

Introduction to K – 5 Common Core Math

PTO Meeting

Kindergarten

Emphasis on addition & subtraction to 10, fluency to 5
Base Ten/Place Value

Kindergarten		
Major	Supporting	Additional
<p>Counting and Cardinality</p> <ul style="list-style-type: none"> ■ Know number names and count sequence. ■ Count to tell the number of objects. ■ Compare numbers. <p>Operations and Algebraic Thinking</p> <ul style="list-style-type: none"> ■ Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from. <p>Number and Operations in Base Ten</p> <ul style="list-style-type: none"> ■ Work with numbers 11-19 to gain foundations for place value. 	<p>Geometry</p> <ul style="list-style-type: none"> □ Identify and describe shapes. □ Analyze, compare, create, and compose shapes. 	<p>Measurement and Data</p> <ul style="list-style-type: none"> ○ Describe and compare measurable attributes. ○ Classify objects in categories.

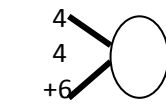
Depth Opportunities:

CC 4, 5, 6; OA 2, 4

First Grade

Emphasis on addition & subtraction to 20, fluency to 10
Decompose numbers, break out or find the 10. Example:

$$\begin{array}{r} 8 \\ + 3 \\ \hline \end{array} \quad \begin{array}{r} 10 \\ + 1 \\ \hline \end{array}$$



Grade 1

Major	Supporting	Additional
<p>Operations and Algebraic Thinking</p> <ul style="list-style-type: none">Represent and solve problems involving addition and subtraction.Understand and apply properties of operations and the relationship between addition and subtraction.Add and subtract within 20.Work with addition and subtraction equations. <p>Number and Operations in Base Ten</p> <ul style="list-style-type: none">Extend the counting sequence.Understand place value.Use place value understanding and properties of operations to add and subtract. <p>Measurement and Data</p> <ul style="list-style-type: none">Measure lengths indirectly and by iterating length units.	<p>Geometry</p> <ul style="list-style-type: none">Reason with shapes and their attributes.	<p>Measurement and Data</p> <ul style="list-style-type: none">Tell and write time.Represent and interpret data.

Depth Opportunities:

OA 1, 6; NBT 2, 4; MD 2

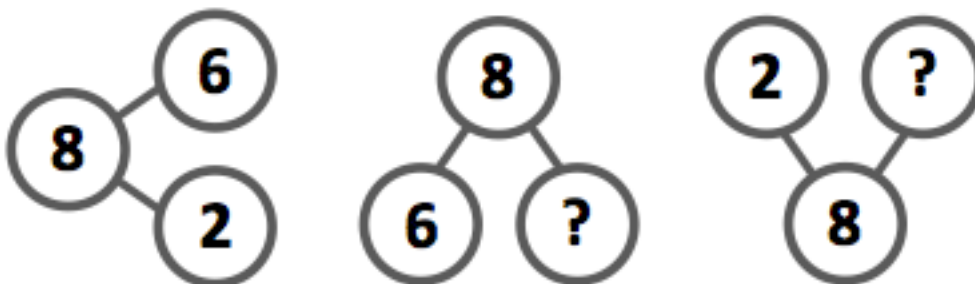
Second Grade

Addition & subtraction fluency to 20

Emphasis on place value

Decomposing and composing numbers

Number bonds – Example:



Grade 2

Major	Supporting	Additional
<p>Operations and Algebraic Thinking</p> <ul style="list-style-type: none"> ■ Represent and solve problems involving addition and subtraction. ■ Add and subtract within 20. ■ Work with equal groups of objects to gain foundations for multiplication. <p>Number and Operations in Base Ten</p> <ul style="list-style-type: none"> ■ Understand place value. ■ Use place value understanding and properties of operations to add and subtract. <p>Measurement and Data</p> <ul style="list-style-type: none"> ■ Measure and estimate lengths in standard units. ■ Relate addition and subtraction to length. 	<p>Geometry</p> <ul style="list-style-type: none"> □ Reason with shapes and their attributes. 	<p>Measurement and Data</p> <ul style="list-style-type: none"> ○ Work with time and money. ○ Represent and interpret data.

Depth Opportunities:

OA 1, 2; NBT 1, 7; MD 5

Third Grade

Emphasis on multiplication & division facts

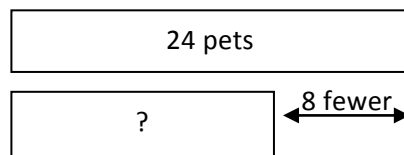
Use of the distributive property in multiplication to solve. E.g. 12×2

Break the 12 into 10 and 2.

