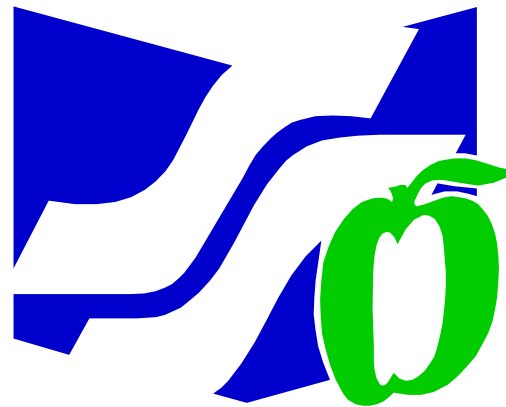


School District of Superior
Grade Level Performance
Standards



SUPERIOR SCHOOLS

MATH

GRADES 3-5

Updated 2006

Wisconsin Standard A: MATHEMATICAL PROCESSES

CONTENT STANDARD: Students in the School District of Superior will draw on a broad body of mathematical knowledge and apply a variety of mathematical skills and strategies, including reasoning, communication and use of appropriate technology, when solving mathematical, real-world and non-routine problems.

<i>By the end of grade FOUR, students will:</i>	<i>By the end of grade EIGHT, students will:</i>
<p>A.4.1 Use reasoning abilities to:</p> <ul style="list-style-type: none"> • Perceive patterns • Identify relationships • Formulate questions for further exploration • Justify strategies • Test reasonableness of results <p>A.4.2 Communicate mathematical ideas in a variety of ways, including words, numbers, symbols, pictures, charts, graphs, tables, diagrams, and models.</p> <p>A.4.3 Connect mathematical learning with other subjects, personal experiences, current events, and personal interests.</p> <ul style="list-style-type: none"> • See relationships between various kinds of problems and actual events • Use mathematics as a way to understand other areas of the curriculum (e.g., <i>measurement in science, map skills in social studies</i>) <p>A.4.4 Use appropriate mathematical vocabulary, symbols, and notation with understanding based on prior conceptual work.</p> <p>A.4.5 Explain solutions to problems clearly and logically in oral and written work and support solutions with evidence.</p>	<p>A.8.1 Use reasoning abilities to:</p> <ul style="list-style-type: none"> • Evaluate information • Perceive patterns • Identify relationships • Formulate questions for further exploration • Evaluate strategies • Justify statements • Test reasonableness of results • Defend work <p>A.8.2 Communicate logical arguments clearly to show why a result makes sense.</p> <p>A.8.3 Analyze non-routine problems by modeling, illustrating, guessing, simplifying, generalizing, shifting to another point of view, etc.</p> <p>A.8.4 Develop effective oral and written presentations that include:</p> <ul style="list-style-type: none"> • Appropriate use of technology • The conventions of mathematical discourse (e.g., symbols, definitions, labeled drawings) • Mathematical language • Clear organization of ideas and procedures • Understanding of purpose and audience <p>A.8.5 Explain mathematical concepts, procedures, and ideas to others who may not be familiar with them.</p> <p>A.8.6 Read and understand mathematical texts and other instructional materials and recognize mathematical ideas as they appear in other contexts.</p>

RATIONALE: In order to participate fully as a citizen and worker in our contemporary world, a person should be mathematically powerful. Mathematical power is the ability to explore, to conjecture, to reason logically and to apply a wide repertoire of methods to solve problems. Because no one lives and works in isolation, a world, it is also important to have the ability to communicate mathematical ideas clearly and effectively.

