**Fairview Elementary** - **Numbers and Operations in Base Ten – ESSENTIAL KNOWLEDGE AND SKILLS FOR STUDENTS TO ACHIEVE BY THE END OF THE SCHOOL YEAR BY GRADE.**

| Kindergarten | First | Second | Third | Fourth | Fifth |
|---|---|---|---|---|---|
| **Counting and Cardinality**<br>• Know number names to 100.<br>• Count in sequence.<br>• Count and tell number of objects.<br>• Compare numbers. | **Numbers and Operations in Base Ten**<br>• Extend understanding of counting sequence.<br>• Understand place value (units and tens).<br>• Use place value to add and subtract. | **Numbers and Operations in Base Ten**<br>• Understand place value (units, tens and hundreds).<br>• Use place value understanding and properties of operations to add and subtract. | **Numbers and Operations in Base Ten**<br>Use place value understanding and properties of operations to perform multi-digit arithmetic.<br>**Numbers and Operations – Fractions**<br>Develop understanding of fractions as numbers. | **Numbers and Operations in Base Ten:** Generalize place value understanding; use P.V. understanding for multi-digit arithmetic<br>**Numbers and Operations – Fractions:** Extend understanding of equivalence and ordering. Understand +/- of fractions. Apply and extend knowledge of multiplication to fractions | **Numbers and Operations in Base Ten**<br>Perform operations with multi-digit whole numbers and with decimals to hundredths.<br>**Numbers and Operations – Fractions**<br>Use equivalent fractions for +/- Apply and extend understanding of multiplication/division to fractions. |
| **Success Criteria**<br>Students will be able to:<br>• Count to 100 from 1 in correct sequence<br>• Use units (ones) and tens pieces to accurately model model numbers from 11-19.<br>• Use drawings, to demonstrate understanding of decomposition of teens.<br>• Record each composition or decomposition equation (e.g., 18 = 10 + 8); | **Success Criteria**<br>• Count to 120 starting from any previous #.<br>• Draw representations of base ten pieces that accurately show numbers 11-19.<br>• Count on from higher number in addition problems.<br>• Use base ten pieces and drawing to represent addition and subtraction of numbers up to two digits.<br>• Given a two-digit number, mentally find 10 more or 10 less without having to count. Explain reasoning. | **Success Criteria**<br>• Show understanding that a bundle of ten tens is called a "hundred"<br>• Read and write numbers to 1000 and show in expanded form.<br>• Count within 1000; skip-count by 5s, 10s, and 100s.<br>• Compare values of two three digit numbers.<br>• Add and subtract within 1000, using concrete models or drawings.<br>• Mentally add 10 or 100 to a given number 100–900, and mentally subtract 10 or 100 from a given number 100–900.<br>• Explain why addition and subtraction strategies work | **Success Criteria – whole numbers**<br>• Round whole numbers to the nearest 10 or 100.<br>• +/– within 1,000 with regrouping in tens, hundreds and thousands.<br>• Representation of regrouping with base-ten pieces and drawing.<br>• Multiply one-digit whole numbers by multiples of 10 in the range 10–90<br>**Success Criteria – fractions**<br>• Understand what numerator and denominator in fractions represent.<br>• Understand fraction as number on a number line – can locate and compare.<br>• Show that equivalent fractions are the same size. | **Success Criteria – whole numbers**<br>• Write and read numbers to 1,000,000.<br>• Use place value understanding to round numbers to nearest 10, 100, 1000.<br>• Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers.<br>• Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors.<br>**Success Criteria – fractions**<br>• Recognize and generate equivalent fractions with fraction pieces and drawings.<br>• Find common denominators for addition and subtraction.<br>• Multiply fraction by a whole number | **Success Criteria**<br>-Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left.<br>-Understand the relationship between fractions and decimals.<br>-Use place value understanding to round decimals to any place.<br>- Illustrate and explain multiplication calculation by using equations, rectangular arrays, and/or area models.<br>-Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings.<br>-Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions<br>- Interpret a fraction as division of the numerator by the denominator. |

