



## WWPS Promise Standards K-8 Math

In Walla Walla Public Schools, we operate in an aligned and coherent system. This means students will receive access to the same promise standards no matter which school they attend. During the spring of 2022, K-8 teachers came together to identify 8-12 promise standards per grade level to ensure consistency across schools, and to ensure all students progress to the next level with the same foundation of skills. This document summarizes the standards for which all students will receive instruction and support to achieve proficiency. The color-coding indicates similar domains across grade levels to see how skills progress.

Counting and Cardinality (K), Fractions (3-5), Ratios (6-7) , Functions (8)  
Operations and Algebraic Thinking (K-5), Expressions and Equations (6-8)  
Numbers and Operations Base 10 (K-5), Number System (6-8)  
Measurement and Data (K-5)  
Geometry (K-8)

### Kindergarten

- Count to 100 by ones and by tens
- Count forward beginning from a given number in a known sequence.
- Write numbers 0-20. Represent a number of objects with a written numeral 0-20.
- Understand the relationship between numbers and quantities; connect counting to cardinality.
- Identify whether the number of objects in one group is greater than, less than, or equal to the number of objects in another group
- Compare two numbers between 1 and 10 presented as written numerals.
- Solve addition and subtraction word problems, and add and subtract within 10.
- Fluently add and subtract within 5.
- Compose and decompose numbers from 11 to 19 into ten ones and some further ones.

### First Grade

- Use addition and subtraction within 20 to solve word problems
- Add and subtract within 20, demonstrating fluency for addition and subtraction within 10.
- Understand the meaning of the equal sign, and determine if equations involving addition and subtraction are true or false.
- Determine the unknown whole number in an addition or subtraction equation relating three whole numbers
- Count to 120, starting at any number less than 120. In this range, read and write numerals.
- Understand that the two digits of a two-digit represent amounts of tens and ones.
- The numbers from 11 to 19 are composed of a ten and one, two, three, four, five, six, seven, eight, or nine ones.
- Order three objects by length; compare the lengths of two objects indirectly using a third object.

### Second Grade

- Use addition and subtraction within 100 to solve one-and two- step word problems.
- Fluently add and subtract within 20 using mental strategies.
- Understand that the three digits of a three-digit number represent amounts of hundreds, tens, ones.
- Fluently add and subtract within 1000, using strategies based on place value.
- Add and subtract within 1000, using concrete models or drawings and strategies based on place value.
- Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.
- Tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m.
- Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using \$ and ¢ symbols appropriately.
- Draw a picture graph and a bar graph to represent data set with up to four categories. Solve simple put-together, take- apart, and compare problems using information presented in a bar graph.
- Partition a rectangle into rows and columns of same-size squares and count to find the total number of them.

### Third Grade

- Understand a fraction as the quantity formed by 1 part when a whole is partitioned into  $b$  equal parts; understand a fraction as the quantity formed by a part of size.
- Understand a fraction as a number on the number line; represent fractions on a number line diagram.
- Interpret products of whole numbers, e.g., interpret  $5 \times 7$  as the total number of objects in 5 groups of 7 objects each.
- Interpret whole-number quotients of whole numbers
- Understand division as unknown-factor problem.
- Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division. By the end of Grade 3, know from memory all products of two one-digit numbers. (up to  $9 \times 9$  memorized)
- Fluently add and subtract within 1,000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.
- Tell and write time to the minute and measure time interval in minutes. Solve word problems involving addition and subtraction of time intervals in minutes.
- Find the area of 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.

### Fourth Grade

- Explain why a fraction  $a/b$  is equivalent to a fraction  $(n \times a) / (n \times b)$  by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size.
- Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.
- Add and subtract mixed numbers with like denominators.
- Compare two decimals to hundredths by reasoning about their size. Record the results of the comparisons with the symbols  $>$ ,  $=$ , or  $<$  and justify the conclusions.
- Multiply or divide to solve word problems involving multiplicative comparison.
- Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right.
- Fluently add and subtract multi-digit whole numbers using the standard Algorithm.
- 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.
- Find whole-number quotients and remainders with up to four digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division.
- Apply the area and perimeter formulas for rectangles in real world and mathematical problems.

### Fifth Grade

- Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions.
- Find the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas.
- Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions.
- Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.
- Read, write, and compare decimals to thousandths.
- Fluently multiply multi-digit whole numbers using the standard algorithm.
- Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division.
- Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.
- Find the volume of a right rectangular prism with whole number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base.
- Apply the formulas  $V = l \times w \times h$  and  $V = b \times h$  for rectangular prisms to find volumes of right rectangular prisms with whole number edge lengths in the context of solving real world and mathematical problems.
- Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.

## Grade 6

- Make tables of equivalent ratios relating quantities with whole-number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios.
- Solve unit rate problems including those involving unit pricing and constant speed.
- Write and evaluate numerical expressions involving whole number exponents.
- Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order.
- Apply the properties of operations to generate equivalent expressions.
- Solve real-world and mathematical problems by writing and solving equations of the form  $x + p = q$  and  $px = q$  for cases in which  $p$ ,  $q$ , and  $x$  are all nonnegative rational numbers.
- Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. For example, in a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and write the equation  $d = 65t$  to represent the relationship between distance and time.
- Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g. by using visual fraction models and equations to represent the problem.
- Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.
- Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two whole numbers 1–100 with a common factor as a multiple of a sum of two whole numbers with no common factor. For example, express  $36 + 8$  as  $4(9 + 2)$ .
- Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane.
- Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles, and other shapes; apply these techniques in the context of solving real-world and mathematical problems.

## Grade 7

- Decide whether two quantities are in a proportional relationship, e.g. by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin.
- Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.
- Represent proportional relationships by equations.
- Explain what a point  $(x, y)$  on the graph of a proportional relationship means in terms of the situation, with special attention to the points  $(0,0)$  and  $(1,r)$  where  $r$  is the unit rate.
- Apply properties of operations as strategies to add, subtract factor, and expand linear expressions with rational coefficients.
- Solve word problems leading to equations of the form  $Px + q = r$  and  $p(x + q) = r$ , where  $p$ ,  $q$  and  $r$  are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach.
- Describe the situations in which opposite quantities combine to make 0.
- Apply properties of operations as strategies to add and subtract rational numbers. (intervene on integers only)
- Apply properties of operations as strategies to multiply and divide rational numbers. (intervene on integers only)

- Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions (e.g.,  $\pi^2$ ). For example, by truncating the decimal expansion of  $\sqrt{2}$ , show that  $\sqrt{2}$  is between 1 and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations.
- Use square root and cube root symbols to represent solutions to equations of the form  $x^2 = p$  and  $x^3 = p$ , where  $p$  is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that  $\sqrt{2}$  is irrational.
- Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways.
- Use similar triangles to explain why the slope  $m$  is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation  $y = mx$  for a line through the origin and the equation  $y = mx + b$  for a line intercepting the vertical axis at  $b$ .
- Give examples of linear equations in one variable with one solution, infinitely many solutions or no solutions
- Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions distributive property and collecting like terms
- Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously.
- Interpret the equation  $y = mx + b$  as defining a linear function, whose graph is a straight line; give examples of functions that are not linear.
- Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two  $(x, y)$  values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.
- Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.
- Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and angle-angle criterion for similarity triangles.
- Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.