawings and place value strategies to subtract multiples of 10 from decade numbers (e.g., 30, 40, 50).

Example:
There are 60 students in the gym. 30 students leave. How many students are still in the gym?

Student 1
I used a 100s chart and started at 60. I moved up 3 rows to land on 30. There are 30 students left.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Student 2
I used unifix cubes to build towers of 10. I started with 6 towers of 10 and removed 3 towers. I had 3 towers left. 3 towers have a value of 30. So there are 30 students left.



Student 3
Using mental math, I solved this subtraction problem. I know that 30 plus 30 is 60, so 60 minus 30 equals 30. There are 30 students left..

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

This standard asks students to work in a variety of opportunities with dimes and pennies daily. Ideas include (but are not limited to):
• Coin rubbings to help identify pennies and dimes.
• Using the date as a sum of coins by amount and asking what combination of coins could equal today's date. Example: September 14, "What combinations of pennies and dimes could equal 14 cents?"
• Using dimes and pennies as manipulatives.

Fayette County NBT.10 Know the number words to twenty.

This standard expects that students read the number words to twenty and be able to produce models for those number words.

Example:

Write the number for the words below:

- seventeen
- twelve
- zero

OA.3 Apply properties of operations as strategies to add and subtract. Examples: If 8 + 3 = 11 is known, then 3 + 8 = 11 is also known. (Commutative property of addition.) To add 2 + 6 + 4, the second two numbers can be added to make a ten, so 2 + 6 + 4 = 2 + 10 = 12. (Associative property of addition.)

This standard calls for students to apply properties of operations as strategies to add and subtract. Students do not need to use formal terms for these properties. Students should use mathematical tools (cubes and counters) and representations (number line and a 100 chart) to model these ideas.

Example:

Students can build a tower of 8 green cubes and 3 yellow cubes, and then build another tower of 3 yellow cubes and 8 green cubes to show that order does not change the result when adding. Students can also use cubes of 3 different colors to "prove" that (2 + 6) + 4 is equivalent to 2 + (6 + 4) and then to prove 2 + 6 + 4 = 2 + 10.

Commutative Property of Addition	Associative Property of Addition
Order does not matter when you add numbers. For example, if 8 + 2 = 10 is known, then 2 + 8 = 10 is also known.	When adding a string of numbers you can add any two numbers first. For example, when adding 2 + 6 + 4, the second two numbers can be added to make a ten first, so 2 + 6 + 4 = 2 + 10 = 12

OA.5 Relate counting to addition and subtraction (e.g., by counting on 2 to add 2).

This standard asks for students to make a connection between counting and adding and subtracting. Students use various counting strategies, including counting all, counting on, and counting back with numbers up to 20. This standard calls for students to move beyond counting all and become comfortable at counting on and counting back. The counting all strategy requires students to count an entire set. The counting on and counting back strategies occur when students are able to hold the start number in their head and count on from that number.

Example: 5 + 2 = ___

Student 1: *Counting All*	Student 2: *Counting On*
5 + 2 = ___. The student counts five counters. The student adds two more counters. The student then counts 1, 2, 3, 4, 5, 6, 7 to get the answer.	5 + 2 = ___. Student counts five counters. The student adds another counter and says 6, then adds another counter and says 7. The student knows the answer is 7, since they counted on 2.

Example: 12 – 3 = ___

Student 1: *Counting All*	Student 2: *Counting Back*
12 – 3 = ___. The student counts twelve counters. The student removes 3 of the counters. The student counts the remaining counters by ones (1, 2, 3, 4, 5, 6, 7, 8, 9) to get the answer.	12 – 3 = ___. The student counts twelve counters. The student removes a counter and says 11, removes another counter and says 10, and removes a third counter and says 9. The student knows the answer is 9, since they counted back 3.

OA.6 Add and subtract within 20, demonstrating fluency for addition and subtraction within 10. Use strategies such as counting on; making ten (e.g., 8 + 6 = 8 + 2 + 4 = 10 + 4 = 14); decomposing a number leading to a ten (e.g., 13 – 4 = 13 – 3 – 1 = 10 – 1 = 9); using the relationship between addition and subtraction (e.g., knowing that 8 + 4 = 12, one knows 12 – 8 = 4); and creating equivalent but easier or known sums (e.g., adding 6 + 7 by creating the known equivalent 6 + 6 + 1 = 12 + 1 = 13).

This standard mentions the word fluency when students are adding and subtracting numbers within 10. Fluency means accuracy (correct answer), efficiency (within 3-4 seconds), and flexibility (using strategies such as making 5 or making 10). The standard also calls for students to use a variety of strategies when adding and subtracting numbers within 20.
It is important to move beyond the strategy of counting on, as that strategy can become troublesome when working with larger numbers.

Example: 8 + 7 = ___

Student 1: *Making 10 and Decomposing a Number*	Student 2: *Creating an Easier Problem with Known Sums*
I know that 8 plus 2 is 10, so I decomposed (broke) the 7 up into a 2 and a 5. First I added 8 and 2 to get 10, and then added the 5 to get 15. 8 + 7 = (8 + 2) + 5 = 10 + 5 = 15	I know 8 is 7 + 1. I also know that 7 and 7 equal 14 and then I added 1 more to get 15. 8 + 7 = (7 + 7) + 1 = 15

Example: 14 – 6 = ___

Student 1: *Decomposing the Number You Subtract*	Student 2: *Relationship between Addition and Subtraction*
I know that 14 minus 4 is 10, so I broke the 6 up into a 4 and a 2. 14 minus 4 is 10. Then I take away 2 more to get 8. 14 – 6 = (14 – 4) – 2 = 10 – 2 = 8	6 + • is 14. I know that 6 plus 8 is 14, so that means that 14 minus 6 is 8. 6 + 8 = 14, so 14 – 6 = 8

OA.7 Understand the meaning of the equal sign, and determine if equations involving addition and subtraction are true or false. For example, which of the following equations are true and which are false? 6 = 6, 7 = 8 – 1, 5 + 2 = 2 + 5, 4 + 1 = 5 + 2.

This standard calls for students to work with the concept of equality by identifying whether equations are true or false. Therefore, students need to understand that the equal sign does not mean the answer comes next, but rather that the equal sign signifies a relationship between the left and right side of the equation.
The number sentence 4 + 5 = 9 can be read as, four plus five is the same amount as nine. In addition, students should be exposed to various representations of equations, such as: an operation on the left side of the equal sign and a number (sum or difference) on the right side (5 + 8 = 13), an operation on the right side of the equal sign and a number (sum or difference) on the left side (13 = 5 + 8), numbers on both sides of the equal sign (6 = 6), and operations on both sides of the equal sign (5 + 2 = 4 + 3). Students need many opportunities to model equations using cubes, counters, drawings, etc.