**Operations and Algebraic Thinking**

| Kindergarten | First | Second | Third | Fourth | Fifth |
|---|---|---|---|---|---|
| 1. **Understand addition** as putting together and adding to.<br>2. **Understand subtraction** as taking apart and taking from. | 1. Represent and solve problems involving addition and subtraction.<br>2. Understand and apply properties of operations and the relationship between addition and subtraction.<br>3. Add and subtract within 20. | 1. Represent and solve problems involving addition and subtraction.<br>2. Add and subtract fluently within 20.<br>3. Work with equal groups of objects to gain foundations for multiplication. | 1. Represent and solve problems involving multiplication and division.<br>2. Understand properties of multiplication and the relationship between multiplication and division.<br>3. Multiply and divide within 100.<br>4. Solve problems involving the four operations, and identify and explain patterns in arithmetic. | 1. Use the four operations with whole numbers to solve problems.<br>2. Gain familiarity with factors and multiples.<br>3. Generate and analyze patterns. | 1. Write and interpret numerical expressions.<br>2. Analyze patterns and relationships. |
| **Success Criteria**<br>• Represent addition and subtraction with objects, fingers, drawings, sounds (e.g., claps), acting out situations, explanations, or equations.<br>• Solve addition and subtraction problems within 10.<br>• Find digit pairs that equal 10.<br>• Fluent in addition and subtraction within 5 | **Success Criteria**<br>• Solve addition and subtraction problems within 20 <u>with unknowns in all positions</u>, by using objects, drawings, and equations with a symbol for the unknown number.<br>• Solve addition word problems with three whole numbers whose sum is less than or equal to 20.<br>• Understand subtraction as an unknown-addend problem.<br>• Can count-on to add. Count back to subtract.<br>• Show fluency adding and subtraction within ten. Can add and subtract within 20. | **Success Criteria**<br>• Can add and subtract within 100 to solve one- and two-step word problems with: adding to; taking from; putting together; taking apart; and comparing – <u>with unknowns in all positions.</u><br>• Fluently add and subtract within 20 using mental strategies. Memorize all sums of two one-digit numbers by end of grade 2.<br>• Determine whether a group of objects has an odd or even number of members by pairing objects or counting them by 2s.<br>• Able to use rectangular arrays with up to 5 rows and up to 5 columns to write repeated addition problems. EXTENSION-represent as multiplication equation. | **Success Criteria**<br>• Understand product as sum of equal sets (groups).<br>• Understand quotient as the number of objects in each equal set.<br>• Use multiplication and division within 100 to solve word problems (equal groups and arrays).<br>• Determine the unknown whole number in a multiplication or division equation.<br>• Fluently multiply and divide within 100.<br>• Solve two-step word problems using the four operations.<br>• Identify arithmetic patterns, and explain them using properties of operations. | **Success Criteria**<br>• 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.<br>• Multiply or divide to solve word problems involving multiplicative comparison, distinguishing multiplicative comparison from additive comparison.<br>• Solve multistep word problems posed with whole numbers including problems wit remainders. Represent these problems using equations with a letter standing for the unknown quantity.<br>• Find all factor pairs for a whole number in the range 1–100. | **Success Criteria**<br>• Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.<br>• Write simple expressions that record calculations with numbers, interpret expressions without evaluating them.<br>• Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs.<br>eg. 2(n+3) = 2n+6. |

**Measurement and Data** Pink shaded area represents - **Second level priority**

| Kindergarten | First | Second | Third | Fourth | Fifth |
|---|---|---|---|---|---|
| 1. Describe and compare measurable attributes.<br>2. Classify objects and count the number of objects in categories. | 1. Measure lengths indirectly and by iterating length units.<br>2. Tell and write time.<br>3. Represent and interpret data. | 1. Measure and estimate lengths in standard units.<br>2. Relate addition and subtraction to length.<br>3. Work with time and money.<br>4. Represent and interpret data. | 1. Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects.<br>2. Represent and interpret data. | 1. Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.<br>2. Represent and interpret data. | 1. Understand concepts of volume.<br>2. Convert like measurements within a given measurement system.<br>3. Represent and interpret data |
| **Success Criteria**<br>• Describe measurable attributes of objects *(tall, short, heavy, light)* and compare objects *(taller…)*<br>• Classify objects into categories. | **Success Criteria**<br>• Order three objects by length and compare *(taller, tallest…).*<br>• Use multiple copies of uniform length to measure object and give a whole number measurement of object.<br>• Tell and write time in hours and half-hours using analog and digital clocks.<br>• Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another. | **Success Criteria**<br>• Measure the length of an object by selecting and using appropriate tools.<br>• Estimate lengths using units of inches, feet, centimeters, and meters.<br>• Measure to determine how much longer one object is than another.<br>• Use addition and subtraction within 100 to solve word problems involving lengths that are given in the same units, e.g., by using drawings of number lines and equations with a symbol for the unknown number to represent the problem.<br>• Tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m.<br>• Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using $ and ¢ symbols appropriately<br>• Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. | **Success Criteria**<br>• Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes.<br>• Measure and estimate liquid volumes and masses of objects using standard units.<br>• Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units<br>• Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step “how many more” and “how many less” problems using information presented in scaled bar graphs.<br>• Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. | **Success Criteria**<br>• Know relative sizes of measurement units within a single system of measurement.<br>• Express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table.<br>• Use the four operations to 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.<br>• Apply the area and perimeter formulas.<br>• Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). | **Success Criteria**<br>• Recognize volume as an attribute of solid figures and understand concepts of volume measurement. a. A cube with side length 1 unit, called a “unit cube,” is said to have “one cubic unit”<br>• Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume.<br>• Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.<br>• Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Use operations on fractions for this grade to solve problems involving information presented in line plots. |