School District of Superior STANDARD A: MATHEMATICAL PROCESSES

Grade Level Performance Standards: *The student will...*

GRADE 3	GRADE 4	GRADE 5									
<p>A.3.1 Use reasoning abilities to:</p> <ul style="list-style-type: none"> • Analyze patterns in the numeration system (<i>number line, hundreds chart</i>). • Recognize, create, describe and extend more complex patterns using a variety of stimuli build 2 step patterns. • Formulate meaningful questions for further exploration and efficiency. • Use logical reasoning to justify strategies. • Verify correctness of a procedure using concrete models or symbolic methods. <p>A.3.2 Communicate mathematical ideas in a variety of ways, including words, numbers, symbols, pictures, charts, graphs, tables, diagrams, and models.</p> <ul style="list-style-type: none"> • Read and produce graphs, tables, charts, and diagrams to communicate mathematical ideas. <p>A.3.3 Connect mathematical learning with other subjects, personal experiences, current events, and personal interests.</p> <ul style="list-style-type: none"> • Recognize the connection between math and other curricular areas (<i>including the fine arts</i>). <ul style="list-style-type: none"> ○ Patterns in art, music, phy. ed., literature, spelling, science, social studies ○ Measurement in art, music, phy. ed., literature, spelling, science, social studies ○ Balance in art, music, etc. • Connect mathematics to the real world, as well as within mathematics. <p>A.3.4 Use appropriate mathematical vocabulary, symbols, and notation with understanding based on prior conceptual work.</p> <ul style="list-style-type: none"> • Communicate mathematical ideas and reasoning using the vocabulary of mathematics. <p>A.3.5 Explain solutions to problems clearly and logically in oral and written work and support solutions with evidence.</p> <ul style="list-style-type: none"> • Continue to show understanding of story problems by developing and explaining own strategies and algorithms. • Willingly participate in and communicate own strategies for problem solving. 	<p>A.4.1 Use reasoning abilities to:</p> <ul style="list-style-type: none"> ▪ Use reasoning and logic to: <ul style="list-style-type: none"> ○ Perceive patterns ○ Identify relationships ○ Formulate questions ○ Pose problems ○ Make conjectures ○ Justify strategies ○ Test reasonableness of results <p>A.4.2 Communicate mathematical ideas in a variety of ways, including words, numbers, symbols, pictures, charts, graphs, tables, diagrams, and models.</p> <ul style="list-style-type: none"> • Be more precise in verifying the correctness of a procedure using concrete models or symbolic methods. • Continue to communicate mathematical ideas in a variety of ways (<i>oral and written</i>) <table style="margin-left: 20px; border: none;"> <tr> <td style="padding: 0 10px;"><i>Numbers</i></td> <td style="padding: 0 10px;"><i>charts</i></td> <td style="padding: 0 10px;"><i>diagrams</i></td> </tr> <tr> <td style="padding: 0 10px;"><i>Symbols</i></td> <td style="padding: 0 10px;"><i>graphs</i></td> <td style="padding: 0 10px;"><i>models</i></td> </tr> <tr> <td style="padding: 0 10px;"><i>Pictures</i></td> <td style="padding: 0 10px;"><i>tables</i></td> <td style="padding: 0 10px;"><i>journals</i></td> </tr> </table> <p>A.4.3 Connect mathematical learning with other subjects, personal experiences, current events, and personal interests.</p> <ul style="list-style-type: none"> • Relate everyday language to mathematical language and symbols. • Use mathematics as a way to understand other curricular areas and the ever changing world. <p>A.4.4 Use appropriate mathematical vocabulary, symbols, and notation with understanding based on prior conceptual work.</p> <p>A.4.5 Explain solutions to problems clearly and logically in oral and written work and support solutions with evidence.</p> <ul style="list-style-type: none"> • Participate in and communicate own strategies for problem solving. 	<i>Numbers</i>	<i>charts</i>	<i>diagrams</i>	<i>Symbols</i>	<i>graphs</i>	<i>models</i>	<i>Pictures</i>	<i>tables</i>	<i>journals</i>	<p>A.5.1 Use reasoning abilities to:</p> <ul style="list-style-type: none"> • Use reasoning and logic to <ul style="list-style-type: none"> ○ Perceive patterns ○ Identify relationships ○ Formulate questions ○ Pose problems ○ Make conjectures ○ Justify strategies ○ Test reasonableness of results • Solve and analyze routine and non-routine problems. <p>A.5.2 Communicate mathematical ideas in a variety of ways, including words, numbers, symbols, pictures, charts, graphs, tables, diagrams, and models.</p> <ul style="list-style-type: none"> • Select, explain and defend two or more strategies to solve problems. <p>A.5.3 Connect mathematical learning with other subjects, personal experiences, current events, and personal interests.</p> <ul style="list-style-type: none"> • Connect mathematics to the real world, as well as within mathematics. <p>A.5.4 Use appropriate mathematical vocabulary, symbols, and notation with understanding based on prior conceptual work.</p> <ul style="list-style-type: none"> • Use appropriate mathematical language in communicating. <p>A.5.5 Explain solutions to problems clearly and logically in oral and written work and support solutions with evidence.</p> <ul style="list-style-type: none"> • Create and use representatives to organize, record and communicate mathematical ideas.
<i>Numbers</i>	<i>charts</i>	<i>diagrams</i>									
<i>Symbols</i>	<i>graphs</i>	<i>models</i>									
<i>Pictures</i>	<i>tables</i>	<i>journals</i>									

Wisconsin Standard B: NUMBER OPERATIONS AND RELATIONSHIPS

CONTENT STANDARD: Students in the School District of Superior will sensibly apply numbers in different situations such as counting, measuring, estimating, and problem solving.

By the end of grade FOUR, students will:

- B.4.1 Represent and explain whole numbers, decimals, and fractions with:**
- physical materials
 - number lines and other pictorial models
 - verbal descriptions
 - place-value concepts and notation
 - symbolic renaming (*e.g., $43=40+3=30+13$*)
- B.4.2 Determine the number of things in a set by:**
- grouping and counting (*e.g., by threes, fives, hundreds*)
 - combining and arranging (*e.g., all possible coin combinations amounting to thirty cents*)
 - estimation, including rounding
- B.4.3 Read, write, and order whole numbers, simple fractions (e.g., halves, fourths, tenths, unit fractions) and commonly-used decimals (monetary units).**
- B.4.4 Identify and represent equivalent fractions for halves, fourths, eighths, tenths, sixteenths.**
- B.4.5 In problem-solving situations involving whole numbers, select and efficiently use appropriate computational procedures such as:**
- recalling the basic facts of addition, subtraction, multiplication, and division
 - using mental math (*e.g., $37+25$, 40×7*)
 - estimation
 - selecting and applying algorithms for addition, subtraction, multiplication, and division
 - using a calculator
- B.4.6 Add and subtract fractions with like denominators.**
- B.4.7 In problem-solving situations involving money, add and subtract decimals.**

By the end of grade EIGHT, students will:

- B.8.1 Read, represent, and interpret various rational numbers (whole numbers, integers, decimals, fractions, and percents) with verbal descriptions, geometric models, and mathematical notation (e.g., expanded, scientific, exponential).**
- B.8.2 Perform and explain operations on rational numbers (add, subtract, multiply, divide, raise to a power, extract a root, take opposites and reciprocals, determine absolute value).**
- B.8.3 Generate and explain equivalencies among fractions, decimals, and percents.**
- B.8.4 Express order relationships among rational numbers using appropriate symbols ($>$, $<$, $)$.**
- B.8.5 Apply proportional thinking in a variety of problem situations that include, but are not limited to:**
- ratios and proportions (*e.g., rates, scale drawings, similarity*)
 - percents, including those greater than 100 and less than one (*e.g., discounts, rate of increase or decrease, sales tax*)
- B.8.6 Model and solve problems involving number-theory concepts such as:**
- prime and composite numbers
 - divisibility and remainders
 - greatest common factors
 - least common multiples
- B.8.7 In problem-solving situations, select and use appropriate computational procedures with rational numbers such as:**
- calculating mentally
 - estimating
 - creating, using, and explaining algorithms
 - using technology (*e.g., scientific calculators, spreadsheets*)