Then multiply 10×2 and 2×2 .

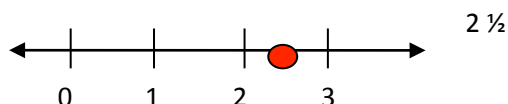
Finally, add the products, $20 + 4 = 24$

Bar model



The pet store had 24 pets on Sunday. They had 8 fewer on Monday. How many did they sell?

Represent a fraction on a number line.



Grade 3

Major	Supporting	Additional
<p>Operations and Algebraic Thinking</p> <ul style="list-style-type: none"> ■ Represent and solve problems involving multiplication and division. ■ Understand the properties of multiplication and the relationship between multiplication and division. ■ Multiply and divide within 100. ■ Solve problems involving the four operations, and identify and explain patterns in arithmetic. <p>Number and Operations – Fractions</p> <ul style="list-style-type: none"> ■ Develop understanding of fractions as numbers. <p>Measurement and Data</p> <ul style="list-style-type: none"> ■ Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects. ■ Geometric measurement: understand concepts of area and relate area to multiplication and to addition. 	<p>Geometry</p> <ul style="list-style-type: none"> □ Reason with shapes and their attributes.¹ <p>Measurement and Data</p> <ul style="list-style-type: none"> □ Represent and interpret data.² 	<p>Number and Operations in Base Ten</p> <ul style="list-style-type: none"> ○ Use place value understanding and properties of operations to perform multi-digit arithmetic. <p>Measurement and Data</p> <ul style="list-style-type: none"> ○ Geometric measurement: recognize perimeter as an attribute of plane figures and distinguish between linear and area measures.

Depth Opportunities:

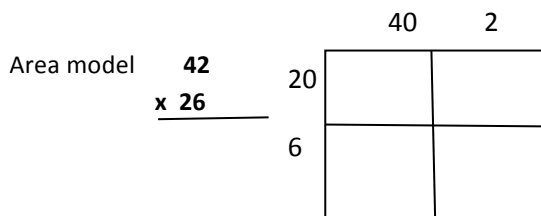
OA 3, 6; NF 3; MD 2, 7

¹ Work should be positioned in support of area measurement and understanding of fractions.

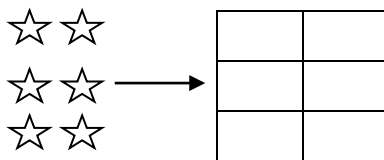
² Students multiply and divide to solve problems using information presented in scaled bar graphs. Pictographs and scaled bar graphs are a visually appealing context for one- and two-step word problems.

Fourth Grade

Emphasis on multiplication and division with multi-digit numbers and use of basic fractions.



Rectangular Array



Division with partial quotient

Step 1	Step 2	Step 3
$\begin{array}{r} 500 \\ 12 \overline{)6324} \\ \underline{6000} \\ 324 \end{array}$	$\begin{array}{r} 20 \\ 500 \\ 12 \overline{)6324} \\ \underline{6000} \\ 324 \\ \underline{240} \\ 84 \end{array}$	$\begin{array}{r} 7 \\ 20 \\ 500 \\ 12 \overline{)6324} \\ \underline{6000} \\ 324 \\ \underline{240} \\ 84 \\ \underline{84} \end{array}$
Conclusion: $6324 \div 12 = 527$		

Grade 4

Major	Supporting	Additional
<p>Operations and Algebraic Thinking</p> <ul style="list-style-type: none"> Use the four operations with whole numbers to solve problems. <p>Number and Operations in Base Ten</p> <ul style="list-style-type: none"> Generalize place value understanding for multi-digit whole numbers. Use place value understanding and properties of operations to perform multi-digit arithmetic. <p>Number and Operations – Fractions</p> <ul style="list-style-type: none"> Extend understanding of fraction equivalence and ordering. Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers. Understand decimal notation for fractions, and compare decimal fractions. 	<p>Operations and Algebraic Thinking</p> <ul style="list-style-type: none"> Gain familiarity with factors and multiples.³ <p>Measurement and Data</p> <ul style="list-style-type: none"> Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit. Represent and interpret data.⁴ 	<p>Operations and Algebraic Thinking</p> <ul style="list-style-type: none"> Generate and analyze patterns. <p>Measurement and Data</p> <ul style="list-style-type: none"> Geometric measurement: understand concepts of angles and measure angles. <p>Geometry</p> <ul style="list-style-type: none"> Draw and identify lines and angles, and classify shapes by properties of their lines and angles.

