New Jersey Student Learning Standards for Mathematics and Student Learning Objectives

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Grade 3 – Introductory Multiplication and Division Concepts – Unit 1

Rationale

Unit 1 focuses on an introduction to multiplication and division concepts. Learners build upon their Grade 2 with work with arrays and repeated addition to work with equal groups and larger arrays. They explore this concept of multiplication together with the concept of division. By exploring the concepts together, learners learn to reason about the relationship between the two operations and come to understand division as an unknown-factor problem. Learners use increasingly sophisticated strategies to solve multiplication and division problems involving single digit numbers. As learners apply strategies to solve these problems, they begin working towards accuracy and efficiency (fluency) with these operations. By the end of the unit, learners use drawings and equations with a symbol for the unknown to represent simple two-step word problems using the four operations.

Note: Double asterisks (**) indicate that the example(s) included within the New Jersey Student Learning Standard may be especially informative when considering the Student Learning Objective.

Grade 3 – Unit 1, Module A

Standard	Student Learning Objectives We are learning to … / We are learning that …
■ **3.OA.A.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 and/or represent a context in which a total number of objects can be expressed as 5 × 7.	▪ interpret products of whole numbers in terms of the number of groups and objects**
■ **3.OA.A.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 and/or represent a context in which a number of shares or a number of groups can be expressed as 56 ÷ 8.	▪ interpret whole number quotients of whole numbers as the number of objects in each share (or groups) or as the number of shares (or groups) that result from partitioning a total number of objects**

Key: ■ Major Cluster ▢ Supporting Cluster ○ Additional Cluster

Standard	Student Learning Objectives We are learning to … / We are learning that …
3.OA.A.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.	▪ use multiplication and division within 100 to solve word problems in situations involving: equal groups, arrays and measurement quantities ▪ use drawings and equations with a symbol for the unknown number to represent multiplication and division word problems within 100

Grade 3 – Unit 1, Module B

Standard	Student Learning Objectives We are learning to … / We are learning that …
3.OA.A.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 = ?. **3.OA.B.5** Apply properties of operations as strategies to multiply and divide. *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)* **3.OA.C.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.	▪ determine the unknown whole number in a multiplication or division equation relating three whole numbers ** ▪ apply properties of operations (commutative property) as strategies to multiply ▪ multiply and divide within 100 using strategies such as the relationship between multiplication and division, or properties of operations (working towards accuracy and efficiency)
3.OA.D.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.	▪ identify arithmetic patterns, including patterns in the addition table or multiplication table, and explain them using properties of operations
3.OA.B.6 Understand division as an unknown-factor problem. For example, find 32 ÷ 8 by finding the number that makes 32 when multiplied by 8. **3.OA.C.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 ÷	▪ a related multiplication problem with an unknown factor can be used to solve a division problem ▪ multiply and divide within 100 using strategies such as the relationship between multiplication and division, or properties of operations (working towards accuracy and efficiency)

Standard	Student Learning Objectives We are learning to … / We are learning that …
5 = 8) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.	
3.OA.D.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.NBT.A.1** Use place value understanding to round whole numbers to the nearest 10 or 100.	▪ solve simple two-step word problems using the four operations ▪ represent two-step word problems using equations with a letter standing for the unknown quantity ▪ assess the reasonableness of answers in two-step word problems using mental computation and estimation strategies including rounding ▪ round whole numbers to the nearest 10 or 100, using place value understanding

Grade 3 – Relating Area to Multiplication and Addition – Unit 2

Rationale

This unit focuses on the concepts of area, the distributive property, and multiplication. Learners build upon earlier work with arrays and repeated addition from the prior unit and grade to tile rectangular areas, relating are to multiplication and addition. Learners use area models and properties of operations to reason about and to calculate products of whole numbers, using increasingly sophisticated strategies to solve multiplication word problems involving area. By the end of the unit, learners recognize area as additive and use the concept to determine areas of rectilinear figures. As learners apply strategies to solve multiplication and division problems, they continue working towards accurately and efficiently multiplying and dividing within 100 (fluency).