RATIONALE: People use numbers to quantify, describe, and label things in the world around them. It is important to know the many uses of numbers and various ways of representing them. Number sense is a matter of necessity, not only in one's occupation but also in the conduct of daily life, such as shopping, cooking, planning a budget, or analyzing information reported in the media. When computing, an educated person needs to know which operations (e.g., addition, multiplication), which procedures (e.g., mental techniques, algorithms), or which technological aids (e.g., calculator, spreadsheet) are appropriate.

School District of Superior STANDARD B: NUMBER OPERATIONS AND RELATIONSHIPS

Grade Level Performance Standards: *The student will...*

GRADE 3	GRADE 4	GRADE 5
<p>B.3.1 Represent and explain whole numbers, decimals, and fractions...</p> <ul style="list-style-type: none"> • Compare and order whole numbers less than 10,000. • Read, write, and represent numbers using words, numerals, pictures number lines, arrays, expanded form's (243=200 + 40 +3) and symbolic renaming ex. 243=250=7 • Further investigate whole numbers, fractions, and decimals. • Develop an understanding of whole numbers, fractions, and decimals. • Develop an understanding of the interpretation of pictorial representations (<i>graphs, charts, Venn diagrams</i>). • Identify a fractional part of a collection/set or parts of a whole. <p>B.3.2 Determine the number of things in a set...</p> <ul style="list-style-type: none"> • Count by 2's, 3's, 5's, 10's 25's and 100's starting with any multiple and 100's starting with any number. • Develop proficient/efficient strategies for counting on and counting back. • Demonstrate understanding of multiplication as grouping or repeated addition or arrays in problems with and without context (without context up to 5x9, in content products up to 100). • Demonstrate understanding of the concept of division as repeated subtraction, partitioning/sharing (dividend up to 45 and divisors up to 5) <p>B.3.3 Read, write, and order whole numbers, simple fractions (e.g., halves, fourths, tenths, unit fractions) and commonly-used decimals (monetary units).</p> <ul style="list-style-type: none"> • Develop an understanding of decimals related to monetary units. • Demonstrate an understanding of the comparison of whole numbers, decimals and simple fractions using (<, >, =,). • Read, write, order and represent unit fractions (1/2, 1/3, 1/4) and parts of a set. <p>B.3.4 Identify and represent equivalent fractions for halves, fourths, eighths, tenths, sixteenths.</p> <ul style="list-style-type: none"> • Explore equivalencies using concrete materials (<i>fraction bars, pattern blocks, etc.</i>) <p style="text-align: center; margin-top: 20px;"><i>(Continued on next page)</i></p>	<p>B.4.1 Represent and explain whole numbers, decimals, and fractions...</p> <ul style="list-style-type: none"> • Continue to develop an understanding of fractions, and decimals (<i>base ten blocks, multiplication tables, calculators, computers, money, arrays, hundreds chart pictorial representations, etc.</i>). • Exploring number lines (+ and -) • Introduce vocabulary as it relates to fractions (<i>numerator, denominator</i>). • Use oral and written communication to express the value of a number through the millions (<i>in these forms – standard, expanded and word name</i>). • Read, write and represent numbers using expanded forms. (243=200+40+3) • Investigate and construct a variety of ways to make a number using more complex operations (<i>ways to say 12 such as; 4x3 or 36 divided by 3 or 6x2, etc.</i>). • Develop an awareness of negative numbers in a real world setting. • Introduce appropriate symbolism for comparison (<, >.) <p>B.4.2 Determine the number of things in a set...</p> <ul style="list-style-type: none"> • Round whole numbers, decimals, and fractions in a meaningful context (shopping \$9.99 - \$10.00, cooking (<i>need 2c. flour – buy small bag</i>), distances (<i>7.84 mi. – 8 mi.</i>)). • Use basic facts to determine the first ten multiples of 2-10 and determine factors for numbers up to 100. <p>B.4.3 Read, write, and order whole numbers, simple fractions (e.g., halves, fourths, tenths, unit fractions) and commonly-used decimals (monetary units).</p> <ul style="list-style-type: none"> • Read, write, represent, count, compare and order, and make change using a collection of coins and bills equal to and less than \$20. • Read, write, order, and compare whole numbers through the millions. <p style="text-align: center; margin-top: 20px;"><i>(Continued on next page)</i></p>	<p>B5.1 Represent and explain whole numbers, decimals, and fractions...</p> <ul style="list-style-type: none"> • Read, write and represent numbers using words, numerals, pictures (base-ten blocks), number lines, arrays, expanded forms (12,436 = 10,000 + 2,000 + 400 +30 +6) and symbolic renaming e.g., 12,436 = 12,450 = 14. • Introduce and represent a number as a fraction, decimal, or percent (1/2 = .5 = .50 = 50%) • Recognize and apply place value concepts through 10,000,000 thousandths. • Introduce place value concepts through billions and thousandths. • Explore other number systems (<i>roman numerals</i>). <p>B.5.2 Determine the number of things in a set...</p> <ul style="list-style-type: none"> ▪ Identify and use number theory concepts. <ul style="list-style-type: none"> ○ Prime and composite numbers ○ Divisibility of potential numbers (divisors of 1-10, 25) ○ Least common multiple through 24 ○ Greats Common factors through 50 ▪ Efficiently recall multiplication facts, 0-12. <p>B.5.3 Read, write, and order whole numbers, simple fractions (e.g., halves, fourths, tenths, unit fractions) and commonly-used decimals (monetary units).</p> <ul style="list-style-type: none"> • Compare and order numbers less than 100,000 represented in numbers, arrays, symbols (<, >, =) and words. • Read, write and identify monetary amounts represented with visual models. • Compare and order monetary amounts <p>B.5.4 Identify and represent equivalence between fractions percents and decimals.</p> <ul style="list-style-type: none"> ▪ Read, write identify, order and compare mixed fractions. ▪ Represent fractions using numbers, pictures, and number lines. ▪ Rename improper fractions to mixed numbers in simplest form. ▪ Equate a monetary value with its benchmark fraction and percent (e.g., \$.25 = 1/4 - 25%) ▪ Demonstrate basic understanding of proportionality in proportional contexts.

