



Ohio Grade 4 Math Learning Map

The Ohio Mathematics Academic Content Standards and Grade-Level Indicators are correlated in the map on the following page to LearningExpress's 4th Grade Math Diagnostic Skills. In the map, the official content standards are listed in an abbreviated format in the left-most column. To understand these abbreviations, please refer to following diagram:

The letter refers to the associated Ohio Mathematics Content Standard. In this example, "G" refers to "Geometry and Spatial Sense." The complete list of these abbreviations can be found below.

This number refers to the corresponding Ohio Mathematics Grade-Level Indicator. These official indicators correspond with the individual standards, and are listed on page 4 of this document.

G4.7

This number refers to the corresponding grade level.

Ohio Mathematics Content Standards Abbreviations Key	
N =	Number, Number Sense and Operations
M =	Measurement
G =	Geometry and Spatial Sense
A =	Patterns, Functions and Algebra
D =	Data Analysis and Probability

Ohio Mathematics Academic Content Standards and Grade-Level Indicators	4th Grade Math Diagnostic Skills	Supporting Practice Exercises
N4.8; N4.12	Addition of Decimals	4th Grade Math Practice: Number Sense & Operations 1 4th Grade Math Practice: Number Sense & Operations 2
N4.6; N4.12; N4.14	Addition of Whole Numbers	4th Grade Math Practice: Number Sense & Operations 1 4th Grade Math Practice: Number Sense & Operations 2
A4.1; A4.2; A4.3; A4.4	Analyzing Patterns	4th Grade Math Practice: Algebraic Thinking & Patterns
N4.1; N4.2; N4.5	Comparing Numbers	4th Grade Math Practice: Number Sense & Operations 1 4th Grade Math Practice: Number Sense & Operations 2
G4.2	Congruent Figures	4th Grade Math Practice: Geometry
G4.1; G4.5; G4.6	Coordinate Geometry	4th Grade Math Practice: Geometry
N4.6; N4.12; N4.14	Division of Whole Numbers	4th Grade Math Practice: Number Sense & Operations 1 4th Grade Math Practice: Number Sense & Operations 2
A4.5	Equations and Variables	4th Grade Math Practice: Algebraic Thinking & Patterns
N/A	Estimating Measurements	4th Grade Math Practice: Measurement
N4.9	Estimation	4th Grade Math Practice: Number Sense & Operations 1 4th Grade Math Practice: Number Sense & Operations 2
N/A	Functions	4th Grade Math Practice: Algebraic Thinking & Patterns
G4.2; G4.4	Geometric Figures	4th Grade Math Practice: Geometry
N4.1	Identifying Numbers	4th Grade Math Practice: Number Sense & Operations 1 4th Grade Math Practice: Number Sense & Operations 2
A4.5; A4.6	Inequalities and Variables	4th Grade Math Practice: Algebraic Thinking & Patterns
N/A	Inverse Operations	4th Grade Math Practice: Number Sense & Operations 1 4th Grade Math Practice: Number Sense & Operations 2
M1.2; M1.3; M1.4; M1.5	Linear Measurement	4th Grade Math Practice: Measurement
D4.10; D4.13	Listing Outcomes	4th Grade Math Practice: Data Analysis & Probability
A4.6	Mathematical Reasoning	4th Grade Math Practice: Algebraic Thinking & Patterns
M1.1; M1.2; M1.3	Measurement	4th Grade Math Practice: Measurement
N/A	Measurement and Time	4th Grade Math Practice: Measurement
M1.5;	Measurement Conversions	4th Grade Math Practice: Measurement
M1.3	Measurement Tools	4th Grade Math Practice: Measurement
N4.6; N4.14	Multiplication of Whole Numbers	4th Grade Math Practice: Number Sense & Operations 1 4th Grade Math Practice: Number Sense & Operations 2
N4.5	Number Line Locations	4th Grade Math Practice: Number Sense & Operations 1 4th Grade Math Practice: Number Sense & Operations 2
N4.1; N4.4	Number Properties	4th Grade Math Practice: Number Sense & Operations 1 4th Grade Math Practice: Number Sense & Operations 2
N4.4	Number Relationships	4th Grade Math Practice: Number Sense & Operations 1 4th Grade Math Practice: Number Sense & Operations 2

