3rd Grade LEUSD Learning Targets in Mathematics

The learning targets below are intended to provide a guide for teachers in determining whether students are exhibiting characteristics of being on pace to meet the standard at the end of the year, as well as for reporting to parents their child's progress towards attainment of the standard. They are not intended to be fully inclusive of what a child is expected to be able to do, but rather serve as a guide for categorizing their progress towards achieving the standards at the end of the year. For a fuller description of each item, please reference the standards, the CA Math Framework and/or the Progressions Documents.

Major Cluster	1st Trimester Learning Targets	2nd Trimester Learning Targets	3rd Trimester Learning Targets
Represent and solve problems involving multiplication and division	Relates equal group situations to arrays Beginning to work towards fluency of the "easier" numbers (e.g. the 2's and 5's) Beginning to understand the meaning and properties of multiplication and division Uses multiplication and division to support each other Students may decompose a product that they do not know in terms of two products they know	Beginning to use diagrams that show the relationships of the numbers more than arrays that show all of the quantities Understands the meaning and properties of multiplication and division, moving beyond additive thinking Describe and reason about the many patterns involved in the Level 2 count-bys and in the Level 3 composing and decomposing methods Begin using a letter for an unknown quantity in expressions or equations for one and two-step problems Beginning to represent and solve two-step problems involving easy and middle difficulty adding and subtracting within 1,000, including use of parentheses	3.OA.1, 3.OA.2, 3.OA.3 AND 3.OA.4

Understand properties of multiplication and the relationship between multiplication and division	Beginning to understand the meaning and properties of multiplication and division Uses multiplication and division to support each other	Beginning to use diagrams that show the relationships of the numbers more than arrays that show all of the quantities Understands the meaning and properties of multiplication and division by comparing a variety of solution strategies Uses area diagrams to support reasoning about the relationship between multiplication and division Using increasingly sophisticated strategies (Level 3 methods) to multiply and divide	3.OA.5 AND 3.OA.6
Multiply and divide within 100	Beginning to understand the meaning and properties of multiplication and division Beginning to work towards fluency of the "easier" numbers (e.g. the 2's and 5's)	Extending fluency from known specific numbers (e.g., 2s, 5s) to all numbers mixed together using various strategies	3.OA.7
Solve problems involving the four operations, and identify and explain patterns in arithmetic	Beginning to explain why patterns in arithmetic make sense mathematically	Beginning to use a letter for the unknown quantity in expressions and equations when solving one and two-step problems Uses estimation during problem-solving and then revisits estimates to check for reasonableness	3.OA.8 AND 3.OA.9
Develop understanding of fractions as numbers	Builds fractions from unit fractions, seeing the numerator 3 of ¾ as saying that ¾ is the quantity you get by putting 3 of the ¼'s together Explains what is meant by "equal parts." Uses an intuitive notion of congruence ("same size and same shape") to explain why the parts are equal Beginning to understand a more precise meaning for "equal parts" as "parts with equal measurements" Uses representations such as area models, tape	Views unit fractions as the basic building blocks of fractions, in the same sense that the number 1 is the basic building block of the whole numbers Sometimes locates the fractions on the number line by marking off the length from **0** , and locate other fractions with the same denominator by marking off the number of lengths indicated by the numerator Beginning to discover that many fractions label the same point on the number line and are therefore equal or equivalent	3.NF.1, 3.NF.2 AND 3.NF.3