B.3.5 In problem-solving situations involving whole numbers, select and efficiently use appropriate computational procedures.

- Use fractions to represent quantities when solving problems involving equal sharing or partitioning including fractions less than one as well as mixed numbers
 - Estimate sums to tens, hundreds and thousands and differences of ten and hundreds.
 - Use a calculator to justify solutions.
- Determine when estimation is an appropriate process in problem solving.
- Develop a proficiency in identifying, generating, and applying number relationships as a process of problem solving.
- Encourage the use of mental math.
- Introduce and develop strategies for recall of basic facts (+, -, x, simple division).
- Solve double and triple digit addition and subtraction problems with regrouping in horizontal and vertical format in problems with and without context.

B.3.6 Add and subtract fractions with like denominators.

- Introduce combining and subtracting fractions with like denominators.

B.3.7 In problem-solving situations involving money, add and subtract decimals.

- Use decimals to solve monetary problem situations.

B.4.4 Identify and represent equivalent fractions for halves, fourths, eighths, tenths, sixteenths.

- Represent fractions using numbers, pictures and number lines. Order and compare fractions represented numerically or as models.
- Rename improper fractions to mixed numbers.

B.4.5 In problem solving situations involving whole numbers, select and efficiently use appropriate computational procedures...

- Use all operations in everyday situations to solve single or multi-step word problems.
- Develop and refine strategies to recall the basic facts of addition, subtraction, multiplication and division.
- Develop an awareness of operational relationships (*addition to subtraction, addition to multiplication, subtraction to division, multiplication to division*).
- Solve three and four digit addition and subtraction with regrouping; multiplication of two digit by one-digit numbers; division with single-digit divisors and two digit dividends and with two-step or mixed operation problems with single-digit numbers.
- Use estimation to evaluate reasonableness of solutions.
- Continue to use and refine mental math.
- Select appropriate operations for solving problems.
- Use technology to solve problems.
- Refine recall of multiplication facts 0-12.

B.4.6 Add and subtract fractions with like denominators.

B.4.7 In problem-solving situations involving money, add and subtract decimals.

B.5.5 In problem-solving situations involving whole numbers, select and efficiently use appropriate computational procedures...

- Work with more complex money operations such as: discounts, sales tax, check books, interest rates, stock market, etc.
- Introduce percents including those greater than one hundred and less than one (*discounts, sales tax, interest rates*).
- Use all operations in everyday situations to solve single or multi-step word problems.
- Solve three and four digit addition and subtraction with regrouping, multiplication of three digits by 2-digit numbers, division with single-digit divisors and 4 digit dividends with 2 step or mixed operation problems.
- Use mental math
- Solve problems using basic multiplication and division facts.
- Estimate using basic whole number operations benchmark fractions and benchmark decimals.
- Determine reasonableness of answers.
- Use a calculator to justify solutions.

B.5.6 Add and subtract fractions with like denominators

- Add and subtract fractions with like and unlike denominators (halves, thirds, fourths, fifths, and tenths) with sums or differences between 0 and 1.

B.5.7 In problem-solving situations involving money, add and subtract decimals.

- Compute decimals in the context of money and make change.

Wisconsin Standard C: GEOMETRY

CONTENT STANDARD: Students in the School District of Superior will be able to use geometric concepts, relationships and procedures to interpret, represent, and solve problems.

By the end of grade FOUR, students will:

C.4.1 Describe two- and three-dimensional figures (e.g., circles, polygons, trapezoids, prisms, spheres) by:

- Naming them
- Comparing, sorting, and classifying them
- Drawing and constructing physical models to specifications
- Identifying their properties (e.g., number of sides or faces, two- or three dimensionality, equal sides, number of right angles)
- Predicting the results of combining or subdividing two-dimensional figures.
- Explaining how these figures are related to objects in the environment.

C.4.2 Use physical materials and motion geometry (such as slides, flips, and turns) to identify properties and relationships, including but not limited to:

- Symmetry
- Congruence
- Similarity

C.4.3 Identify and use relationship among figures, including but not limited to:

- location (e.g., between, adjacent to, interior of)
- position (e.g., parallel, perpendicular)
- intersection (of two-dimensional figures)

C.4.4 Use simple two-dimensional coordinate systems to find locations on maps and to represent points and simple figures.

By the end of grade EIGHT, students will:

C.8.1 Describe special and complex two- and three-dimensional figures (e.g., rhombus, polyhedron, cylinder) and their component parts (e.g., base, altitude, and slant height) by:

- Naming, defining, and giving examples
- Comparing, sorting, and classifying them
- Identifying and contrasting their properties (e.g., symmetrical, isosceles, regular)
- Drawing and constructing physical models to specifications
- Explaining how these figures are related to objects in the environment.