Ohio Mathematics Academic Content Standards and Grade-Level Indicators	4th Grade Math Diagnostic Skills	Supporting Practice Exercises
N4.1	Number Types	4th Grade Math Practice: Number Sense & Operations 1 4th Grade Math Practice: Number Sense & Operations 2
N4.1; N4.2; N4.3; N4.4; N4.6; N4.8; N4.9	Number Use and Applications	4th Grade Math Practice: Number Sense & Operations 1 4th Grade Math Practice: Number Sense & Operations 2
N4.2; N4.5	Ordering Numbers	4th Grade Math Practice: Number Sense & Operations 1 4th Grade Math Practice: Number Sense & Operations 2
M1.2; M1.3; M1.4	Perimeter, Area, and Volume	4th Grade Math Practice: Measurement
N4.2; N4.8	Place Value	4th Grade Math Practice: Number Sense & Operations 1 4th Grade Math Practice: Number Sense & Operations 2
A4.1; A4.2; A4.3; A4.4	Predicting Patterns	4th Grade Math Practice: Algebraic Thinking & Patterns
N4.3	Rounding Numbers	4th Grade Math Practice: Number Sense & Operations 1 4th Grade Math Practice: Number Sense & Operations 2
G4.2; G4.3	Similar Figures	4th Grade Math Practice: Geometry
D4.9; D4.10; D4.11; D4.12	Simple Probability	4th Grade Math Practice: Data Analysis & Probability
N4.8; N4.10; N4.12	Subtraction of Decimals	4th Grade Math Practice: Number Sense & Operations 1 4th Grade Math Practice: Number Sense & Operations 2
N4.6; N4.12; N4.14	Subtraction of Whole Numbers	4th Grade Math Practice: Number Sense & Operations 1 4th Grade Math Practice: Number Sense & Operations 2
N/A	Temperature	4th Grade Math Practice: Measurement
G4.7	Transformations	4th Grade Math Practice: Geometry
D4.1; D4.7; D4.8	Using Data	4th Grade Math Practice: Data Analysis & Probability
D4.2; D4.3; D4.4; D4.5; D4.6; D4.7; D4.8; D4.41	Using Graphs	4th Grade Math Practice: Data Analysis & Probability

Ohio Grade 4 Mathematics Grade-Level Indicators

Standard: Number, Number Sense and Operations Standard (N)

Grade-Level Indicators:

1. Identify and generate equivalent forms of fractions and decimals. For example:
 - a. Connect physical, verbal and symbolic representations of fractions, decimals and whole numbers; e.g., $1/2$, $5/10$ "five tenths," 0.5, shaded rectangles with half, and five tenths.
 - b. Understand and explain that ten tenths is the same as one whole in both fraction and decimal form.
2. Use place value structure of the base-ten number system to read, write, represent and compare whole numbers through millions and decimals through thousandths.
3. Round whole numbers to a given place value.
4. Identify and represent factors and multiples of whole numbers through 100, and classify numbers as prime or composite.
5. Use models and points of reference to compare commonly used fractions.
6. Use associative and distributive properties to simplify and perform computations; e.g., use left to right multiplication and the distributive property to find an exact answer without paper and pencil, such as $5 \times 47 = 5 \times 40 + 5 \times 7 = 200 + 35 = 235$.
7. Recognize that division may be used to solve different types of problem situations and interpret the meaning of remainders; e.g., situations involving measurement, money.
8. Solve problems involving counting money and making change, using both coins and paper bills.
9. Estimate the results of computations involving whole numbers, fractions and decimals, using a variety of strategies.
10. Use physical models, visual representations, and paper and pencil to add and subtract decimals and commonly used fractions with like denominators.
11. Develop and explain strategies for performing computations mentally.
12. Analyze and solve multi-step problems involving addition, subtraction, multiplication and division using an organized approach, and verify and interpret results with respect to the original problem.
13. Use a variety of methods and appropriate tools for computing with whole numbers; e.g., mental math, paper and pencil, and calculator.
14. Demonstrate fluency in adding and subtracting whole numbers and in multiplying and dividing whole numbers by 1- and 2-digit numbers and multiples of ten.

