



3.OA Operations and Algebraic Thinking

3.OA.A Represent and solve problems involving multiplication and division.

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.

- E.1 Count equal groups
- E.2 Identify multiplication expressions for equal groups
- E.3 Write multiplication sentences for equal groups
- E.4 Relate addition and multiplication for equal groups
- E.5 Identify multiplication expressions for arrays
- E.6 Write multiplication sentences for arrays
- E.7 Make arrays to model multiplication
- E.8 Write multiplication sentences for number lines
- N.9 Relate addition and multiplication

3.OA.A.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.

- I.1 Divide by counting equal groups
- I.2 Write division sentences for groups
- I.4 Write division sentences for arrays

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.

- H.6 Multiplication word problems
- H.7 Multiplication word problems: find the missing factor

L.5 Division word problems

3.OA.A.4 Determine the unknown whole number in a multiplication or division equation relating three whole numbers.

G.4 Multiplication facts for 2, 3, 4, 5, and 10: find the missing factor

G.8 Multiplication facts for 6, 7, 8, and 9: find the missing factor

G.12 Multiplication facts up to 10: find the missing factor

K.10 Division facts up to 10: find the missing number

3.OA.B Understand properties of multiplication and the relationship between multiplication and division.

3.OA.B.5 Apply properties of operations as strategies to multiply and divide.

N.5 Properties of multiplication

N.6 Distributive property: find the missing factor

N.7 Multiply using the distributive property

N.8 Solve using properties of multiplication

3.OA.B.6 Understand division as an unknown-factor problem.

I.3 Relate multiplication and division for groups

I.5 Relate multiplication and division for arrays

3.OA.C Multiply and divide within 100.

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

F.1 Multiply by 0

F.2 Multiply by 1

F.3 Multiply by 2

- F.4 Multiply by 3
- F.5 Multiply by 4
- F.6 Multiply by 5
- F.7 Multiply by 6
- F.8 Multiply by 7
- F.9 Multiply by 8
- F.10 Multiply by 9
- F.11 Multiply by 10
- G.1 Multiplication tables for 2, 3, 4, 5, and 10
- G.2 Multiplication facts for 2, 3, 4, 5, and 10: true or false?
- G.3 Multiplication facts for 2, 3, 4, 5, and 10: sorting
- G.5 Multiplication tables for 6, 7, 8, and 9
- G.6 Multiplication facts for 6, 7, 8, and 9: true or false?
- G.7 Multiplication facts for 6, 7, 8, and 9: sorting
- G.9 Multiplication tables up to 10
- G.10 Multiplication facts up to 10: true or false?
- G.11 Multiplication facts up to 10: sorting
- G.13 Multiplication facts up to 10: select the missing factors
- G.14 Multiplication sentences up to 10: true or false?
- G.20 Squares up to 10 x 10
- H.4 Multiplication input/output tables
- J.1 Divide by 1
- J.2 Divide by 2
- J.3 Divide by 3
- J.4 Divide by 4
- J.5 Divide by 5
- J.6 Divide by 6
- J.7 Divide by 7
- J.8 Divide by 8
- J.9 Divide by 9

- J.10 Divide by 10
- K.1 Division facts for 2, 3, 4, 5, and 10
- K.2 Division facts for 2, 3, 4, 5, and 10: true or false?
- K.3 Division facts for 2, 3, 4, 5, and 10: sorting
- K.4 Division facts for 6, 7, 8, and 9
- K.5 Division facts for 6, 7, 8, and 9: true or false?
- K.6 Division facts for 6, 7, 8, and 9: sorting
- K.7 Division facts up to 10
- K.8 Division facts up to 10: true or false?
- K.9 Division facts up to 10: sorting
- K.11 Division facts up to 10: select the missing numbers
- K.12 Division sentences up to 10: true or false?
- L.3 Division input/output tables
- M.3 Multiplication and division facts up to 5: true or false?
- M.4 Multiplication and division facts up to 10: true or false?
- N.8 Solve using properties of multiplication

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

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.

- M.1 Addition, subtraction, multiplication, and division facts
- M.2 Complete the addition, subtraction, multiplication, or division sentence
- M.7 Add, subtract, multiply, and divide
- M.9 Addition, subtraction, multiplication, and division word problems
- M.11 Perform multiple operations with whole numbers
- M.12 Multi-step word problems
- O.2 Solve for the variable: addition and subtraction
- O.4 Solve for the variable: addition, subtraction, multiplication, and division

- O.5** Write variable equations to represent word problems
- P.1** Rounding - nearest ten or hundred only
- P.2** Rounding
- P.11** Solve inequalities using estimation

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

- C.8** Addition patterns over increasing place values
- D.6** Subtraction patterns over increasing place values
- H.5** Multiplication input/output tables: find the rule
- L.4** Division input/output tables: find the rule

3.NBT Number and Operations in Base Ten

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

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

- P.1** Rounding - nearest ten or hundred only

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.