Grade 3 – Unit 2, Module A

Standard	Student Learning Objectives We are learning to … / We are learning that …
3.MD.C.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.	▪ a square with side length 1 unit, called "a unit square," is said to have 'one square unit of area ▪ a unit square can be used to measure area ▪ area is an attribute of a plane figure ▪ the number of *n* square units covering a plane figure without gaps or overlaps, determines its area
3.MD.C.6 Measure areas by counting unit squares (square cm, square m, square in, square ft, and nonstandard units).	▪ measure area by counting unit squares including square cm, square m, square in, square ft, and nonstandard units

Standard	Student Learning Objectives We are learning to … / We are learning that …
3.MD.C.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.	▪ find the area of a rectangle with whole-number side lengths by tiling it ▪ show that a tiled area is the same as can be found by multiplying the side lengths ▪ multiply side lengths of rectangles to find areas in the context of real world and mathematical problems ▪ represent whole-number products and rectangular areas
3.OA.C.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.	▪ multiply and divide within 100 using strategies such as the relationship between multiplication and division or properties of operations (working towards accuracy and efficiency)
3.MD.C.7 Relate area to the operations of multiplication and addition. 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. **3.OA.B.5** Apply properties of operations as strategies to multiply and divide. *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.)*	▪ use tiling to show the area of a rectangle with whole-number side lengths, a and $b + c$, is composed of two additive areas, $a \times b$ and $a \times c$ ▪ use area models to represent and explain the distribution property by using mathematical reasoning ▪ apply properties of operations (distributive property) as strategies to multiply

Grade 3 – Unit 2, Module B

Standards	Student Learning Objectives We are learning to … / We are learning that …
3.OA.B. 5 Apply properties of operations as strategies to multiply and divide. *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.)* **3.NBT.A.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. **3.OA.C.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.	▪ apply properties of operations (associative property) as strategies to multiply ▪ multiply one-digit whole numbers by multiples of 10 in the range 10 to 90 using strategies based on place value and properties of operations ▪ multiply and divide within 100 using strategies such as: relationship between multiplication and division or properties of operations (working towards accuracy and efficiency)

Grade 3 – Unit 2, Module C

Standard	Student Learning Objectives We are learning to … / We are learning that …
3.MD.C.7 Relate area to the operations of multiplication and addition. 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. **3.NBT.A.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.	▪ recognize area as additive by finding areas of rectangles ▪ recognize area as additive by finding areas of rectilinear figures ** ▪ decompose rectilinear figures into non-overlapping rectangles and find their areas to solve real world problems ▪ add within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction (working towards accuracy and efficiency)
3.NBT.A.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.	▪ subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction (working towards accuracy and efficiency)

Grade 3 – Introductory Fraction Concepts – Unit 3

Rationale

Unit 3 focuses on the foundational fraction concepts. It begins by building upon Grade 2 expectation that learners partition circles and rectangles into two, three, or four equal shares, and describe the shares using the words halves, thirds, or fourths. Learners also build upon their work with area in the previous unit to partition shapes into parts with equal areas. They come to understand unit fractions as quantities formed by partitioning a whole into equal parts. They use visual fraction models to represent simple fractions, to generate simple equivalent fractions, and to compare two fractions by reasoning about their size. Learners also come to understand fractions as numbers by placing them on the number line, and that all fractions are built from unit fractions.

This unit integrates (1) solving word problems involving telling and writing time to the nearest minute; (2) measuring length using rulers and representing the data on line plots; and (3) solving two-step word problems using the four operations; and working towards accurately and efficiently adding and subtracting within 1000.

Grade 3 – Unit 3, Module A

Standard	Student Learning Objectives We are learning to … / We are learning that …
3.NF.A.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*. **3.G.A.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 ¼ of the area of the shape.*	▪ partition shapes into parts with equal areas ▪ express the area of each part as a unit fraction of the whole ▪ a fraction is a quantity formed when a whole is partitioned into equal parts where a unit fraction (*1/b*) is the quantity formed by 1 part when a whole is partitioned into *b* equal parts. (For example, ¼ is the quantity that is formed by 1 part of the 4 total parts when the whole is partitioned into 4 equal parts) ▪ a fraction *a/b* as the quantity formed by *a* parts, where each part has a size of *1/b*. (For example, ¾ is the quantity that is formed by 3 parts of the 4 total parts where each part has a size of ¼.)