Standard: Measurement (M)

Grade-Level Indicators:

1. Relate the number of units to the size of the units used to measure an object; e.g., compare the number of cups to fill a pitcher to the number of quarts to fill the same pitcher.
2. Demonstrate and describe perimeter as surrounding and area as covering a two-dimensional shape, and volume as filling a three-dimensional object.
3. Identify and select appropriate units to measure:
 - a. perimeter – string or links (inches or centimeters).
 - b. area – tiles (square inches or square centimeters).
 - c. volume – cubes (cubic inches or cubic centimeters).

4. Develop and use strategies to find perimeter using string or links, area using tiles or a grid, and volume using cubes; e.g., count squares to find area of regular or irregular shapes on a grid, layer cubes in a box to find its volume.
5. Make simple unit conversions within a measurement system; e.g., inches to feet, kilograms to grams, quarts to gallons.
6. Write, solve and verify solutions to multi-step problems involving measurement.

Standard: Geometry and Spatial Sense Standard (G)

Grade-Level Indicators:

1. Identify, describe and model intersecting, parallel and perpendicular lines and line segments; e.g., use straws or other material to model lines.
2. Describe, classify, compare and model two- and three-dimensional objects using their attributes.
3. Identify similarities and differences of quadrilaterals; e.g., squares, rectangles, parallelograms and trapezoids.
4. Identify and define triangles based on angle measures (equiangular, right, acute and obtuse triangles) and side lengths (isosceles, equilateral and scalene triangles).
5. Describe points, lines and planes, and identify models in the environment.
6. Specify locations and plot ordered pairs on a coordinate plane, using first quadrant points.
7. Identify, describe and use reflections (flips), rotations (turns), and translations (slides) in solving geometric problems; e.g., use transformations to determine if two shapes are congruent.
8. Use geometric models to solve problems in other areas of mathematics, such as number (multiplication/division) and measurement (area, perimeter, border).

Standard: Patterns, Functions and Algebra Standard (A)

Grade-Level Indicators:

1. Use models and words to describe, extend and make generalizations of patterns and relationships occurring in computation, numerical patterns, geometry, graphs and other applications.
2. Represent and analyze patterns and functions using words, tables and graphs.
3. Construct a table of values to solve problems associated with a mathematical relationship.
4. Use rules and variables to describe patterns and other relationships.
5. Represent mathematical relationships with equations or inequalities.
6. Describe how a change in one variable affects the value of a related variable; e.g., as one increases the other increases or as one increases the other decreases.

Standard: Data Analysis and Probability Standard (D)

Grade-Level Indicators:

1. Create a plan for collecting data for a specific purpose.
2. Represent and interpret data using tables, bar graphs, line plots and line graphs.
3. Interpret and construct Venn diagrams to sort and describe data.
4. Compare different representations of the same data to evaluate how well each representation shows important aspects of the data, and identify appropriate ways to display the data.

5. Propose and explain interpretations and predictions based on data displayed in tables, charts and graphs.
6. Describe the characteristics of a set of data based on a graphical representation, such as range of the data, clumps of data, and holes in the data.
7. Identify the median of a set of data and describe what it indicates about the data.
8. Use range, median and mode to make comparisons among related sets of data.
9. Conduct simple probability experiments and draw conclusions from the results; e.g., rolling number cubes or drawing marbles from a bag.
10. Represent the likelihood of possible outcomes for chance situations; e.g., probability of selecting a red marble from a bag containing 3 red and 5 white marbles.
11. Relate the concepts of impossible and certain-to-happen events to the numerical values of 0 (impossible) and 1 (certain).
12. Place events in order of likelihood and use a diagram or appropriate language to compare the chance of each event occurring; e.g., impossible, unlikely, equal, likely, certain.
13. List and count all possible combinations using one member from each of several sets, each containing 2 or 3 members; e.g., the number of possible outfits from 3 shirts, 2 shorts and 2 pairs of shoes.