Clarification of Standards for Parents
Grade 1 Mathematics Unit 4

Dear Parents,
We want to make sure that you have an understanding of the mathematics your child will be learning this year. Below you will find the standards we will be learning in Unit Three. 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. ☺

MGSE1.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 work in Kindergarten by having students use a variety of mathematical representations (e.g., objects, drawings, and equations) during their work. The unknown symbols should include boxes or pictures, and not letters.

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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.

Use informal language (and, minus/subtract, the same as) to describe joining situations (putting together) and separating situations (breaking apart).

Use the addition symbol (+) to represent joining situations, the subtraction symbol (-) to represent separating situations, and the equal sign (=) to represent a relationship regarding quantity between one side of the equation and the other.

A helpful strategy is for students to recognize sets of objects in common patterned arrangements (0-6) to tell how many without counting (subitizing).

Addition Examples:

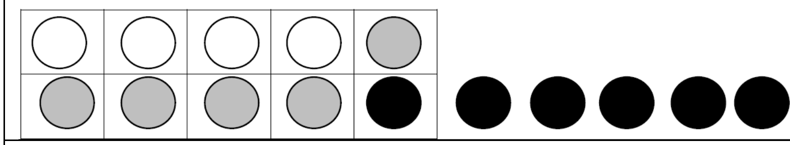
Result Unknown There are 9 students on the playground. Then 8 more students showed up. How many students are there now? *(9 + 8 = ____)*	Change Unknown There are 9 students on the playground. Some more students show up. There are now 17 students. How many students came? *(9 + ____ = 17)*	Start Unknown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

MGSE1.OA.2 Solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.
This standard asks students to add (join) three numbers whose sum is less than or equal to 20, using a variety of mathematical representations.

This objective does address multi-step word problems.

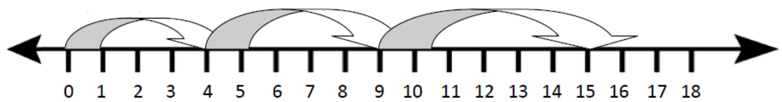
Example:
There are cookies on the plate. There are 4 oatmeal raisin cookies, 5 chocolate chip cookies, and 6 gingerbread cookies. How many cookies are there total?

Student 1: *Adding with a Ten Frame and Counters*
I put 4 counters on the Ten Frame for the oatmeal raisin cookies. Then I put 5 different color counters on the ten-frame for the chocolate chip cookies. Then I put another 6 color counters out for the gingerbread cookies. Only one of the gingerbread cookies fit, so I had 5 leftover. One ten and five leftover makes 15 cookies.



Student 2: *Look for Ways to Make 10*
I know that 4 and 6 equal 10, so the oatmeal raisin and gingerbread equals 10 cookies. Then I add the 5 chocolate chip cookies and get 15 total cookies.

Student 3: *Number Line*
I counted on the number line. First I counted 4, and then I counted 5 more and landed on 9. Then I counted 6 more and landed on 15. So there were 15 total cookies.



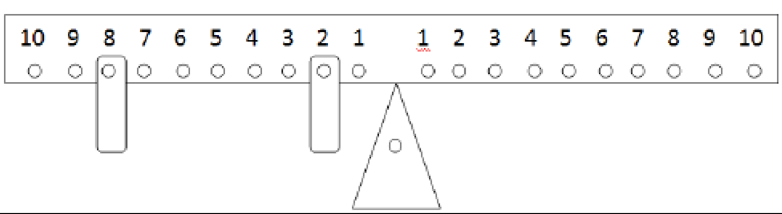
<u>MGSE1.OA.3 Apply properties of operations as strategies to add and subtract. Examples: If 8 + 3 = 11 is known, then 3 + 8 = 11 is also known. (Commutative property of addition.) To add 2 + 6 + 4, the second two numbers can be added to make a ten, so 2 + 6 + 4 = 2 + 10 = 12. (Associative property of addition.)</u>
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, such as cubes and counters, and representations such as the number line and a 100 chart to model these ideas.

