Fifth Grade Unit 3 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 Three 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>OA.2 Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them</u>

This standard refers to expressions. Expressions are not equations. Expressions are a series of numbers and symbols (+, -, x, ÷) without an equal sign. Equations, however, have an equal sign.

Example:

- 4(5 + 3) is an expression.
- When we compute 4(5 + 3), we are evaluating the expression. The expression's value is 32.
- 4(5 + 3) = 32 is an equation.

This standard calls for students to verbally describe the relationship between expressions without actually calculating them. This standard does not include the use of variables, only numbers and symbols for operations.

Example:

- Write an expression for "double five and then add 26."

Student: *(2 × 5) + 26*

- Describe how the expression 5(10 × 10) relates to 10 × 10.

Student: The value of the expression 5(10 × 10) is 5 times larger than the expression 10 × 10. I know that because 5(10 × 10) means that I have 5 groups of (10 × 10).

<u>NF.1 Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators.</u>

******Primary focus on adding and subtracting with unlike denominators in this unit.******

This standard builds on the work in 4^{th} grade where students add and subtract fractions with like denominators. In 5^{th} grade, students will work with adding and subtracting fractions with unlike denominators. For $^1/_3 + ^1/_6$, a common denominator is 18, which is the product of 3 and 6. Although this is not the least common denominator, 5^{th} graders learn that multiplying the denominators given will always give a common denominator. This process should be introduced using visual fraction models (area models, number lines, etc.) to build understanding before moving into the standard algorithm.

Students should apply their understanding of equivalent fractions and their ability to rewrite fractions in an equivalent form to find the sum or difference with unlike denominators. They should be reminded that

multiplying the denominators will always give a common denominator but may not result in the smallest common denominator.
Example:

$$\frac{2}{5}+\frac{3}{8}=\frac{16}{40}+\frac{15}{40}=\frac{31}{40}$$

NF.2 Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers

******Primary focus on adding and subtracting with unlike denominators in this unit.******

This standard refers to number sense, which means students' understanding of fractions as numbers that lie between whole numbers on a number line. Number sense in fractions also includes moving between decimals and fractions to find equivalents. Students should also be able to use reasoning when comparing fractions (i.e., $^7/_8$ is greater than $^3/_4$ because $^7/_8$ is missing only $^1/_8$ of a whole and $^3/_4$ is missing ¼ of a whole, so $^7/_8$ is closer to a whole and therefore greater). Also, students should use benchmark fractions to estimate and examine the reasonableness of their answers. An example of using a benchmark fraction is illustrated with comparing $^5/_8$ and $^6/_{10}$. Students should recognize that $^5/_8$ is $^1/_8$ larger than $^1/_2$ (since $^1/_2 = {}^4/_8$) and $^6/_{10}$ is $^1/_{10}$ larger than $^1/_2$ (since $^1/_2 = {}^5/_{10}$).
Example:
Your teacher gave you $^1/_7$ of a bag of candy. She also gave your friend $^1/_3$ of the same bag of candy. If you and your friend combined your candy, what fraction of the bag would you have? Estimate your answer and then calculate. How reasonable was your estimate?

Student 1

$^1/_7$ is really close to 0. $^1/_3$ is larger than $^1/_7$ but still less than $^1/_2$. If we put them together we might get close to $^1/_2$.

$$^1/_7 + {}^1/_3 = {}^3/_{21} + {}^7/_{21} = {}^{10}/_{21}$$

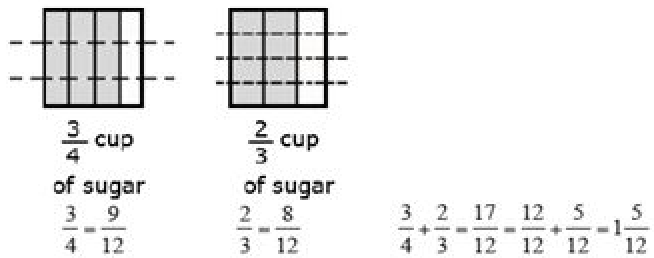
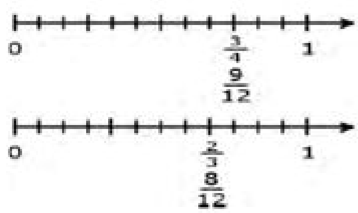
The fraction $^{10}/_{21}$ does not simplify, but I know that 10 is half of 20, so $^{10}/_{21}$ is a little less than $^1/_2$.

Student 2

$^1/_7$ is close to $^1/_6$ but less than $^1/_6$. $^1/_3$ is equivalent to $^2/_6$. So $^1/_7 + {}^1/_3$ is a little less than $^3/_6$ or $^1/_2$.

Example:
Jerry was making two different types of cookies. One recipe needed $^3/_4$ cup of sugar and the other needed $^2/_3$ cup of sugar. How much sugar did he need to make both recipes?

Mental estimation: A student may say that Jerry needs more than 1 cup of sugar but less than 2 cups. An explanation may be to compare both fractions to $^1/_2$ and state that both are larger than $^1/_2$ so the total must be more than 1. In addition, both fractions are slightly less than 1 so the sum cannot be more than 2.

<table>
<tr><td>Area model</td><td>
</td></tr>
<tr><td>Linear model</td><td>
</td></tr>
<tr><td>Solution:</td><td>$\frac{3}{4}+\frac{2}{3}=\frac{8}{12}+\frac{9}{12}=\frac{17}{12}=1\frac{5}{12}$</td></tr>
</table>

Estimation skills include identifying when an estimation is appropriate, determining the level of accuracy needed, selecting the appropriate method of estimation, and verifying solutions or determining the reasonableness of situations using various estimation strategies. Estimation strategies for calculations with fractions extend from students' work with whole number operations and can be supported through the use of physical models.

Example:
Elli drank $^3/_5$ quart of milk and Javier drank $^1/_{10}$ of a quart less than Ellie. How much milk did they drink all together?

Solution:

Elli: $\frac{3}{5}$ Javier: $\frac{3}{5} - \frac{1}{10} = \frac{6}{10} - \frac{1}{10} = \frac{5}{10}$ Total: $\frac{3}{5} + \frac{5}{10} = \frac{6}{10} + \frac{5}{10} = \frac{11}{10}$

This solution is reasonable because Ellie drank more than $^1/_2$ quart and Javier drank $^1/_2$ quart, so together they drank slightly more than one quart.

<u>MD.2 Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Use operations on fractions for this grade to solve problems involving information presented in line plots.</u>
<u>For example, given different measurements of liquid in identical beakers, find the amount of liquid each beaker would contain if the total amount in all the beakers were</u>

******Primary focus on understanding data in fractional values in this unit.******

This standard provides a context for students to work with fractions by measuring objects to one-eighth of a unit. This includes length, mass, and liquid volume. Students are making a line plot of this data and then adding and subtracting fractions based on data in the line plot.

Example:

Students measured objects in their desk to the nearest $^1/_8$ of an inch then displayed data collected on a line plot. How many objects measured $^1/_4$? $^1/_2$? If you put all the objects together end to end what would be the total length of **all** the objects?