C.8.2 Identify and use relationship among the component parts of special and complex two- and three-dimensional figures (e.g., parallel sides, congruent faces).

C.8.3 Identify three-dimensional shapes from two-dimensional perspectives and draw two-dimensional sketches of three-dimensional objects preserving their significant features.

C.8.4 Perform transformations on two-dimensional figures and describe and analyze the effects of the transformations on the figures.

C.8.5 Locate objects using the rectangular coordinate system.

RATIONALE: Geometry and its study of shapes and relationships is an effort to understand the nature and beauty of the world. While the need to understand our environment is still with us, the rapid advance of technology has created another need: to understand ideas communicated visually through electronic media. For these reasons, educated people in the 21st Century need a well-developed sense of spatial order to visualize and model real world problem situations.

School District of Superior STANDARD C: GEOMETRY

Grade Level Performance Standards: *The student will...*

GRADE 3	GRADE 4	GRADE 5
<p>C.3.1 Describe two- and three-dimensional figures (e.g., circles, polygons, trapezoids, prisms, spheres)...</p> <ul style="list-style-type: none"> • Identify, describe and compare properties of 2 and 3 dimensional figures such as squares, triangles, rectangles, pentagon, hexagon, octagon, pattern block shapes, circles, cubes, pyramids, rectangular, prisms, cylinders and spheres (ex. Comparing sides, faces corners, and edges) • Create and identify 2 dimensional geometric shapes by combining or decomposing other shapes. • Identify cubes and square pyramid shapes from their nets (flat patterns) <p>C.3.2 Use physical materials and motion geometry (such as slides, flips, and turns) to identify properties and relationships...</p> <ul style="list-style-type: none"> • Continue to explore symmetry (relationship of parts as in size, arrangement, or measurement). • Apply concepts of single motion geometry (ex slides flips, and turns) to match two identical shapes. <p>C.3.3 Identify and use relationships among figures...</p> <ul style="list-style-type: none"> • Begin to use positional vocabulary to locate and describe objects in terms of their position (parallel, perpendicular, between, etc.) <p>C.3.4 Use simple two-dimensional coordinate systems to find locations on maps and to represent points and simple figures. Use simple 2 dimensional coordinate systems to find locations on maps and to represent points and simple figure with coordinates using letters and numbers (ex. (E, 3))</p>	<p>C.4.1 Describe two- and three dimensional figures (e.g., circles, polygons, trapezoids, prisms, spheres)...</p> <ul style="list-style-type: none"> • Identify, describe, and compare properties of 2 and 3 dimensional figures, comparing sides, faces, vertices and edges of regular figures including parallel and perpendicular lines and line segments. • Explain how those figures are related to objects in the environment. • Draw lines, line segments, rays, angles, and 2 dimensional shapes. <p>C.4.2 Use physical materials and motion geometry (such as slides, flips, and turns) to identify properties and relationships...</p> <ul style="list-style-type: none"> • Use slides, flips and turns on 2 & 3 dimensional figures. Identify congruent shapes using figures that have been manipulated by one or two motions. • Identify cubes, rectangular and triangular prisms and rectangular and triangular pyramids. <p>C.4.3 Identify and use relationships among figures...</p> <ul style="list-style-type: none"> • Identify use relationship and vocabulary among figures. <ul style="list-style-type: none"> ○ Location (adjacent to, interior of) ○ Position (parallel, perpendicular) ○ Intersection (of two dimensional shapes) <p>C.4.4 Use simple two-dimensional coordinate systems to find locations on maps and to represent points and simple figures.</p>	<p>C.5.1 Describe two- and three-dimensional figures (e.g., circles, polygons, trapezoids, prisms, spheres)...</p> <ul style="list-style-type: none"> • Introduce terms of reflection, rotation, translation. • Practice with shape properties and shape relationships that involve problem solving (room arrangement, origami, cake decoration). • Recognize and name polygons with 3, 4, 5, 6, or 8 sides. • Identify and describe 3 dimensional figures from multiple perspectives. • Compare, sort, and classify 2-D and 3-D figures based on properties. • Use materials (e.g., tangrams, power polygons, tessellation shapes and protractors) to describe model and construct plane figures. • Identify properties of 2-D and 3-D figures (acute, obtuse, and right, scalene, isosceles, equilateral, regular, irregular, symmetry, parallel, perpendicular, rays, base, line segment, line, vertex, face sides.) • Predict the result of combining and dividing 2-D figures using materials (e.g., power polygons) • Explain how these figures are related to objects in the environment. <p>C.5.2 Use physical materials and motion geometry (such as slides, flips, and turns) to identify properties and relationships...</p> <ul style="list-style-type: none"> ▪ Introduce terms of reflection, rotation, translation ▪ Identify lines of symmetry and the number of lines of symmetry in figures. ▪ Identify figures that are congruent and/or similar.. ▪ Uses slides, flips, and turns on figures. ▪ Identify congruent shapes using figures that have been manipulated by one or two motions. <p>C.5.3 Identify and use relationships among figures...</p> <ul style="list-style-type: none"> ▪ Draw a diagram/picture of a simple three-dimensional model, showing various views (top, side, base, left side, right side and face). ▪ Recognize relationships among 2-D/3-D figures based on location (e.g., between, adjacent to, interior of) ▪ Recognize relationship among 2-D/3-D figures based on position (e.g., parallel, perpendicular) ▪ Describe and compare cubes, rectangular, and triangular prisms and rectangular and triangular

		<p>pyramids from nets (flat patterns)</p> <ul style="list-style-type: none">▪ Build a simple 3-D model from 2-D diagram or directives. <p>C.5.4 Use simple two-dimensional coordinate systems to find locations on maps and to represent points and simple figures.</p> <ul style="list-style-type: none">• Identify and plot the coordinates of locations or objects on simple one quadrant grids using numbers only for coordinates (e.g., (3, 2)).• Locate the fourth coordinate pair when given three vertices of a rectangle or parallelogram on a coordinate grid.
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Wisconsin Standard D: MEASUREMENT

CONTENT STANDARD: Students in the School District of Superior will select and use appropriate tools (including technology) and techniques to measure things to a specified degree of accuracy. They will use measurements in problem solving situations.

