Introduction to K – 5 Common Core Math

PTO Meeting

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

<table>
<thead>
<tr>
<th>Major</th>
<th>Supporting</th>
<th>Additional</th>
</tr>
</thead>
<tbody>
<tr>
<td>Counting and Cardinality</td>
<td>Geometry</td>
<td>Measurement and Data</td>
</tr>
<tr>
<td>▪ Know number names and count sequence.</td>
<td>□ Identify and describe shapes.</td>
<td>□ Describe and compare measurable attributes.</td>
</tr>
<tr>
<td>▪ Count to tell the number of objects.</td>
<td>□ Analyze, compare, create, and compose shapes.</td>
<td>□ Classify objects in categories.</td>
</tr>
<tr>
<td>▪ Compare numbers.</td>
<td>Operations and Algebraic Thinking</td>
<td></td>
</tr>
<tr>
<td>▪ Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from.</td>
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</tr>
<tr>
<td>Number and Operations in Base Ten</td>
<td></td>
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<tr>
<td>▪ Work with numbers 11-19 to gain foundations for place value.</td>
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</tbody>
</table>

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:

\[
\begin{align*}
8 + 3 & \quad 10 + 1 \\
4 + 4 & \quad + 6
\end{align*}
\]
Second Grade

Addition & subtraction fluency to 20

Emphasis on place value

Decomposing and composing numbers

Number bonds – Example:
Third Grade

Emphasis on multiplication & division facts

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

Break the 12 into 10 and 2.
Then multiply 10 X 2 and 2 X 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.
Fourth Grade

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

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<thead>
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</thead>
<tbody>
<tr>
<td>Operations and Algebraic Thinking</td>
<td><strong>Geometry</strong></td>
<td>Number and Operations in Base Ten</td>
</tr>
<tr>
<td>- Represent and solve problems involving multiplication and division.</td>
<td>- Reason with shapes and their attributes.¹</td>
<td>- Use place value understanding and properties of operations to perform multi-digit arithmetic.</td>
</tr>
<tr>
<td>- Understand the properties of multiplication and the relationship between multiplication and division.</td>
<td>- Measurement and Data</td>
<td>- Measurement and Data</td>
</tr>
<tr>
<td>- Multiply and divide within 100.</td>
<td>- Represent and interpret data.⁴</td>
<td>- Geometric measurement: recognize perimeter as an attribute of plane figures and distinguish between linear and area measures.</td>
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<tr>
<td>- Solve problems involving the four operations, and identify and explain patterns in arithmetic.</td>
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</tbody>
</table>

**Number and Operations – Fractions**
- Develop understanding of fractions as numbers.

**Measurement and Data**
- 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.

**Area**

<table>
<thead>
<tr>
<th>Rectangular Array</th>
</tr>
</thead>
<tbody>
<tr>
<td>42 x 26</td>
</tr>
<tr>
<td>20</td>
</tr>
</tbody>
</table>

4 x 26

Area model

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 multiple 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.
Division with partial quotient

<table>
<thead>
<tr>
<th>Step 1</th>
<th>Step 2</th>
<th>Step 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>6324</td>
<td>20</td>
</tr>
<tr>
<td>6000</td>
<td>500</td>
<td></td>
</tr>
<tr>
<td>324</td>
<td>12</td>
<td>6324</td>
</tr>
<tr>
<td></td>
<td>324</td>
<td></td>
</tr>
<tr>
<td></td>
<td>240</td>
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<tr>
<td></td>
<td>84</td>
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</tbody>
</table>

Conclusion: 6324 ÷ 12 = 527

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**Grade 4**

### Major
- **Operations and Algebraic Thinking**
  - Use the four operations with whole numbers to solve problems.
- **Number and Operations in Base Ten**
  - Generalize place value understanding for multi-digit whole numbers.
  - Use place value understanding and properties of operations to perform multi-digit arithmetic.
- **Number and Operations – Fractions**
  - 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.

### Supporting
- **Operations and Algebraic Thinking**
  - Gain familiarity with factors and multiples.  
- **Measurement and Data**
  - Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.
  - Represent and interpret data.  

### Additional
- **Operations and Algebraic Thinking**
  - Generate and analyze patterns.
- **Measurement and Data**
  - Geometric measurement: understand concepts of angles and measure angles.
- **Geometry**
  - 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

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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

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:

\[
\frac{1}{2} \times \frac{2}{5} = \frac{1}{2} \times \frac{2}{5} = \frac{1 \times 2}{2 \times 5} = \frac{2}{10}
\]

Step 3. Simplify the fraction:

\[
\frac{2}{10} = \frac{1}{5}
\]
## Grade 5

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<tbody>
<tr>
<td>Number and Operations in Base Ten</td>
<td></td>
<td>Operations and Algebraic Thinking</td>
</tr>
<tr>
<td>- Understand the place value system.</td>
<td></td>
<td>- Write and interpret numerical expressions.</td>
</tr>
<tr>
<td>- Perform operations with multi-digit whole numbers and with decimals to hundredths.</td>
<td></td>
<td>- Analyze patterns and relationships.</td>
</tr>
<tr>
<td>Number and Operations – Fractions</td>
<td>Measurement and Data</td>
<td>Geometry</td>
</tr>
<tr>
<td>- Use equivalent fractions as a strategy to add and subtract fractions.</td>
<td>- Represent and interpret data. 5</td>
<td>- Graph points on the coordinate plane to solve real-world and mathematical problems.</td>
</tr>
<tr>
<td>- Apply and extend previous understandings of multiplication and division to multiply and divide fractions.</td>
<td>- Convert like measurement units within a given measurement system. 6</td>
<td>- Classify two-dimensional figures into categories based on their properties.</td>
</tr>
<tr>
<td>Measurement and Data</td>
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<tr>
<td>- Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.</td>
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**Depth Opportunities:**
NBT 1, 6; NF 2, 4; MD 5

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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](http://www.engageny.org/parent-and-family-resources)

* Solving word problems with tape diagrams:
  

* Teaching multiplication with array models and the Rekenrek
  

* Teaching addition and subtraction with tens frames
  

* Teaching fractions with number lines and the area model
  

* Virtual Nerd: Help with Common Core by grade
  

* Learn Zillion: Help with Common Core for parents
  

* Overview video the approach to the Common Core in mathematics
  
  [http://vimeo.com/27066753](http://vimeo.com/27066753)