	diagrams, and strips of paper to view fractions as numbers	Beginning to see whole numbers as fractions, including the number 1 (4/1 = 4, 3/1 = 3, 4/4 = 1, etc) Compare fractions that have the same denominator or same numerator ***using reasoning*** Beginning to view fractions as points on a number line and developing understanding of order in terms of position on the number line	
Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of object	Developing a basic understanding of the size and weight of a liter, a gram and a kilogram	Represents and solves word problems of time intervals on a number line Writes time to the nearest minute	3.MD.1 AND 3.MD.2
Geometric measurement: understand concepts of area, and relate area to multiplication and addition	Relates equal group situations to arrays Developing an understanding of concepts of area measurement Measures area by counting different sized unit squares	Understands and can explain why the area of a rectangle can be found using multiplication Progressing from viewing multiplication as equal groups, to the total number of objects in an array, to the area of a rectangle a an array of unit squares Beginning to recognize area as additive and decomposes rectilinear figures into non-overlapping rectangles Uses an area model to represent the distributive property in mathematical reasoning Given a perimeter and length or width, uses objects or pictures to find the unknown length or width, justifying solutions with words, diagrams, pictures and numbers	3.MD.5, 3.MD.6 AND 3.MD.7
Reason with shapes and		Describes properties of two-dimensional shapes in more precise ways using properties that are shared rather than the appearances of individual shapes (e.g., start by identifying shapes	

their attributes (not on the Report Card)		with right angles, explain and discuss why the remaining ships do not fit this category, and determine common characteristics of the remaining shapes) Partition shapes into equal parts and name the unit fraction represented in the area of the partitions	

** The NBT progression gives examples of representations that can be used to connect numerals with quantities and to connect numerical representations with combination, composition, and decomposition of base-ten units as students work towards computational fluency.

** The word *fluent* is used in the Standards to mean "fast and accurate. Fluency in each grade involves a mixture of just knowing some answers, knowing some answers from patterns (e.g., "adding 0 yields the same number"), and knowing some answers from the use of strategies. It is important to push sensitively and encouragingly toward fluency of the designated numbers at each grade level, recognizing that fluency will be a mixture of these kinds of thinking which may differ across students.

** Organizing practice so that it focuses most heavily on understood but not yet fluent products and unknown factors can speed learning…As should be clear from the foregoing, this isn't a matter of instilling facts divorced from their meanings, but rather the outcome of a carefully designed learning process that heavily involves the interplay of practice and reasoning.

Grade 3

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.

(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.

Grade 3 Overview

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.

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.

Measurement and Data

- 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.

Operations and Algebraic Thinking 3.OA

Represent and solve problems involving multiplication and division.

1. Interpret products of whole numbers, e.g., interpret 5 × 7 as the total number of objects in 5 groups of 7 objects each. *For example, describe a context in which a total number of objects can be expressed as 5 × 7.*

2. Interpret whole-number quotients of whole numbers, e.g., interpret 56 ÷ 8 as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each. *For example, describe a context in which a number of shares or a number of groups can be expressed as 56÷8.*

3. Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.[1]

4. Determine the unknown whole number in a multiplication or division equation relating three whole numbers. *For example, determine the unknown number that makes the equation true in each of the equations 8 × ? = 48, 5 = ☐ ÷ 3, 6 × 6 = ?.*

Understand properties of multiplication and the relationship between multiplication and division.

5. Apply properties of operations as strategies to multiply and divide.[2] *Examples: If 6 × 4 = 24 is known, then 4 × 6 = 24 is also known. (Commutative property of multiplication.) 3 × 5 × 2 can be found by 3 × 5 = 15, then 15 × 2 = 30, or by 5 × 2 = 10, then 3 × 10 = 30. (Associative property of multiplication.) Knowing that 8 × 5 = 40 and 8 × 2 = 16, one can find 8 × 7 as 8 × (5 + 2) = (8 × 5) + (8 × 2) = 40 + 16 = 56. (Distributive property.)*

6. Understand division as an unknown-factor problem. *For example, find 32 ÷ 8 by finding the number that makes 32 when multiplied by 8.*

Multiply and divide within 100.

7. Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that 8 × 5 = 40, one knows 40 ÷ 5 = 8) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.

Solve problems involving the four operations, and identify and explain patterns in arithmetic.

8. Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.[3]

9. Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. *For example, observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends.*

Number and Operations in Base Ten 3.NBT

Use place value understanding and properties of operations to perform multi-digit arithmetic.[4]

1. Use place value understanding to round whole numbers to the nearest 10 or 100.

1. See Glossary, Table 2.

2. Students need not use formal terms for these properties.

3. This standard is limited to problems posed with whole numbers and having whole-number answers; students should know how to perform operations in the conventional order when there are no parentheses to specify a particular order (Order of Operations).

4. A range of algorithms may be used.

2. 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.
3. Multiply one-digit whole numbers by multiples of 10 in the range 10–90 (e.g., 9 × 80, 5 × 60) using strategies based on place value and properties of operations.

Number and Operations—Fractions[5] 3.NF

Develop understanding of fractions as numbers.

1. Understand a fraction $1/b$ as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction a/b as the quantity formed by a parts of size $1/b$.
2. Understand a fraction as a number on the number line; represent fractions on a number line diagram.
   a. Represent a fraction $1/b$ on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into b equal parts. Recognize that each part has size $1/b$ and that the endpoint of the part based at 0 locates the number $1/b$ on the number line.
   b. Represent a fraction a/b on a number line diagram by marking off a lengths $1/b$ from 0. Recognize that the resulting interval has size a/b and that its endpoint locates the number a/b on the number line.
3. Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size.
   a. Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line.
   b. Recognize and generate simple equivalent fractions, e.g., 1/2 = 2/4, 4/6 = 2/3). Explain why the fractions are equivalent, e.g., by using a visual fraction model.
   c. Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers. *Examples: Express 3 in the form 3 = 3/1; recognize that 6/1 = 6; locate 4/4 and 1 at the same point of a number line diagram.*
   d. Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model.

Measurement and Data 3.MD

Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects.

1. Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.
2. Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l).[6] Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem.[7]

5. Grade 3 expectations in this domain are limited to fractions with denominators 2, 3, 4, 6, and 8.
6. Excludes compound units such as cm^3 and finding the geometric volume of a container.
7. Excludes multiplicative comparison problems (problems involving notions of "times as much"; see Glossary, Table 2).

Represent and interpret data.

3. Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in scaled bar graphs. *For example, draw a bar graph in which each square in the bar graph might represent 5 pets.*

4. Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units—whole numbers, halves, or quarters.

Geometric measurement: understand concepts of area and relate area to multiplication and to addition.

5. Recognize area as an attribute of plane figures and understand concepts of area measurement.
   a. A square with side length 1 unit, called "a unit square," is said to have "one square unit" of area, and can be used to measure area.
   b. A plane figure which can be covered without gaps or overlaps by *n* unit squares is said to have an area of *n* square units.

6. Measure areas by counting unit squares (square cm, square m, square in, square ft, and improvised units).

7. Relate area to the operations of multiplication and addition.
   a. Find the area of a rectangle with whole-number side lengths by tiling it, and show that the area is the same as would be found by multiplying the side lengths.
   b. Multiply side lengths to find areas of rectangles with whole-number side lengths in the context of solving real-world and mathematical problems, and represent whole-number products as rectangular areas in mathematical reasoning.
   c. Use tiling to show in a concrete case that the area of a rectangle with whole-number side lengths a and $b + c$ is the sum of $a \times b$ and $a \times c$. Use area models to represent the distributive property in mathematical reasoning.
   d. Recognize area as additive. Find areas of rectilinear figures by decomposing them into non-overlapping rectangles and adding the areas of the non-overlapping parts, applying this technique to solve real-world problems.

Geometric measurement: recognize perimeter as an attribute of plane figures and distinguish between linear and area measures.

8. Solve real-world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters.

Geometry 3.G

Reason with shapes and their attributes.

1. Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.

2. Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole. *For example, partition a shape into 4 parts with equal area, and describe the area of each part as 1/4 of the area of the shape.*