By the end of grade FOUR, students will:

- D.4.1 **Recognize and describe measurable attributes, such as length, liquid capacity, time, weight (mass), temperature, volume, monetary value, and angle size, and identify the appropriate units to measure them.**
- D.4.2 **Demonstrate understanding of basic facts, principles, and techniques of measurement, including:**
- Appropriate use of arbitrary and standard units (metric and US Customary)
 - Appropriate use of conversion of units within a system (such as yards, feet, and inches; kilograms and grams; gallons, quarts, pints, and cups)
 - Judging the reasonableness of an obtained measurement as it relates to prior experience and familiar benchmarks
- D.4.3 **Read and interpret measuring instruments (e.g., rulers, clocks, thermometers).**
- D.4.4 **Determine measurements directly by using standard tools to these suggested degrees of accuracy:**
- Length to the nearest half-inch or nearest cm
 - Weight (mass) to the nearest ounce or nearest 5 grams
 - Temperature to the nearest 5
 - Time to the nearest minute
 - Monetary value to dollars and cents
 - Liquid capacity to the nearest fluid ounce
- D.4.5 **Demonstrate measurements by using basic relationships (such as perimeter and area) and approximate measurements by using estimation techniques.**

By the end of grade EIGHT, students will:

- D.8.1 **Identify and describe attributes in situations where they are not directly or easily measurable (e.g., distance, area of an irregular figure, likelihood of occurrence).**
- D.8.2 **Demonstrate understanding of basic measurement facts, principles, and techniques including the following:**
- Approximate comparisons between metric and US Customary units (e.g., a liter and a quart are about the same; a kilometer is about six-tenths of a mile)
 - Knowledge that direct measurement produces approximate, not exact, measures
 - The use of smaller units to produce more precise measures
- D.8.3 **Determine measurement directly using standard units (metric and US Customary) with these suggested degrees of accuracy:**
- Lengths to the nearest mm or 1/16 of an inch
 - Weight (mass) to the nearest 0.1g or 0.5 ounce
 - Liquid capacity to the nearest ml
 - Angles to the nearest degree
 - Temperature to the nearest C or F
 - Elapsed time to the nearest second
- D.8.4 **Determine measurements indirectly using:**
- Estimation
 - Conversion of units within a system (e.g., quarts to cups, millimeters to centimeters)
 - Ratio and proportion (e.g., similarity, scale drawings)
 - Geometric formulas to derive lengths, areas, volumes of common figures (e.g., perimeter, circumference, surface area)
 - The Pythagorean relationship
 - Geometric relationships and properties for angle size (e.g., parallel lines and transversals; sum of angles of a triangle; vertical angles)

RATIONALE: Measurement is the foundation upon which much technological, scientific, economic, and social inquiry rests. Before things can be analyzed and subjected to scientific investigation or mathematical modeling, they must first be quantified by appropriate measurement principles. Measurable attributes include such diverse concepts as voting preferences, consumer prices indices, speed and acceleration, length, monetary value, duration of an Olympic race, or probability of contracting a fatal disease