- C.1** Add two numbers up to three digits
- C.2** Addition input/output tables - up to three digits
- C.6** Add three numbers up to three digits each
- C.7** Add three numbers up to three digits each: word problems
- D.1** Subtract numbers up to three digits
- D.2** Subtraction input/output tables - up to three digits
- D.3** Subtract numbers up to three digits - word problems

- D.4** Complete the subtraction sentence - up to three digits
- D.5** Balance subtraction equations - up to three digits
- N.3** Properties of addition
- N.4** Solve using properties of addition

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.

- F.11** Multiply by 10
- H.1** Multiply by a multiple of ten

3.NF Number and Operations—Fractions

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

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 $1/b$.

- W.2** Understand fractions: fraction bars
- W.3** Understand fractions: area models
- W.4** Show fractions: fraction bars
- W.5** Show fractions: area models
- W.6** Match fractions to models: halves, thirds, and fourths
- W.7** Match unit fractions to models
- W.8** Match fractions to models
- W.16** Unit fractions: modeling word problems
- W.17** Unit fractions: word problems
- W.18** Fractions of a whole: modeling word problems
- W.19** Fractions of a whole: word problems

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

3.NF.A.2a 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.

- W.9** Fractions of number lines: unit fractions
- W.11** Identify unit fractions on number lines
- W.13** Graph unit fractions on number lines

3.NF.A.2b 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.

- W.10** Fractions of number lines
- W.12** Identify fractions on number lines
- W.14** Graph fractions on number lines

3.NF.A.3 Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size.

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

- X.2** Identify equivalent fractions on number lines
- X.3** Find equivalent fractions using number lines

3.NF.A.3b 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.

- X.1** Find equivalent fractions using area models
- X.4** Graph equivalent fractions on number lines
- X.5** Select equivalent fractions
- X.6** Find equivalent fractions
- X.10** Find equivalent fractions with denominators of 10 and 100
- X.11** Write fractions in lowest terms

3.NF.A.3c Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers.

- X.7** Graph fractions equivalent to 1 on number lines
- X.8** Select fractions equivalent to whole numbers using area models
- X.9** Find fractions equivalent to whole numbers

3.NF.A.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 symbols $>$, $=$, or $<$, and justify the conclusions, e.g., by using a visual fraction model.

- W.15** Graph smaller or larger fractions on a number line
- Y.1** Compare fractions using models
- Y.2** Compare fractions using number lines
- Y.3** Graph and compare fractions with like denominators on number lines
- Y.4** Graph and compare fractions with like numerators on number lines
- Y.5** Graph and compare fractions on number lines
- Y.6** Compare fractions
- Y.7** Compare fractions in recipes

3.MD Measurement and Data

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

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.

- T.1** Match clocks and times
- T.2** Match analog and digital clocks
- T.3** Read clocks and write times
- T.4** A.M. or P.M.

T.5 Write times

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.

BB.14 Which metric unit of weight is appropriate?

3.MD.B Represent and interpret data.

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.

U.6 Use bar graphs to solve problems

U.7 Create bar graphs

U.12 Create pictographs

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.

U.10 Create line plots with fractions

BB.3 Measure using an inch ruler

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

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

3.MD.C.5a 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.

FF.6 Find the area of figures made of unit squares

FF.7 Select figures with a given area

FF.8 Select two figures with the same area

FF.12 Find the area of rectangles with missing unit squares

3.MD.C.5b 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.

FF.9 Create figures with a given area

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

FF.6 Find the area of figures made of unit squares

FF.7 Select figures with a given area

FF.8 Select two figures with the same area

FF.12 Find the area of rectangles with missing unit squares

3.MD.C.7 Relate area to the operations of multiplication and addition.

3.MD.C.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 the side lengths.

FF.9 Create figures with a given area

3.MD.C.7b 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.

E.7 Make arrays to model multiplication

FF.10 Find the area of rectangles and squares

FF.13 Find the area of rectangles: word problems

3.MD.C.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.

3.MD.C.7d 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.

FF.14 Find the area of complex figures

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

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.

FF.1 Perimeter of rectangles

FF.2 Perimeter of rectilinear shapes

FF.3 Perimeter of polygons

FF.4 Perimeter: find the missing side length

FF.5 Perimeter: word problems

FF.18 Relationship between area and perimeter I

FF.19 Relationship between area and perimeter II

3.G Geometry

3.G.A Reason with shapes and their attributes.

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.

DD.3 Parallel sides in quadrilaterals

DD.4 Identify parallelograms

DD.5 Identify trapezoids

DD.6 Identify rectangles

DD.7 Identify rhombuses

DD.8 Classify quadrilaterals

3.G.A.2 Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole.

W.1 Identify equal parts

W.7 Match unit fractions to models