Grade Three Content Standards Overview

Critical Areas for COHERENCE in Grade Three

Operations and Algebraic Thinking (3.OA)

A. Represents and solves problems involving multiplication and division
   OA.1 OA.2 OA.3 OA.4
B. Understand properties of multiplication and the relationship between multiplication and division
   OA.5 OA.6
C. Multiply and divide within 100
   OA.7
D. Solve problems involving the four operations, and identify and explain patterns in arithmetic.
   OA.8 OA.9

Number and Operations in Base Ten (3.NBT)

A. Use place value understanding and properties of operations to perform multi-digit arithmetic.
   NBT.1 NBT.2 NBT.3

Number and Operations – Fractions (3.NF)

A. Develop understanding of fractions as numbers.
   NF.1 NF.2 NF.3

Measurement and Data (3.MD)

A. Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects.
   MD.1 MD.2 MD.3
B. Represent and interpret data.
   MD.4 MD.5
C. Geometric measurement: understand concepts of area and relate area to multiplication and to addition.
   MD.6 MD.7 MD.8
D. Geometric measurement: recognize perimeter as an attribute of plane figures and distinguish between linear and area measures.
   MD.9

Geometry (3.G)

A. Reason with shapes and their attributes
   G.1 G.2

Standards for 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.

Click on the box to open specific details related to Grade Three!

Operations and Algebraic Thinking 3.OA

(Counting and Cardinality and Operations and Algebraic Thinking Progression K-5 Pg. 22)

Represent and solve problems involving multiplication and division.
(Counting and Cardinality and Operations and Algebraic Thinking Progression K-5 Pg. 22)

3.OA.1. Interpret products of whole numbers*, (e.g. interpret* $5 \cdot 7$ *as the total number of objects in 5 groups of 7 objects each*.) **(3.OA.1)**

3.OA.2. Interpret whole-number quotients of whole numbers, *(e.g. interpret* $56 \div 8$ *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.)* **(3.OA.2)**

3.OA.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.)* Refer to shaded section of Table 2 for specific situation types. **(3.OA.3)**

3.OA.4. Determine the unknown whole number in a multiplication or division equation by using related equations. *For example, determine the unknown number that makes the equation true in each of the equations* $8 \cdot ? = 48$; $5 = \blacksquare \div 3$; $6\ X\ 6 = \_\_$ **(3.OA.4)**

Understand properties *of* multiplication and the relationship between multiplication and division.
(Counting and Cardinality and Operations and Algebraic Thinking Progression K-5 Pg. 24)

3.OA.5. Apply properties of operations as strategies to multiply and divide. *Examples: If* $6 \cdot 4 = 24$ *is known, then* $4 \cdot 6 = 24$ *is also known. (Commutative property of multiplication.)* $3 \cdot 5 \cdot 2$ *can be found by* $3 \cdot 5 = 15$*, then* $15 \cdot 2 = 30$ *, or by* $5 \cdot 2 = 10$ *, then* $3 \cdot 10 = 30$ *. (Associative property of multiplication.) Knowing that* $8 \cdot 5 = 40$ *and* $8 \cdot 2 = 16$ *, one can find* $8 \cdot 7$ *as* $8 \cdot (5 + 2) = (8 \cdot 5) + (8 \cdot 2) = 40 + 16 = 56$*. (Distributive property.) Students need not use formal terms for these properties.* **(3.OA.5)**

3.OA.6. Understand division as an unknown-factor problem. *For example, find* $32 \div 8$ *by finding the number that makes 32 when multiplied by 8.* **(3.OA.6)**

Multiply and divide within 100 (basic facts up to 10 x 10).

3.OA.7. Fluently (efficiently, accurately, and flexibly) multiply and divide with single digit multiplications and related divisions using strategies *(e.g. relationship between multiplication and division, doubles, double and double again, half and then double, etc.)* or properties of operations. **(3.OA.7)**

Solve problems involving the four operations, and identify and explain patterns in arithmetic.
(Counting and Cardinality and Operations and Algebraic Thinking Progression K-5 Pg. 27 Paragraph 2)

3.OA.8. Solve two-step word problems using any of the four operations. Represent these problems using both situation equations and/or solution equations with a letter or symbol standing for the unknown quantity (*refer to Table 1 and Table 2 and standard 3.OA.3*). Assess the reasonableness of answers using mental computation and estimation strategies including rounding. This standard is limited to problems posed with whole numbers and having whole-number answers. **(3.OA.8)**

For Example:
A clown had 20 balloons. He sold some and has 12 left. Each balloon costs $2. How much money did he make?
Situation Equation: $20 - n = 12$
$n \times \$2 = \square$
Solution Equation: $20 - 12 = n$
$n \times \$2 = \square$

3.OA.9. Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations (See Table 5). *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.* **(3.OA.9)**

Number and Operations in Base Ten 3.NBT

(Numbers & Operations Base 10 Progression K-5 Pg. 12)

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

3.NBT.1. Use place value understanding to round whole numbers to the nearest 10 or 100. **(3.NBT.1)**

3.NBT.2. Fluently (efficiently, accurately, & flexibly) add and subtract within 1000 using strategies *(e.g. composing/decomposing by like base-10 units, using friendly or benchmark numbers, using related equations, compensation, number line, etc.)* and algorithms (including, but not limited to: traditional, partial-sums, etc.) based on place value, properties of operations, and/or the relationship between addition and subtraction. **(3.NBT.2)**

