1st Grade Unit 8 Mathematics

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 Eight 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.

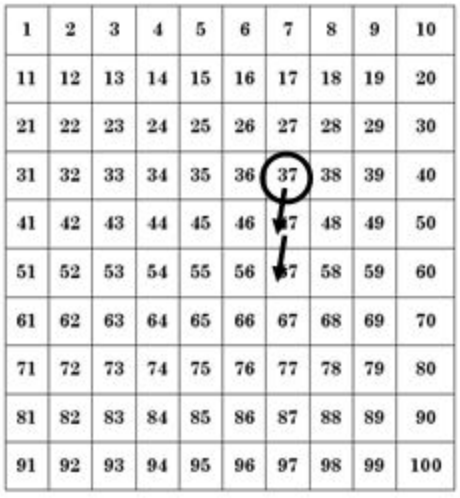
NBT.4 Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten.

This standard calls for students to use concrete models, drawings and place value strategies to add a two-digit number and a one-digit number within 100. Students will also add a two-digit number with a multiple of 10 within 100. Students will not be exposed to the standard algorithm of carrying or borrowing in first grade.

Example:
There are 37 children on the playground. When a class of 20 more students come to the playground, how many students were on the playground altogether?

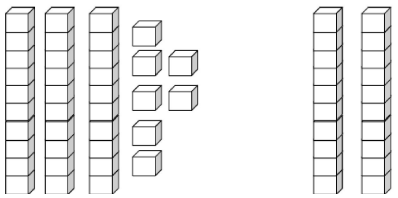
Student 1

I used a hundreds chart. I started at 37 and moved down two rows to add 20 more. I landed on 57, so there are 57 students on the playground.



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 place value blocks and made a pile of 37 and a pile of 20. I joined the tens and got 50. I only had 7 ones. So there are 57 students on the playground.



Student 3
I used mental math because I can count by 10s. I started at 37 and counted on 2 tens to get to 57. So, there are 57 students on the playground.

Fayette County NBT.8 Use concrete representations (e.g., hundreds chart, 99 chart) to explore number patterns and relationships.

This standard asks students to explore patterns on the hundreds chart (or 99 chart). They should look for patterns that involve tens and ones, before/after/between, etc.

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.1 Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.

This standard builds on the ideas students learned in Kindergarten by having students use a variety of mathematical representations (e.g., objects, drawings, and equations) to show their thinking. The unknown symbols could include boxes or pictures but not letters.

There are three types of addition problems:

- Result Unknown
- Change Unknown
- Start Unknown

Examples:

Result Unknown	**Change Unknown**	**Start Unknown**
There are 9 students on the playground. Then 8 more students showed up. How many students are there now? 9 + 8 = ____	There are 9 students on the playground. Some more students show up. There are now 17 students. How many students came? 9 + ____ = 17	There are some students on the playground. Then 8 more students came. There are now 17 students. How many students were on the playground at the beginning? ____ + 8 = 17

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

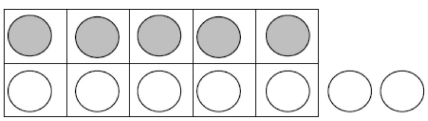
OA.4 Understand subtraction as an unknown-addend problem. *For example, subtract 10 – 8 by finding the number that makes 10 when added to 8. Add and subtract within 20.*

This standard asks for students to use subtraction in the context of unknown addend problems. For example, 12 – 5 = __ could be expressed as 5 + __ = 12. Students should use cubes and counters, and representations such as the number line and the 100 chart, to model and solve problems involving the inverse relationship between addition and subtraction.

Student 1

I used a ten-frame. I started with 5 counters. I knew that I had to have 12, which is one full ten-frame and two left over. I needed 7 counters, so

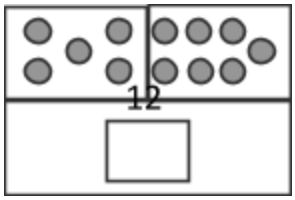
12 – 5 = 7.



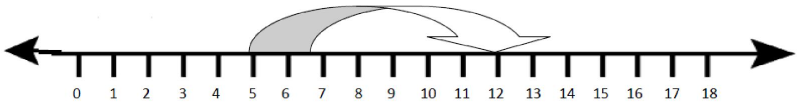
Student 2

I used a part-part-whole diagram. I put 5 counters on one side. I wrote 12 in the "total" section. I added counters to the other side until there were 12 in all. I had to put 7 counters on the other side, so

12 – 5 = 7.



Student 3:
I used a number line. I started at 5 and counted up until I reached 12. I counted 7 numbers, so I know that 12 – 5 = 7.



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*
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.

Student 2: *Counting On*
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*
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.

Student 2: *Counting Back*
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