Example:
Student can build a tower of 8 green cubes and 3 yellow cubes and another tower of 3 yellow and 8 green cubes to show that order does not change the result in the operation of addition. 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
Order does not matter when you add numbers. For example, if 8 + 2 = 10 is known, then 2 + 8 = 10 is also known.

Associative Property of Addition
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, so 2 + 6 + 4 = 2 + 10 = 12

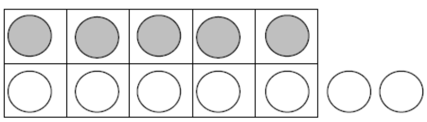
Student Example: *Using a Number Balance to Investigate the Commutative Property*
If I put a weight on 8 *first* and *then* 2, I think that will balance if I put a weight on 2 *first* this time and *then* on 8.



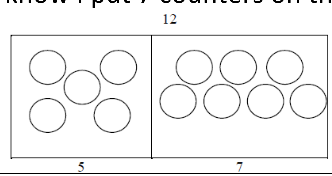
<u>MGSE1.OA.4 Understand subtraction as an unknown-addend problem. *For example, subtract 10 – 8 by finding the number that makes 10 when added to 8. Add and subtract within 20.*</u>

This standard asks for students to use subtraction in the context of unknown addend problems. 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.

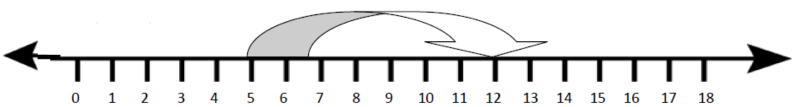
Student 1
I used a ten-frame. I started with 5 counters. I knew that I had to have 12, which is one full ten frame and two leftovers. I needed 7 counters, so 12 – 5 = 7.



Student 2
I used a part-part-whole diagram. I put 5 counters on one side. I wrote 12 above the diagram. I put counters into the other side until there were 12 in all. I know I put 7 counters on the other side, so 12 – 5 = 7.



Student 3: *Draw 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.



<u>MGSE1.OA.5 Relate counting to addition and subtraction (e.g., by counting on 2 to add 2).</u>

This standard asks for students to make a connection between counting and adding and subtraction. 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 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. The student 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 the first 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 them. The student counts 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.

MGSE1.OA.6 Add and subtract within 20.

a. 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).

b. Fluently add and subtract within 10.

It is importance to move beyond the strategy of counting on, which is considered a less important skill than the ones here in 1.OA.6. Many times teachers think that counting on is all a child needs, when it is really not much better skill than counting all and can become troublesome when working with larger numbers.

Example: 8 + 7 = ___

Student 1: *Making 10 and Decomposing a Number* 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	Student 2: *Creating an Easier Problem with Known Sums* 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* 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	Student 2: *Relationship between Addition and Subtraction* 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

Algebraic ideas underlie what students are doing when they create equivalent expressions in order to solve a problem or when they use addition combinations they know to solve more difficult problems. Students begin to consider the relationship between the parts. For example, students notice that the whole remains the same, as one part increases the other part decreases. 5 + 2 = 4 + 3

MGSE1.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 —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 the answer on the right side (5 + 8 = 13) an operation on the right side of the equal sign and the answer on the left side (13 = 5 + 8) numbers on both sides of the equal sign (6 = 6) operations on both sides of the equal sign (5 + 2 = 4 + 3). Students need many opportunities to model equations using cubes, counters, drawings, etc.

<u>MGSE1.OA.8 Determine the unknown whole number in an addition or subtraction equation relating three whole numbers.</u> ***<u>For example, determine the unknown number that makes the equation true in each of the equations 8 + ? = 11, 5 = _ – 3, 6 + 6 = _.</u>***

This standard extends the work that students do in 1.OA.4 by relating addition and subtraction as related operations for situations with an unknown. This standard builds upon the think addition for subtraction problems as explained by Student 2 in MGSE1.OA.6.

Student 1 5 = ___ – 3 I know that 5 plus 3 is 8. So 8 minus 3 is 5.

(Adapted from Henry County Schools)