Maryland Mathematics

Grade 3

Number and Operation Sense NOS

A UNDERSTAND PLACE VALUE. 3.NOS.A

1 Apply and extend place value understanding to whole numbers within 10,000. 3.NOS.A.1

- a Read and write whole numbers using base-ten numerals, number names, and expanded form. 3.NOS.A.1.A
- b Compose and decompose whole numbers. 3.NOS.A.1.B
- c Estimate quantities by reasoning about their location on a number line, their relationship to benchmark numbers, and rounding to nearest 10 or 100. 3.NOS.A.1.C
- d Compare two whole numbers by reasoning about the values of the digits and the location of the numbers on a number line. Record the results of comparisons with the symbols , =, and . 3.NOS.A.1.D

B REPRESENT AND INTERPRET PROBLEMS INVOLVING MULTIPLICATION AND DIVISION. 3.NOS.B

2 Represent and interpret multiplication of two factors (0- 10) as equal groups or as a composed unit that can be repeated/iterated. Explain the relationship between the factors and products. 3.NOS.B.2

3 Represent and interpret whole-number quotients (0-10) as dividing an amount into known number of groups (partitive) or as dividing an amount into groups of known size (quotative). Explain the relationship between the quotient, divisor, and dividend. 3.NOS.B.3

C UNDERSTAND PROPERTIES OF MULTIPLICATION AND THE RELATIONSHIP BETWEEN MULTIPLICATION DIVISION. 3.NOS.C

4 Identify and apply the Commutative Property of Multiplication, Associative Property of Multiplication, and Distributive Property of Multiplication as strategies to multiply. 3.NOS.C.4

5 Explain and use the inverse relationship between multiplication and division to determine the unknown whole number in a multiplication or division equation involving three whole numbers (e.g., find 32 ÷ 8 by thinking of unknown-factor problem and finding the number that equals 32 when multiplied by 8). 3.NOS.C.5

D USE PLACE VALUE UNDERSTANDING AND PROPERTIES OF OPERATIONS TO PERFORM MULTI-DIGIT ARITHMETIC. 3.NOS.D

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6 Estimate sums and differences within 1,000 using benchmark numbers and front-end estimation. Determine when an estimate is appropriate and when an exact answer is needed. 3.NOS.D.6

7 Fluently add and subtract within 1,000. 3.NOS.D.7

a Use computational strategies efficiently (e.g., decomposition, partials sums, compensation, make ten/hundred/thousand) to add and subtract. 3.NOS.D.7.A

b Use properties of operations, and/or the inverse relationship between addition and subtraction. 3.NOS.D.7.B

c Determine and explain when a strategy is most efficient. 3.NOS.D.7.C

8 Multiply one-digit whole numbers by multiples of 10 in the range of 10-90 (e.g., 9 × 80;60 × 5) using strategies based on place value and properties of operations. 3.NOS.D.8

E MULTIPLY AND DIVIDE WITHIN 100. 3.NOS.E

9 Recall or quickly derive multiplication and division facts within 100 (e.g., factors less than or equal to 10 and quotients less than or equal to 10). 3.NOS.E.9

a Skip count (2s, 5s, 10s) and apply properties of operations (0s, 1s) to derive foundational facts. 3.NOS.E.9.A

b Derive unknown facts from known facts using double facts (e.g., to solve 4 × 3, double 3 to get 6 and double 6 to get 12) to multiply and divide. 3.NOS.E.9.B

c Use properties of operations (e.g., to solve 8 × 7, think of (5 × 7) + (3 × 7)) to multiply. 3.NOS.E.9.C

d Use the inverse relationship between multiplication and division (e.g., think of to solve) to multiply and divide. 3.NOS.E.9.D

F DEVELOP UNDERSTANDING OF FRACTIONS AS NUMBERS. 3.NOS.F

10 Recognize and explain that a fraction represents a part of a whole. 3.NOS.F.10

a Partition shapes into parts with equal areas and express the area of each part using a unit fraction. 3.NOS.F.10.A

b Explain that a fraction represents one part of a whole that is divided into d equal parts, and that a fraction represents c parts of size . 3.NOS.F.10.B

11 Explain a fraction of a set as the quantity formed by c items as part of the given set of d objects. 3.NOS.F.11

12 Represent a fraction as a number on the number line. 3.NOS.F.12

a Represent a fraction on a number line by defining the interval from 0 to 1 as the whole and partitioning it into d equal lengths. Recognize that each length measures and that the endpoints of the length starting at 0 represents the number on the number line. 3.NOS.F.12.A

b Represent a fraction on a number line by marking off c lengths of from 0. Recognize that the resulting interval has size and that the endpoint of the length locates the number on the number line. 3.NOS.F.12.B