School District of Superior STANDARD D: MEASUREMENT

Grade Level Performance Standards: *The student will...*

GRADE 3	GRADE 4	GRADE 5
<p>D.3.1 Recognize and describe measurable attributes, such as length, liquid capacity, time, weight (mass), temperature, volume, monetary value, and angle size, and identify the appropriate units to measure them.</p> <ul style="list-style-type: none"> • Describe attributes of length, time, temperature, liquid capacity, weight/mass, volume and identify appropriate units to measure them. Units include: inches, feet, yards, miles, meters, centimeters, millimeters, cups, quarts, gallons, liters, (seconds, minutes, hours, days, months, years), ounces, pounds, grams, and <u>degrees Fahrenheit/Celsius</u> • Compare attributes of length, volume and weight by observation or when given actual measurements <p>D.3.2 Demonstrate understanding of basic facts, principles, and techniques of measurement...</p> <ul style="list-style-type: none"> • Make measurement conversions within a system (ex. Yards to feet; feet to inches; hours to minutes; days to hours; years to months; gallons to quarts) <p>D.3.3 Read and interpret measuring instruments (e.g., rulers, clocks, thermometers).</p> <p>D.3.4 Determine measurements directly by using standard tools to these suggested degrees of accuracy.</p> <ul style="list-style-type: none"> • Develop accuracy using standard tools: <ul style="list-style-type: none"> ○ Weight to the nearest ounce or pound ○ Weight to the nearest 5 grams ○ Money: count, compare and make change up to \$10.00 using a collection of coins and one-dollar bills. • Read, interpret and use measuring instruments to determine the measurement of objects with non-standard and standard units <ul style="list-style-type: none"> ○ Length to the nearest centimeter or ¼ inch ○ Read thermometers to the nearest 5 degrees Fahrenheit/Celsius ○ Tell time to the nearest minute and translate time from analog to digital clocks and vice versa ○ Determine and compare elapsed time in multiples of 15 minutes in problem-solving situations • Investigate measurements of area and perimeter <p style="text-align: center;"><i>(Continued on next page)</i></p>	<p>D.4.1 Recognize and describe measurable attributes, such as length, liquid capacity, time, weight (mass), temperature, volume, monetary value, and angle size, and identify the appropriate units to measure them.</p> <ul style="list-style-type: none"> • Compare attributes of length and weight by direct observation or when given actual measurement. <p>D.4.2 Demonstrate understanding of basic facts, principles, and techniques of measurement...</p> <ul style="list-style-type: none"> • Begin to demonstrate an understanding of relationships between units within a system. (<i>Yd. to ft., gram to kg., in. to ft., etc...</i>) • Estimate measurement using U.S. customary & metric measurements. <p>D.4.3 Read and interpret measuring instruments (e.g., rulers, clocks, thermometers).</p> <ul style="list-style-type: none"> • Translate time on an analog clock to a digital clock and vice versa. • Determine and compare elapsed time in problem-solving situations. <p>D.4.4 Determine measurements directly by using standard tools to these suggested degrees of accuracy.</p> <ul style="list-style-type: none"> • Use standard and non-standard measurement to estimate and judge reasonableness. • Determine and measure: <ul style="list-style-type: none"> ○ Length to the nearest ¼ inch or nearest cm. ○ Weight (mass) to the nearest ounce or gram ○ Temperature to the nearest 1degree C or F ○ Time to the nearest minute ○ Elapsed time to the nearest minute ○ Money (dollars and cents) ○ Liquid capacity to the nearest fluid ounce, ml. or cc. <p>D.4.5 Determine measurements by using basic relationships (such as perimeter and area) and approximate measurements by using estimation techniques.</p> <ul style="list-style-type: none"> • Determine perimeter and area of regular shapes, including plane rectangular shapes. 	<p>D.5.1 Recognize and describe measurable attributes, such as length, liquid capacity, time, weight (mass), temperature, volume, monetary value, and angle size, and identify the appropriate units to measure them.</p> <ul style="list-style-type: none"> ▪ Identify appropriate unite to measure length, liquid capacity, volume, time, weight/mass, temperature, including mixed measures. Units include inches, feet, yards (i.e. 1 foot 3 inches) miles centimeters, millimeters, meters, kilometers, ounces, cups, quarts, gallons, liters, hours, minutes, seconds (i.e., 1 hour 15 minutes), days, months, years, pounds, grams, ounces, kilograms, and degrees Fahrenheit/Ceclius ▪ Compare attributes of length, volume, and weight by observation or when given actual measurements. <p>D.5.2 Demonstrate understanding of basic facts, principles, and techniques of measurement...</p> <ul style="list-style-type: none"> • Convert basic units within a system. (<i>cups to quarts, mm to cm</i>). • Make approximate comparisons between metric and U.S. Customary units (<i>a liter and a quart are about the same, a kilometer is about ½ mile</i>). <p>D.5.3 Read and interpret measuring instruments (e.g., rulers, clocks, thermometers).</p> <ul style="list-style-type: none"> • Use direct measurement to estimate and/or solve problems. • Explore more precise measurement in real world (authentic) activities. • Apply the process of measurement (<i>use of scales, rulers, protractors, thermometers, and compass</i>). • Select appropriate tools and units in a given situation. • Determine lengths to within 5mm or 1/8 inch. • Determine weight (mass) to the nearest ounce or gram. • Determine liquid capacity to the nearest milliliter or ounce. • Determine angles within a reasonable degree to accuracy. • Determine temperature to nearest C or F • Determine elapsed time to the nearest second. <p>D.5.4 Determine measurements directly by using standard tools to these suggested degrees of accuracy.</p> <ul style="list-style-type: none"> • Determine lengths to within 5mm or 1/8 inch. • Determine weight (mass) to the nearest ounce or gram. • Determine liquid capacity to the nearest milliliter or ounce. • Determine angles within a reasonable degree to accuracy. • Determine temperature to nearest C or F

- D.3.5 Determine Measurements by using basic relationships (such as perimeter and area) and approximate measurements by using estimation techniques.**
- Apply estimation techniques using non-standard units

- Determine elapsed time to the nearest second.
- Measure length to the nearest 1/8 inch, centimeter or millimeter.
- Measure weight (mass) to the nearest ounce or gram
- Measure liquid capacity to the nearest milliliter or ounce.
- Determine angle measurement to nearest five degrees using a protractor
- Measure temperature to the nearest degree Fahrenheit / Celsius
- Determine and compare elapsed time in problem-solving.

- D.5.5 Determine measurements by using basic relationships (such as perimeter and area) and approximate measurements by using estimation techniques.**
- Determine the area of regular shapes included right triangles, squares and rectangles.
 - Determine the perimeter of complex shapes
 - Determine volume of basic shapes rectangular prisms
 - Determine distance between points on a map using a scale.
 - Introduce relationships and properties of angles (e.g., angles of a triangle = 180, right angle = 90)
 - Estimate measurements using US customary and metric measurements

Wisconsin Standard E: STATISTICS AND PROBABILITY

CONTENT STANDARD: Students in the School District of Superior will use data collection and analysis, statistics and probability in problem solving situations, employing technology where appropriate.

By the end of grade FOUR, students will:

- E.4.1 **Work with data in the context of real-world situations by:**
- Formulating questions that lead to data collection and analysis
 - Determining what data to collect and when and how to collect them
 - Collecting, organizing, and displaying data
 - Drawing reasonable conclusions based on data
- E.4.2 **Describe a set of data using:**
- High and low values, and range
 - Most frequent value (mode)
 - Middle value of a set of ordered data (median)
- E.4.3 **In problem-solving situations, read, extract, and use information presented in graphs, tables or charts.**
- E.4.4 **Determine if future events are more, less, or equally likely, impossible, or certain to occur.**
- E.4.5 **Predict outcomes of future events and test predictions, using data from a variety of sources.**

RATIONALE: Dramatic advances in technology have launched the world into the Information Age, when data are used to describe past events or predict future events. Whether in the business place or in the home, as producers or consumers of information, citizens need to be well versed in the concepts and procedures of data analysis in order to make informed decisions.

