



Third Grade Mathematics 2019-2020

Operations and Algebraic Thinking

Represent and solve problems involving multiplication and division

1. Interpret products of whole numbers
2. Interpret whole-number quotients of whole numbers
3. Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays and measurement quantities by using drawings and equations with a symbol for the unknown number to represent the problem
4. Determine the unknown whole number in a multiplication or division equation relating three whole numbers

Understand properties of multiplication and the relationship between multiplication and division

- 5a. Apply commutative property of multiplication as a strategy to multiply and divide
- 5b. Apply associative property of multiplication as a strategy to multiply and divide
- 5c. Apply distributive property of multiplication as a strategy to multiply and divide

6. Understand division as an unknown-factor problem

Multiply and divide within 100

- 7a. Fluently multiply within 100, using strategies such as the relationship between multiplication and division or properties of operations
- 7b. Fluently divide within 100, using strategies such as the relationship between multiplication and division or properties of operations

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

- 8a 1. Solve two-step word problems using the four operations
- 8a 2. Select the correct operation when solving word problems
- 8b. Represent these problems using equations with a letter standing for the unknown quantity
- 8c. Assess the reasonableness of answers using mental computation and estimation strategies including rounding
9. Identify arithmetic patterns (*including patterns in the addition table or multiplication table*), and explain them using properties of operations

Numbers and Operations in Base Ten

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

- 1a. Use place value understanding to round whole numbers to the nearest 10
- 1b. Use place value understanding to round whole numbers to the nearest 100
- 2a. Fluently add within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction
- 2b. Fluently 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 using strategies based on place value and properties of operations

Numbers and Operations- Fractions

Develop understanding of fractions as numbers

- 1a. Understand a fraction $\frac{1}{b}$ with the denominators 2, 3, 4, 6, 8 as the quantity formed by 1 part when a whole is partitioned into b equal parts
- 1b. Understand a fraction $\frac{a}{b}$ as the quantity formed by a parts of size $\frac{1}{b}$
- 2. Understand a fraction with the denominators 2, 3, 4, 6, 8 as a number on the number line; represent fractions on a number line diagram**
 - 2a 1. 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
 - 2a 2. 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
 - 2b 1. Represent a fraction $\frac{a}{b}$ on a number line diagram by marking off a lengths $\frac{1}{b}$ from 0
 - 2b 2. Recognize that resulting interval has size $\frac{a}{b}$ and that its endpoint locates the number $\frac{a}{b}$ on the number line

Numbers and Operations- Fractions cont...

3. Explain equivalence of fractions with the denominators of 2, 3, 4, 6, 8 in special cases, and compare fractions by reasoning about their size

3a. Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line

3b 1. Recognize simple equivalent fractions

3b 2. Generate simple equivalent fractions

3b 3. Explain why the fractions are equivalent

3c 1. Express whole numbers as fractions

3c 2. Recognize fractions that are equivalent to whole numbers

3d 1. Compare two fractions with the same numerator or the same denominator by reasoning about their size

3d 2. Recognize that comparisons are valid only when the two fractions refer to the same whole

3d 3. Record the results of comparisons with the symbols $>$, $=$, or $<$, and justify the conclusions

Measurement and Data

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

1. Understand time to the nearest minute

1a 1. Tell and write time to the nearest minute

1a 2. Measure time intervals in minutes, within 60 minutes, on an analog and digital clock

1b 1. Calculate elapsed time greater than 60 minutes to the nearest quarter on a number line diagram

1b 2. Calculate elapsed time greater than 60 minutes to the nearest half hour on a number line diagram

1c. Solve word problems involving addition and subtraction of time intervals in minutes

2a. Measure liquid volumes using standard units of **liters** (l)

2b. Estimate liquid volumes using **liters** (l)

2c. Measure masses of objects using standard units of **grams** (g)

2d. Estimate masses of objects using **grams** (g)

2e. Measure masses of objects using standard units of **kilograms** (kg)

2f. Estimate masses of objects using **kilograms** (kg)

2g. Add, subtract, multiply or divide to solve one-step word problems involving masses or volumes that are given in the same units (*i.e.*, by using drawings, such as a beaker with a measurement scale) to represent the problem

Represent and interpret data

3a. Draw a scaled picture graph to represent data set with several categories

3b. Draw a scaled bar graph to represent a data set with several categories

3c. Solve one and two step "how many more" and "how many less" problems using information presented in scaled bar graphs

4a. Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch

4b. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units— whole numbers, halves, or quarters

5. Recognize area as an attribute of plane figures and understand concepts of area measurement

5a. Understand that 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

5b. Understand a plane figure which can be covered without gaps or overlaps by "n" unit square is said to have an area of "n" square units

6. Measure areas by counting unit squares

6a. square centimeter

6b. square meter

6c. square inch

6d. square foot

6e. Improvised units

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

7. Relate area to the operations of multiplication and addition

7a. 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 side lengths

Measurement and Data cont...

7b. Multiply side lengths to find areas of rectangles with whole-number side lengths in context of solving real world & mathematical problems represent whole-number products as rectangular areas in math reasoning

7c. 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

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

8a. Find perimeter given side lengths

8b. Find an unknown side length

8c. Exhibit rectangles with the same perimeter and different areas or with the same area and different perimeters

9. Solve word problems involving pennies, nickels, dimes and bills greater than one dollar; using dollars and cents appropriately

Geometry

Reason with shapes and their attributes

1a. 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*)

1b. Recognize rhombuses, rectangles, and squares as examples of quadrilaterals

1c. Draw examples of quadrilaterals that do not belong to the subcategories of rhombuses, rectangles, and squares

2a. Partition shapes into parts with equal areas

2b. Express the area of each part as a unit fraction of the whole (*e.g., Partition shape into 4 parts w/ equal area & describe the area of each part as 1/4 of the area of the shape.*)