**Geometry** **Second level priority**

| Kindergarten | First | Second | Third | Fourth | Fifth |
|---|---|---|---|---|---|
| 1. Identify and describe shapes (squares, circles, triangles, rectangles, hexagons, cubes, cones, cylinders, and spheres).<br>2. Analyze, compare, create, and compose shapes. | Reason with shapes and their attributes. | Reason with shapes and their attributes. | 1. Geometric measurement: a) understand concepts of area and relate area to multiplication and to addition. b) Geometric measurement: recognize perimeter as an attribute of plane figures and distinguish between linear and area measures.<br>2. Reason with shapes and their attributes. | 1. Geometric measurement: understand concepts of angle and measure angles.<br>2. Draw and identify lines and angles, and classify shapes by properties of their lines and angles. | 1. Graph points on the coordinate plane to solve real-world and mathematical problems.<br>2. Classify two-dimensional figures into categories based on their properties |
| **Success Criteria**<br>• Describe objects in the environment using names of shapes, and describe the relative positions of these objects using terms such as *above, below, beside, in front of, behind*, and *next to*.<br>• Correctly name shapes regardless of their orientations or overall size<br>• Identify shapes as two-dimensional (lying in a plane, "flat") or three-dimensional ("solid").<br>• Analyze and compare two- and three-dimensional shapes, in different sizes and orientations, using informal language to describe their similarities, differences, parts and other attributes.<br>• Model shapes in the world by building shapes from components. | **Success Criteria**<br>• Distinguish between defining attributes (e.g., triangles are closed and three-sided) versus non-defining attributes (e.g., color, orientation, overall size); build and draw shapes to possess defining attributes.<br>• Compose two-dimensional shapes, or three-dimensional shapes to create a composite shape, and compose new shapes from the composite shape.<br>• Partition circles and rectangles into two and four equal shares, describe the shares using the words halves, fourths, and quarters, and use the phrases half of, fourth of, and quarter of. | **Success Criteria**<br>• Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces. (Sizes are compared directly or visually, not compared by measuring.) Identify triangles, quadrilaterals, pentagons, hexagons, and cubes.<br>• Partition a rectangle into rows and columns of same-size squares and count to find the total number of them.<br>• Partition circles and rectangles into two, three, or four equal shares, describe the shares using the words halves, thirds, half of, a third of, etc., and describe the whole as two halves, three thirds, four fourths. | **Success Criteria**<br>• Recognize area as an attribute of plane figures and understand concepts of area measurement. Measure areas by counting unit squares<br>• Relate area to the operations of multiplication and addition<br>• Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters.<br>• Understand that shapes in categories share attributes, and that the shared attributes can define a larger category. | **Success Criteria**<br>• Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement.<br>• Measure angles in whole-number degrees using a protractor.<br>• Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines<br>• Recognize right triangles as a category, and identify right triangles.<br>• Recognize a line of symmetry for a two-dimensional figure<br>• Identify line-symmetric figures and draw lines of symmetry. | **Success Criteria**<br>• Use a pair of perpendicular number lines, called axes, to define a coordinate system. (e.g., x- axis and x-coordinate, y-axis and y-coordinate).<br>• 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.<br>• Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. For example, all rectangles have four right angles and squares are rectangles, so all squares have four right angles.<br>• Classify two-dimensional figures in a hierarchy based on properties. |