
Math Parent Forum

— 3rd, 4th and 5th —
Grades

Goals of Program:

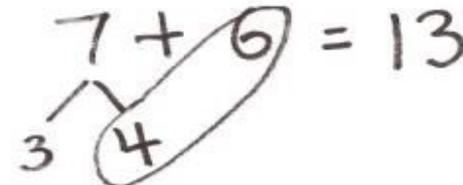
- *Help parents understand math standards and practices
- *Provide parents with knowledge and confidence in understanding their child's thinking
- *Build parents repertoire of strategies to assist with homework and support their child's mathematical progression
- *Answer any additional questions

Changes in Mathematical Instruction: the whats and whys

*Goal is to understand procedures, not memorize them

*Important to start with what a student knows and to build upon that knowledge and understanding

Louie made 7 puppets out of paper bags. Roberto made 6 puppets out of socks. How many puppets did the boys make?

<p>Student A</p>  <p>$7 + 6 = 13$</p>	<p>Student B</p>  <p>$7 + 6 = 13$</p> <p>3 3</p>
<p>Student C</p>  <p>$7 + 6 = 13$</p> <p>3 4</p>	<p>Student D</p>  <p>$7 + 6 = 13$</p>

Haley swam 22 laps each day for 18 days. Then she swam 25 laps each day for 10 days. What was the total number of laps she swam over the 28 days?

Student B

Haley swam about 47 laps over the 28 days. maybe she swam about 550 laps.

$$\begin{array}{r} 22 \\ + 25 \\ \hline 47 \end{array}$$

$$\begin{array}{r} 22 \\ \times 25 \\ \hline 110 \\ 44 \\ \hline 550 \end{array}$$

Student Work Analysis
Haley Swims
Grade Level: 4

Student C

Haley swam 22 laps each day for 18 days. Then she swam 25 laps each day for 10 days. What was the total number of laps she swam over the 28 days?

She swam 646 laps because $(18 \times 22) + (25 \times 10) = 646$ laps

$$\begin{array}{r} 18 \\ \times 22 \\ \hline 36 \\ 360 \\ \hline 396 \\ + 250 \\ \hline 646 \end{array}$$

$$\begin{array}{r} 25 \\ \times 10 \\ \hline 00 \\ 250 \\ \hline 250 \end{array}$$

Student Work Analysis
Problem: Haley Swims
Grade Level: 4

Student D

LAPS

30	2	
200	20	100
160	16	80

396

LAPS

20	5	
200	50	100
120	25	25

250

$$\begin{array}{r} 396 \\ + 250 \\ \hline 500 \\ + 140 \\ \hline 640 \\ + 6 \\ \hline 646 \text{ LAPS} \end{array}$$

Third Grade Standards: new vs. old

2011:

Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction. *(Footnote: A range of algorithms may be used)*

Recognize and generate simple equivalent fractions (e.g., $\frac{1}{2} = \frac{2}{4}$, $\frac{4}{6} = \frac{2}{3}$). Explain why the fractions are equivalent, e.g., by using a visual fraction model.

2004:

Add and subtract (up to four-digit numbers) and multiply (up to two-digit numbers by a one-digit number) accurately and efficiently.

Locate on the number line and compare fractions between 0 and 1 with denominators 2, 3, or 4 (e.g., $\frac{2}{3}$).

Fourth Grade Standards: new vs. old

2011:

Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

Explain why a fraction a/b is equivalent to a fraction $(n \times a)/(n \times b)$ by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions.

2004:

Select, use, and explain various meanings and models of multiplication and division of whole numbers. Understand and use the inverse relationship between the two operations.

Identify and generate equivalent forms of common decimals and fractions less than one whole (halves, quarters, fifths, and tenths).

Fifth Grade Standards: new vs. old

2011:

Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem.

2004:

Accurately and efficiently add and subtract whole numbers and positive decimals. Multiply and divide (using double-digit divisors) whole numbers. Multiply positive decimals with whole numbers.

Represent real situations and mathematical relationships with concrete models, tables, graphs, and rules in words and with symbols, e.g., input-output tables.

3rd Grade Critical Areas:

- 1) Developing understanding of multiplication and division and strategies for multiplication and division within 100
- 2) Developing understanding of fractions, especially unit fractions (fractions with a numerator of 1)
- 3) Developing understanding of the structure of rectangular arrays and of area
- 4) Describing and analyzing two-dimensional shapes

4th Grade Critical Areas

- 1) Developing understanding and fluency with multi-digit multiplication, and developing understanding of dividing to find quotients involving multi-digit dividends.
- 2) Developing an understanding of fraction equivalence, addition and subtraction of fractions with like denominators, and multiplication of fractions by whole numbers.
- 3) Understanding that geometric figures can be analyzed and classified based on their properties, such as having parallel sides, perpendicular sides, particular angle measures, and symmetry.

