Washington Mathematics

Grade 4

Standards for Mathematical Practice

1 **Make sense of problems and persevere in solving them.** 1

2 **Reason abstractly and quantitatively.** 2

3 **Construct viable arguments and critique the reasoning of others.** 3

4 **Model with mathematics.** 4

5 **Use appropriate tools strategically.** 5

6 **Attend to precision.** 6

7 **Look for and make use of structure.** 7

8 **Look for and express regularity in repeated reasoning.** 8

Operations and Algebraic Thinking

A Use the four operations with whole numbers to solve problems.

1 Interpret a multiplication equation as a comparison, e.g., interpret 35 = 5 × 7 as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent these verbal comparison statements as multiplication equations. 4.OA.A.1

2 Multiply or divide to flexibly, efficiently, and accurately solve word problems involving multiplicative comparison, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison. 4.OA.A.2

3 Flexibly, efficiently, and accurately solve multistep word problems posed with whole numbers and having whole number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using visual models and equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental and estimation strategies. 4.OA.A.3

B Gain familiarity with factors and multiples.

4 Find all factor pairs for a whole number in the range 1–100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1–100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1–100 is prime or composite. 4.OA.B.4

C Generate and analyze patterns.

5 Generate a number or shape pattern that follows a given rule. Identify and explain apparent features of the pattern that were not explicit in the rule itself. Explain informally why the numbers will continue to alternate in this way. 4.OA.C.5

Numbers and Operations in Base Ten

A Generalize place value understanding for multi-digit whole numbers.

1 Understand that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right. 4.NBT.A.1

2 Read and write and compare multi-digit whole numbers using base-ten numerals, number names, and expanded form using the meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons. 4.NBT.A.2

3 Use place value understanding of multi-digit whole numbers to generate estimates to any place less than or equal to 1,000,000 using a variety of estimation strategies. 4.NBT.A.3

B Use place value understanding and properties of operations to perform multidigit arithmetic.

4 Flexibly, efficiently, and accurately add and subtract multi-digit whole numbers using strategies or algorithms. 4.NBT.B.4

5 Flexibly, efficiently, and accurately multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models. 4.NBT.B.4

6 Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using multiple strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models. 4.NBT.B.4

Numbers and Operations—Fractions

A Extend understanding of fraction equivalence and ordering.

1 Explain why a fraction is equivalent to another fraction by using visual fraction models (e.g., tape diagrams and number lines), with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Understand and use general principles to recognize and generate equivalent fractions. 4.NF.A.1

2 Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as . Understand that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols or and justify the conclusions, e.g., by using a visual fraction model. 4.NF.A.2

B Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.

3 Flexibly, efficiently, and accurately compose and decompose fractions with a numerator greater than 1 into unit fractions, including fractions greater than one or mixed numbers, to solve situations in context with addition and subtraction of fractions with like denominators. 4.NF.B.3

4 Flexibly apply and extend previous understandings of multiplication to multiply a fraction by a whole number using visual models in the context of word problems. 4.NF.B.4

C Understand decimal notation for fractions, and compare decimal fractions.

5 Explore and explain using models, words, and numbers that a fraction with a denominator of 10 is an equivalent fraction with denominator of 100, and use this technique to add two fractions with respective denominators of 10 and 100. 4.NF.C.5

6 Explore and explain decimal notation for fractions with denominators of 10 and 100 using models, words, and numbers. 4.NF.C.6

7 Compare two decimals to hundredths by reasoning about their size. Understand that comparisons are valid only when the two decimals refer to the same whole. Record the results of comparisons with the symbols , or and justify the conclusions by using multiple strategies or visual models. 4.NF.C.7

Measurement and Data

A Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.

1 Know relative sizes of measurement units within one system of units including . and express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table. 4.MD.A.1

2 Use the four operations to flexibly, efficiently, and accurately solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using multiple visual models. 4.MD.A.2

3 Apply the area and perimeter formulas for rectangles in real world and mathematical problems. 4.MD.A.3

B Represent and Interpret Data.

4 Make a line plot to display a data set of measurements in fractions of a unit. Flexibly, efficiently, and accurately solve problems involving addition and subtraction of fractions by using information presented in line plots. 4.MD.B.4

C Geometric measurement: understand concepts of angles and measure angles.

5 Demonstrate understanding of angles as geometric shapes that are formed wherever two rays share a common endpoint and understand concepts of angle measure. 4.MD.C.5

6 Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure. 4.MD.C.6

7 Demonstrate understanding that when an angle is decomposed into non-overlapping parts, the angle measure of the whole is the sum of the angle measures of the parts. Flexibly, efficiently, and accurately solve addition and subtraction problems to find unknown angles on a diagram in real world and mathematical problems. 4.MD.C.7

Geometry

A Draw and identify lines and angles and classify shapes by properties of their lines and angles.

1 Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures. 4.G.A.1

2 Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specified size. Recognize right triangles as a category and identify right triangles. 4.G.A.2

3 Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts. Identify line-symmetric figures and draw lines of symmetry. 4.G.A.3

Data Science

Formulate statistical investigative questions.

1 Generate data-based questions of interest to the students, generate ideas based on the questions, and refine the question as necessary. 4.DS.1

Collect data/ consider data.

2 Determine strategies for collecting and considering data in a variety of ways including with the use of technology, evaluate whether additional data that should be collected to completely address the investigative question. 4.DS.2

Analyze the data.

3 Critically analyze data visualizations, including tables, bar graphs, line plots, or spreadsheets to support a claim related to the investigative question. Ask whether the data collected sufficiently addresses the investigative question. 4.DS.3

Interpret results.

4 Interpret and communicate results, describing difference between groups, with teacher guidance. Make a statement(s) about the data collected to support the answer to the investigative question. 4.DS.4