Skip to main content

13 Explain equivalence of fractions and compare fractions by reasoning about their size, recognizing that comparisons are valid only when the two fractions refer to the same whole. 3.NOS.F.13

a Represent two fractions as equivalent if they are the same size, or they represent the same point on the number line. 3.NOS.F.13.A

b Identify and generate equivalent fractions, (e.g., , .) and explain why the fractions are equivalent using concrete materials, drawings, number lines, or equations. 3.NOS.F.13.B

c Express whole numbers as fractions, and identify fractions that are equivalent to whole numbers, (e.g., express 3 in the form ; recognize that ; locate and 1 at the same point on a number line). 3.NOS.F.13.C

d Compare two fractions with the same numerator or the same denominator by reasoning about their size. Record the results of comparisons with the symbols , =, or , and justify the conclusions (e.g., by using concrete materials, drawings, number lines, and/or equations). 3.NOS.F.13.D

Algebraic Thinking AT

A SOLVE PROBLEMS INVOLVING THE FOUR OPERATIONS AND IDENTIFY AND EXPLAIN PATTERNS IN ARITHMETIC. 3.AT.A

1 Use multiplication and division within 100 to solve onestep problems in context involving equal groups, arrays, and area by using concrete materials, drawings, and/or equations. 3.AT.A.1

2 Use the four operations to solve two-step problems in context (within number limits for each operation as stated in 3.NOS.B and 3.NOS.D). 3.AT.A.2

a Represent these problems using equations with a letter standing for the unknown quantity. 3.AT.A.2.A

b Assess the reasonableness of answers in terms of context, using mental computation and estimation strategies including, rounding, frontend estimation, and benchmark numbers. 3.AT.A.2.B

3 Identify arithmetic patterns and explain them using properties of operations (e.g., observe the pattern that 4 times a number is always even and explain why 4 times a number can be decomposed into two equal addends). 3.AT.A.3

Skip to main content

Geometric Reasoning and Measurement GR

A SOLVE PROBLEMS INVOLVING MEASUREMENT AND ESTIMATION OF INTERVALS OF TIME, LIQUID, AND MASSES OF OBJECTS. 3.GR.A

1. Measure the length of an object to the nearest half and quarter unit by using appropriate tools (e.g., rulers, yardsticks, meter sticks, and measuring tapes). 3.GR.A.1
2. Solve problems in context that involve addition and subtraction of time intervals in minutes (e.g., represent and solve using a number line). 3.GR.A.2
3. Measure and estimate liquid volumes and masses of objects using standard units of liters(l), grams (g), and kilograms (kg). 3.GR.A.3
4. Add, subtract, multiply, or divide to solve one-step problems in measurement contexts involving masses or volumes that are given in the same units. 3.GR.A.4

B REASON WITH SHAPES AND THEIR ATTRIBUTES. 3.GR.B

5. Explain 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 of shapes (e.g., quadrilaterals). 3.GR.B.5

C UNDERSTAND CONCEPTS OF AREA AND PERIMETER. 3.GR.C

6. Identify area as an attribute of a two-dimensional figure and measure area of rectangular space by counting square units (non-standard equal-sized units, square centimeters, square meters, square inches, square feet). 3.GR.C.6
7. Relate area to multiplication and addition. 3.GR.C.6.7
   - a. Determine the area of a rectangle with wholenumber side lengths by tiling and connecting the visual representation to multiplication of the side lengths to solve problems in context. 3.GR.C.6.7.A
   - b. Use tiling and area models to show that the area of a rectangle with whole number side lengths b and c + d is the sum of b × c and b × d, representing the Distributive Property of Multiplication. 3.GR.C.6.7.B
   - c. Determine the area of composite rectilinear figures by decomposing them into nonoverlapping rectangles and adding the areas. 3.GR.C.6.7.C
8. Identify perimeter as an attribute of two-dimensional figures and measure the distance around the outside of a figure by counting units or adding lengths. 3.GR.C.6.8
9. Solve problems in contexts involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and finding rectangles with the same perimeter and different areas or with the same area and different perimeters. 3.GR.C.6.9

Reasoning with Data and Statistics DS

A REPRESENT AND INTERPRET DATA. 3.DS.A

Skip to main content

1 Ask and answer questions by collecting, organizing and summarizing data, recognizing the importance of context when analyzing data. 3.DS.A.1

   a Create a scaled data visualization (e.g., picture graph, bar graph for categorial data; line plot with fraction units of halves and fourths for numerical data) to display collected or given data. 3.DS.A.1.A

   b Summarize data presented in scaled data visualizations (e.g., picture graph, bar graph for categorial data; line plot for numerical data) by describing the story the data is telling. 3.DS.A.1.B

   c Identify patterns in the data and evaluate whether these patterns might apply to different contexts or situations. 3.DS.A.1.C