5th Grade Critical Areas:

- 1) Developing fluency with addition and subtraction of fractions, and developing understanding of the multiplication of fractions and of division of fractions in limited cases
- 2) Extending division to 2-digit divisors, integrating decimal fractions into the place value system and developing understanding of operations with decimals to hundredths, and developing fluency with whole number and decimal operations
- 3) Developing understanding of volume.

Mathematical Tasks

Illustrating word problems to understand the relationships between the quantities involved.

Using the understanding of the problem situation to plan an entry point into a solution.

Using strategies to complete computations.

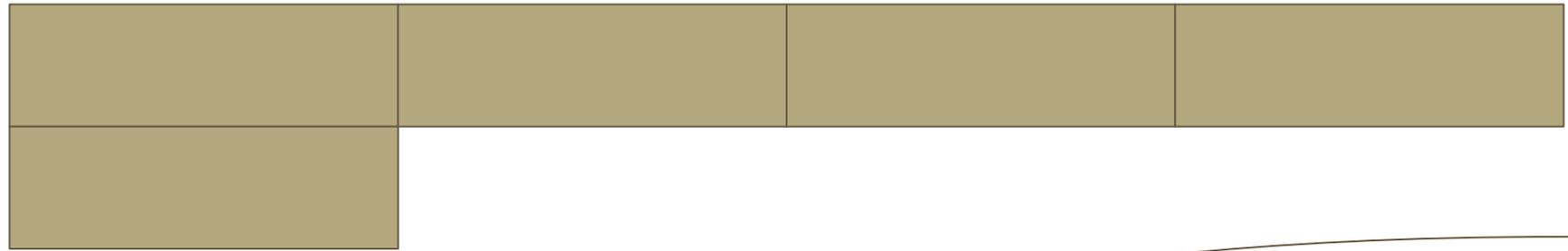
8 Mathematical Practices

1. Make sense of problems and persevere in solving them
2. Reason abstractly and quantitatively
3. Construct viable arguments and critique the reasoning of others
4. Model with mathematics
5. Use appropriate tools strategically
6. Attend to precision
7. Look for and make use of structure
8. Look for and express regularity in repeated reasoning

Math Practice 2 - Thinking abstractly and quantitatively

- *make sense of quantities and their relationships
- *represent problems symbolically
- *consider the units involved
- *knowing and flexibly using different properties

Cindy paid \$3,120 for a MP4 player and a HiFi set. The HiFi set cost 4 times as much as the MP4 Player. What was the cost of the HiFi set?



\$3,120

$$3,120 \div 5 = 624$$

Solve with multiplication? Solve with subtraction?

Math Practice 7: Look for and make sense of structure

- *pattern or structure

- *step back for an overview and shift perspective

- *algebraic expressions, as single objects or as being composed of several objects.

1. $5 \times (n - 6) = 0$ What is n ? (3rd grade)
2. $150 \times 20 - 150 \times 17$ Can you solve a simpler problem? (4th grade)
3. $\frac{1}{3} (A + B + C)$ This answer will be a what? (5th grade)

Math Practice 8: Look for and express regularity in repeated reasoning.

*notice if calculations are repeated, and look both for general methods and for shortcuts

*maintain oversight of the process, while attending to the details

*evaluate the reasonableness

Algorithms:

3rd Grade: A range of algorithms may be used

4th Grade: Fluently add and subtract multi-digit whole numbers using the standard algorithm

5th: Fluently multiply multi-digit whole numbers using the standard algorithm

Students may use these materials to model their math thinking

**Number Lines Bar Models/Tape Diagrams Disc Models
Area Models Arrays Place value charts Line Plots**

These are different ways of adding, subtracting, multiplying or dividing in Math.

**Making a 10 Taking from a 10 Doubling
Starting with a known fact Using inverse operations**

These are common ways of showing your understanding of a math problem or operation with a tape diagram/bar model.

When parts and/or totals are known:



When comparisons are being made:



Online Parent Support

<http://greatminds.net/>

<http://www.hotchalkeducationnetwork.com/parents-guide-to-surviving-common-core-math/>

http://pages.uoregon.edu/dps/CommonCore/CCSSM_bygrade.pdf

<https://www.youtube.com/watch?v=tBkQAxt1JXA>