3.NBT.3. Multiply one-digit whole numbers by multiples of 10 in the range 10 to 90 *(e.g.* $9 \cdot 80$, $5 \cdot 60$) using strategies based on place value and properties of operations. **(3.NBT.3)**

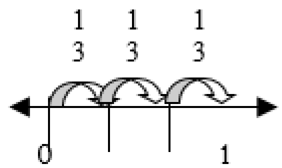
Number and Operations—Fractions 3.NF

Develop understanding of fractions as numbers.
(Grade 3 expectations in this domain are limited to fractions with denominators 2, 3, 4, 6, and 8.)
(Number and Operations – Fractions Progression Pg. 3-5)

3.NF.1. Understand a fraction $\frac{1}{b}$ as the quantity formed by 1 part when a whole is partitioned into *b* equal parts; understand a fraction $\frac{a}{b}$ as the quantity formed by *a* parts of size $\frac{1}{b}$. **(3.NF.1)**

3.NF.2. Understand a fraction as a number on the number line; represent fractions on a number line diagram.

- 3.NF.2a. Represent a fraction $\frac{1}{b}$ 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 $\frac{1}{b}$ and that the endpoint of the part based at 0 locates the number $\frac{1}{b}$ on the number line. **(3.NF.2a)**

  Ex: 

- 3.NF.2b. Represent a fraction $\frac{a}{b}$ on a number line diagram by marking off *a* lengths $\frac{1}{b}$ from 0. Recognize that the resulting interval has size $\frac{a}{b}$ and that its endpoint locates the number $\frac{a}{b}$ on the number line (*a* is the countable units of $\frac{1}{b}$ that determines the place on the number line). **(3.NF.2b)**

3.NF.3. Explain **equivalence** of fractions, and compare fractions by reasoning about their size (it is a mathematical convention that when comparing fractions, the whole is the same size).

- 3.NF.3a. Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line. **(3.NF.3a)**
- 3.NF.3b. Recognize and generate simple equivalent fractions, *(e.g.* $\frac{1}{2} = \frac{2}{4}, \frac{4}{6} = \frac{2}{3}$*.)* Explain why the fractions are equivalent, *e.g. by using a visual fraction model*. **(3.NF.3b)**
- 3.NF.3c. Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers. *Examples: Express 3 in the form* $3 = \frac{3}{1}$*; recognize that* $\frac{6}{1} = 6$*; locate* $\frac{4}{4}$ *and 1 at the same point of a number line diagram.* **(3.NF.3c)**
- 3.NF.3d. 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 relational symbols >, <, =, or ≠, and justify the conclusions, *(e.g. by using a visual fraction model.)* **(3.NF.3d)**

Measurement and Data 3.MD

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

3.MD.1. Tell and write time to the nearest minute using a.m. and p.m. 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.)* (See Table 1) **(3.MD.1)**

3.MD.2. Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l) (Excludes cubed units such as cm^3 and finding the geometric volume of a container). **(3.MD.2)**

3.MD.3. 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.)* (Excludes multiplicative comparison problems) (See Table 1 and Table 2). **(3.MD.2)**

Represent and interpret data.

3.MD.4. 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. (See Table 1). *For example, draw a bar graph in which each square in the bar graph might represent 5 pets.* **(3.MD.3)**
(Measurement and Data (data part) Progression K–5 Pg. 7)

3.MD.5. 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. **(3.MD.4)**
(Measurement and Data (data part) Progression K–5 Pg. 10)

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

3.MD.6. Recognize area as an attribute of plane figures and understand concepts of area measurement.

3.MD.6a. 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 (does not require standard square units). **(3.MD.5a)**

3.MD.6b. 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 (does not require standard square units). **(3.MD.5b)**

3.MD.7. Measure areas by counting unit squares (square cm, square m, square in, square ft, and non-standard square units). **(3.MD.6)**

3.MD.8. Relate area to the operations of multiplication and addition
(Measurement and Data (measurement part) Progression K–5 Pg. 16).

3.MD.8a. 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. **(3.MD.7a)**

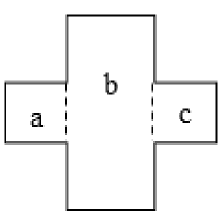
3.MD.8b. Multiply side lengths to find areas of rectangles with whole-number side lengths in the context of solving real world and mathematical problems, and represent whole-number products as rectangular areas in mathematical reasoning. **(3.MD.7b)**

3.MD.8c. 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 $a \cdot b$ and $a \cdot c$. Use area models to represent the distributive property in mathematical reasoning (Supports 3.OA.5). **(3.MD.7c)**

(Measurement and Data (measurement part) Progression K–5 Pg. 18).

3.MD.8d. 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.MD.7d)**

Example:



Students can find the total area of the shape by finding the areas of a, b, and c and adding them together.

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

3.MD.9. 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. **(3.MD.8)** (Measurement and Data (measurement part) Progression K–5 Pg. 16)

Geometry 3.G

Reason with shapes and their attributes.

(Geometry Progression K-6 Pg. 13)

3.G.1. Understand that shapes in different categories *(e.g. rhombuses, rectangles,* **trapezoids***, kites 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. Refer to inclusive definitions noted in the glossary. **(3.G.1)**

3.G.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* $\frac{1}{4}$ *of the area of the shape.* **(3.G.2)**