Mathematics Arts State Standards Grade 4

Fourth grade students develop fluency with multi-digit multiplication and division with multi-digit dividends. They deepen their understanding of fraction equivalence and operations with fractions. Students analyze and classify geometric figures based on properties. Fourth graders analyze patterns in operations, use equations and models to represent word problems, and understand the relationship between fractions and decimals.

Standards for Mathematical Practice – "HOW" My student can:

- ☐ explain a math problem, create & use a plan to solve it, and check if the answer makes sense.
- ☐ make sense of and flexibly use math symbols, numbers, and operations. use objects, drawings, diagrams, actions and words to explain his/her approach to a math problem and decide if others' strategies make sense.
- ☐ recognize math in everyday life and use math to solve real problems. use tools (e.g., ruler, concrete models, paper/pencil) to solve problems and deepen understanding.
- ☐ calculate accurately, use precise math vocabulary, and explain problems/solutions clearly.
- ☐ describe how numbers and shapes are organized as parts and wholes. notice when calculations are repeated and look for general "rules" and shortcuts.

Math Content Standards – "WHAT" Addition, Subtraction, Multiplication and Division (Operations and Algebraic Thinking) My student can:

- ☐ understand that multiplication equations are comparisons (e.g., 24 = 4 x 6 shows that 24 is 4 times as many as 6 and 6 times as many as 4). 4.OA.1
- ☐ multiply or divide to solve word problems involving multiplicative comparisons (e.g., by using drawings or writing equations and solving for a missing number). 4.OA.2

- [ ]
- [ ] use addition, subtraction, multiplication and division to solve multi-step word problems, including problems with remainders. 4.OA.3

  represent word problems using equations with a letter standing for the unknown number. 4.OA.3
- [ ] use mental math and estimation to assess whether an answer is reasonable. 4.OA.3
- [ ] find all factor pairs for a whole number from 1 to 100; recognize that a whole number is a multiple of each of its factors. 4.OA.4
- [ ] determine whether a given whole number (up to 100) is a prime or composite number. 4.OA.4
- [ ] create a number or shape pattern that follows a given rule; notice the features of the pattern that are not obvious in the rule itself. For example, use the rule "add 3" and the starting number 1 to generate a number sequence. Observe that the numbers alternate between odd and even numbers.

Explain why the numbers will continue to alternate this way. 4.OA.5 Number Sense and Place Value (Number and Operations in Base Ten) My student can:

- [ ] 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. 4.NBT.1
- [ ] read and write whole numbers to 1,000,000 using base-ten numerals (9,462 = 9 thousands, 4 hundreds, 6 tens, & 2 ones), number names (9,462 = nine thousand four hundred sixty-two), and expanded form (9,462 = 9,000 + 400 + 60 + 2). 4.NBT.2
- [ ] compare two large numbers using <, =, and > symbols. 4.NBT.2
- [ ] round multi-digit whole numbers to any place (e.g., round 54,863 to the nearest thousand). 4.NBT.3
- [ ] quickly and easily add and subtract large numbers. 4.NBT.4
- [ ] multiply a whole number up to four-digits by a one-digit whole number using varied strategies. 4.NBT.5
- [ ] multiply two two-digit whole numbers using varied strategies. 4.NBT.5
- [ ] find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors using varied strategies; explain calculations with equations, drawings or models. 4.NBT.6

Fractions (Number and Operations

My student can:

- [ ] explain (verbally and with models) why multiplying a fraction's numerator and denominator by the same number does not change the value of the fraction. 4.NF.1

- [ ] compare two fractions with different numerators and different denominators by creating common denominators or numerators or by comparing them to a benchmark fraction like 1/2. 4.NF.2
- [ ] compare fractions using <, =, and > symbols and justify the comparison by using models. 4.NF.2
- [ ] understand + and - of fractions as joining and separating parts referring to the same whole. 4.NF.3
- [ ] in more than one way, decompose a fraction into a sum of fractions with the same denominator (e.g., 3/8 = 1/8 + 1/8 + 1/8 -and- 3/8 = 1/8 + 2/8). 4.NF.3
- [ ] add and subtract mixed numbers with like denominators. 4.NF.3
- [ ] solve word problems involving addition and subtraction of fractions with like denominators. 4.NF.3
- [ ] multiply a fraction by a whole number. 4.NF.4
- [ ] solve word problems involving multiplication of a fraction by a whole number. 4.NF.4
- [ ] show a fraction with a denominator of 10 as an equivalent fraction with a denominator of 100 in order to add the two fractions (change 3/10 to 30/100 in order to add 3/10 + 4/100 = 34/100). 4.NF.5
- [ ] use decimals to show fractions with denominators of 10 and 100 (.62 = 62/100; 4/10 = .4). 4.NF.6
- [ ] compare two decimals to the hundredths place by reasoning about their size; use <, =, and > symbols to show the comparison and justify the conclusions by using the number line or other visual model. 4.NF.7

Measurement and Data My student can:

- [ ] explain the relative size of measurement units within one system (e.g., km, cm; hr, min, sec). 4.MD.1
- [ ] express the measurements of a larger unit in terms of smaller units (e.g., a 4-foot snake is 48 inches long); record measurement equivalents in a two-column table. 4.MD.1
- [ ] use +, -, x, and ÷ to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, money and measurements, including problems with simple fractions and decimals. 4.MD.2
- [ ] apply formulas for area and perimeter of rectangles to solve real world & math problems. 4.MD.3
- [ ] make a line plot to show measurements involving fractions. 4.MD.4
- [ ] use information on line plots to solve problems involving addition and subtraction of fractions. 4.MD.4
- [ ] recognize angles as geometric shapes where two rays share a common end point. 4.MD.5

☐ understand that angles are measured with reference to a circle. 4.MD.5 use a protractor to measure angles in whole-number degrees; sketch angles using a protractor. 4.MD.6

☐ solve addition and subtraction problems to find unknown angles on a diagram. 4.MD.7

Geometry

My student can:

☐ identify and draw points, lines, line segments, rays, angles and perpendicular and parallel lines. 4.G.1

☐ classify two-dimensional shapes based on parallel & perpendicular lines and specific angles. 4.G.2

☐ recognize and identify right, equilateral, isosceles and scalene triangles. 4.G.2 ☐ recognize and draw lines of symmetry. 4.G.3