Grade 3 – Unit 3, Module B

Standard	Student Learning Objectives We are learning to … / We are learning that …
3.MD.A.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.	▪ 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

Grade 3 – Unit 3, Module C

Standard	Student Learning Objectives We are learning to … / We are learning that …
3.NF.A.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.	▪ fractions are numbers and can be found or represented on the number line ▪ represent and recognize 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 and that the endpoint of the part based at 0 locates the number *1/b* on the number line ▪ represent and recognize a fraction *a/b* on a number line diagram by marking off a lengths *1/b* from 0 and that its endpoint locates the number *a/b* on the number line
3.MD.B.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.	▪ generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch ▪ make a line plot showing measurement data, where the horizontal scale is marked off in appropriate units— whole numbers, halves, or quarters
3.NF.A.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.	▪ compare fractions by reasoning about their size ▪ two fractions are equivalent (equal) if they are the same size, or the same point on a number line ▪ recognize and generate simple equivalent fractions ▪ explain why two fractions are equivalent by using a visual fraction model
3.NF.A.3 Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size. 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.*	▪ express whole numbers as fractions ▪ recognize fractions that are equivalent to whole numbers ▪ compare two fractions with the same numerator or the same denominator by reasoning about their size

Standard	Student Learning Objectives We are learning to … / We are learning that …
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 <.	

Grade 3 – Unit 3, Module D

Standard	Student Learning Objectives We are learning to … / We are learning that …
3.OA.D.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.NBT.A.1** Use place value understanding to round whole numbers to the nearest 10 or 100. **3.NBT.A.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.	▪ solve two-step word problems using the four operations ▪ represent two-step word problems using equations with a letter standing for the unknown quantity ▪ assess the reasonableness of answers in two-step word problems using mental computation and estimation strategies including rounding ▪ round whole numbers to the nearest 10 or 100, using place value understanding ▪ add within 1000 with accuracy and efficiency using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction ▪ subtract within 1000 with accuracy and efficiency using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction

Grade 3 – Spatial Reasoning and Fluency with Operations – Unit 4, Module A

Rationale

This final unit centers on problem solving with geometry and measurement. Learners measure and estimate liquid volumes and masses. They solve one-step word problems involving masses or volumes using the four operations. Building upon previous geometry content from earlier grades, they categorize shapes based on shared attributes. Learners solve real world and mathematical problems involving perimeters of polygons. Learners represent data with scaled graphs, and solve one- and two-step word problems using information presented in scaled graphs. To conclude the year, learners revisit addition and subtraction within 1000, and multiplication and division within 100 to demonstrate accurate and efficient use of strategies (fluency).

Grade 3 – Unit 4, Module A

Standard	Student Learning Objectives We are learning to … / We are learning that …
3.MD.A.2 Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (*l*). 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.	▪ measure liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (*l*) ▪ estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (*l*) ▪ add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units**

Grade 3 – Unit 4, Module B

Standard	Student Learning Objectives We are learning to … / We are learning that …
3.G.A.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.	▪ shapes (quadrilaterals) in different categories may share attributes, and that the shared attributes can define a larger category ** ▪ recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories
3.MD.D.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.	▪ solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths ▪ solve real world and mathematical problems involving perimeters of polygons, including finding unknown side lengths when given the perimeter ▪ solve real world and mathematical problems involving exhibiting rectangles with the same perimeter/different areas or with the same area/different perimeters

Grade 3 – Unit 4, Module C

Standard	Student Learning Objectives We are learning to … / We are learning that …
☐ **3.MD.B.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.*	▪ draw a scaled picture graph to represent a data set with several categories ▪ draw 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

Grade 3 – Unit 4, Module D

Standard	Student Learning Objectives We are learning to … / We are learning that …
3.OA.D.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.NBT.A.1** Use place value understanding to round whole numbers to the nearest 10 or 100. **3.NBT.A.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.	▪ solve two-step word problems using the four operations ▪ represent two-step word problems using equations with a letter standing for the unknown quantity ▪ assess the reasonableness of answers in two-step word problems using mental computation and estimation strategies including rounding ▪ round whole numbers to the nearest 10 or 100, using place value understanding ▪ add within 1000 with accuracy and efficiency by using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction ▪ subtract within 1000 with accuracy and efficiency by using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction
3.OA.C.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.	▪ multiply and divide within 100 using strategies such as: relationship between multiplication and division or properties of operations with accuracy and efficiency ▪ know from memory all products of two one-digit numbers