## GRADE 3 OVERVIEW

In Grade 3, instructional time should focus on four 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 numerator 1);

(3) developing understanding of the structure of rectangular arrays and of area; and

(4) describing and analyzing two-dimensional shapes.

### Number and Operations
**Number and Operations in Base Ten**
• Use place value understanding and properties of operations to perform multi-digit arithmetic.

**Number and Operations—Fractions**
• Develop understanding of fractions as numbers.

### Operations and Algebraic Thinking
• Represent and solve problems involving multiplication and division.
• Understand 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.

### Measurement and Data Analysis
• Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects.
• Represent and interpret data.
• Geometric measurement: understand concepts of area and relate area to multiplication and to addition.
• Geometric measurement: recognize perimeter as an attribute of plane figures and distinguish between linear and area measures.

### Geometry
• Reason with shapes and their attributes.

**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.

## CRITICAL AREAS:

**(1) Students develop an understanding of the meanings of multiplication and division of whole numbers** through activities and problems involving equal-sized groups, arrays, and area models; multiplication is finding an unknown product, and division is finding an unknown factor in these situations. For equal-sized group situations, division can require finding the unknown number of groups or the unknown group size. Students use properties of operations to calculate products of whole numbers, using increasingly sophisticated strategies based on these properties to solve multiplication and division problems involving single-digit factors. By comparing a variety of solution strategies, students learn the relationship between multiplication and division.

**(2) Students develop an understanding of fractions, beginning with unit fractions.** Students view fractions in general as being built out of unit fractions, and they use fractions along with visual fraction models to represent parts of a whole. Students understand that the size of a fractional part is relative to the size of the whole. For example, 1/2 of the paint in a small bucket could be less paint than 1/3 of the paint in a larger bucket, but 1/3 of a ribbon is longer than 1/5 of the same ribbon because when the ribbon is divided into 3 equal parts, the parts are longer than when the ribbon is divided into 5 equal parts. Students are able to use fractions to represent numbers equal to, less than, and greater than one. They solve problems that involve comparing fractions by using visual fraction models and strategies based on noticing equal numerators or denominators.

**(3) Students recognize area as an attribute of two-dimensional regions.** They measure the area of a shape by finding the total number of same size units of area required to cover the shape without gaps or overlaps, a square with sides of unit length being the standard unit for measuring area. Students understand that rectangular arrays can be decomposed into identical rows or into identical columns. By decomposing rectangles into rectangular arrays of squares, students connect area to multiplication, and justify using multiplication to determine the area of a rectangle.

**(4) Students describe, analyze, and compare properties of two-dimensional shapes.** They compare and classify shapes by their sides and angles, and connect these with definitions of shapes. Students also relate their fraction work to geometry by expressing the area of part of a shape as a unit fraction of the whole.

## Fluency Expectations for Grade 3

1. Students fluently multiply and divide within 100. By the end of grade 3, they know all products of two one-digit numbers from memory.

2. Students 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.
   *(Although both are both fluency standards, these two standards do not represent equal investments of time in grade 3. Note that students in grade 2 were already adding and subtracting within 1000, just not fluently. That makes #2 a relatively small and incremental expectation. By contrast, multiplication and division are new in grade 3, and meeting the multiplication and division fluency standard #1 with understanding is a major portion of students' work in grade 3.)*