Depth Opportunities:

NBT 5, 6; NF 1, 3, 4

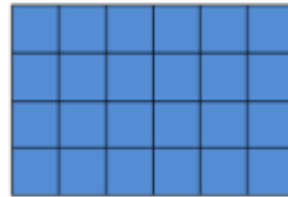
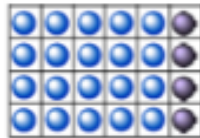
³ Work in this cluster supports students' work with multi-digit arithmetic as well as their work with fraction equivalence.

⁴ The standard in this cluster requires students to use a line plot to display measurements in fractions of a unit and to solve problems involving addition and subtraction of fractions, connecting it directly to the Number and Operations – Fractions clusters.

Fifth Grade

Emphasis on multiplication and division with multi-digit numbers and fractions leading to algebraic understanding.

Area Model or Array for multiplication and division



$$4 \times 6 = \underline{\quad}$$

$$6 \times 4 = \underline{\quad}$$

$$4 \times \underline{\quad} = 24$$

$$\underline{\quad} \times 6 = 24$$

$$24 \div 4 = \underline{\quad}$$

$$24 \div 6 = \underline{\quad}$$

Addition, subtraction, multiplication and division with fractions

Example:

$$\frac{1}{2} \times \frac{2}{5}$$

Step 1. Multiply the top numbers:

$$\frac{1}{2} \times \frac{2}{5} = \frac{1 \times 2}{2 \times 5} = \frac{2}{10}$$

Step 2. Multiply the bottom numbers:

$$\frac{1}{2} \times \frac{2}{5} = \frac{1 \times 2}{2 \times 5} = \frac{2}{10}$$

Step 3. Simplify the fraction:

$$\frac{2}{10} = \frac{1}{5}$$

Grade 5

Major	Supporting	Additional
<p>Number and Operations in Base Ten</p> <ul style="list-style-type: none"> ■ Understand the place value system. ■ Perform operations with multi-digit whole numbers and with decimals to hundredths. <p>Number and Operations – Fractions</p> <ul style="list-style-type: none"> ■ Use equivalent fractions as a strategy to add and subtract fractions. ■ Apply and extend previous understandings of multiplication and division to multiply and divide fractions. <p>Measurement and Data</p> <ul style="list-style-type: none"> ■ Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition. 	<p>Measurement and Data</p> <ul style="list-style-type: none"> □ Represent and interpret data.⁵ □ Convert like measurement units within a given measurement system.⁶ 	<p>Operations and Algebraic Thinking</p> <ul style="list-style-type: none"> ○ Write and interpret numerical expressions. ○ Analyze patterns and relationships. <p>Geometry</p> <ul style="list-style-type: none"> ○ Graph points on the coordinate plane to solve real-world and mathematical problems. ○ Classify two-dimensional figures into categories based on their properties.

Depth Opportunities:

NBT 1, 6; NF 2, 4; MD 5

⁵ The standard in this cluster provides an opportunity for solving real-world problems with operations on fractions, connecting directly to both number and Operations – Fractions clusters.

⁶ Work in these standards supports computation with decimals. For example, converting 5 cm to .05 m involves computation with decimals to hundredths.

Useful Links:

- * Parent and family resources for the Common Core

<http://www.engageny.org/parent-and-family-resources>

- * Solving word problems with tape diagrams:

<http://www.engageny.org/resource/word-problems-with-tape-diagrams>

- * Teaching multiplication with array models and the Rekenrek

<http://www.engageny.org/resource/multiplication-with-arrayarea-models-and-the-rekenrek>

- * Teaching addition and subtraction with tens frames

<http://www.engageny.org/resource/addition-and-subtraction-with-ten-frames>

- * Teaching fractions with number lines and the area model

<http://www.engageny.org/resource/fractions-number-line-and-area-model>

- * Virtual Nerd: Help with Common Core by grade

<http://www.virtualnerd.com/>

- * Learn Zillion: Help with Common Core for parents

<http://learnzillion.com/>

- * Overview video the approach to the Common Core in mathematics

<http://vimeo.com/27066753>