By the end of grade EIGHT, students will:

- E.8.1 **Work with data in the context of real-world situations by:**
- Formulating questions that lead to data collection and analysis
 - Designing and conducting a statistical investigation
 - Using technology to generate displays, summary statistics, and presentations
- E.8.2 **Organize and display data from statistical investigations using:**
- Appropriate tables, graphs, and/or charts (e.g., circle, bar or line for multiple sets of data).
 - Appropriate plots (e.g., line, stem-and-leaf, box, scatter)
- E.8.3 **Extract, interpret, and analyze information from organized and displayed data by using:**
- Frequency and distribution, including mode and range
 - Central tendencies of data (mean and median)
 - Indicators of dispersion (e.g., outliers)
- E.8.4 **Use the results of data analysis to:**
- Make predictions
 - Develop convincing arguments
 - Draw conclusions
- E.8.5 **Compare several sets of data to generate, test, and, as the data dictate, confirm or deny hypotheses.**
- E.8.6 **Evaluate presentations and statistical analysis from a variety of sources for:**
- Credibility of the source
 - Techniques of collection, organization, and presentation of data
 - Missing or incorrect data
 - Inferences
 - Possible sources of bias
- E.8.7 **Determine the likelihood of occurrence of simple events by:**
- Using a variety of strategies to identify possible outcomes (e.g., lists, tables, tree diagrams)
 - Conducting an experiment
 - Designing and conducting simulations
 - Applying theoretical notions of probability (e.g., that four equally likely events have a 25% chance of happening)

School District of Superior STANDARD E: STATISTICS AND PROBABILITY

Grade Level Performance Standards: *The student will...*

GRADE 3	GRADE 4	GRADE 5
<p>E.3.1 Work with data in the context of real-world situations...</p> <ul style="list-style-type: none"> • Answer and pose questions about collecting, organizing, and displaying data • Work with data in the context of real world situations by formulating questions that lead to data collection • Determine what data to collect and when and how to collect the data • Collect, organize and display data in simple bar graphs and charts including translating data from one form to the other <p>E.3.2 Describe a set of data...</p> <ul style="list-style-type: none"> • Introduce terminology of range, median, and mode and begin to understand their relationship to data. • Explore averages. <p>E.3.3 In problem-solving situations, read, extract, and use information presented in graphs, tables, or charts.</p> <ul style="list-style-type: none"> • Read, use information and draw reasonable conclusions from data in graphs, tables, charts and Venn diagrams <p>E.3.4 Determine if future events are more, less, or equally likely, impossible, or certain to occur.</p> <ul style="list-style-type: none"> • Investigate strategy vs. chance (coin flipping, checkers, rolling cube). • Predict the outcomes of a simple event using words to describe probability (random, chance, odds) <p>E.3.5 Predict outcomes of future events and test predictions using data from a variety of sources.</p> <ul style="list-style-type: none"> • Use data to predict outcomes and begin to test those predictions. • Design a fair and an unfair spinner • Describe and determine the number of combinations for choosing 2 out of 3 items (Ex: red hat, blue jacket and green jacket. What are the combinations of wearing a hat and a jacket?) 	<p>E.4.1 Work with data in the context of real-world situations...</p> <ul style="list-style-type: none"> • Formulate a plan with appropriate question that lead to data collection and analysis. • Interpret, identify and draw reasonable conclusions based on the data. • Use data to predict outcomes or trends from graph or tables. <p>E.4.2 Describe a set of data...</p> <ul style="list-style-type: none"> • Introduce average (mean) and explore its application. • Use appropriate language in written and oral communications (data, sample, average/mean, range, median, and mode). <p>E.4.3 In problem-solving situations, read, extract, and use information presented in graphs, tables, or charts.</p> <ul style="list-style-type: none"> • Construct tables and charts. • Construct representation of data (graphs – line, bar, pie, picture graph, line plots, and Venn Diagrams). • Develop the use of range, median, and mode in problem solving. Limited to 7 or less numbers. <p>E.4.4 Determine if future events are more, less, or equally likely, impossible, or certain to occur.</p> <ul style="list-style-type: none"> • Continue to develop language of probability (bias, random, change odds) • Continue to make models depicting different outcomes. <p>E.4.5 Predict outcomes of future events and test predictions using data from a variety of sources.</p> <ul style="list-style-type: none"> • Predict the outcomes of a single event using words to describe probability and test predictions using data from a variety of sources (e.g., dice, spinners, coins, games and simulation.) • Choose or design an event that is fair or unfair. 	<p>E.5.1 Work with data in the context of real-world situations...</p> <ul style="list-style-type: none"> • Formulate questions that lead to data collection and analysis. • Collect data: determine who/where to ask; when enough information has been collected; investigate sample size; investigate sampling of different populations – gathering surveys, research, observation, interviews, experiments. • Use probability for decision making in real life situations (health risks related to life-style choices, carnival games, stock market games, etc.). • Formulate questions to collect, organize, and display data • Collect organize and display data in appropriate graphs & charts (using technology if appropriate) • Draw reasonable conclusions based on contextual data • Use data to predict outcomes or trends from graphs and tables. <p>E.5.2 Describe a set of data...</p> <ul style="list-style-type: none"> • List/categorize results. • Describe/represent data in appropriate ways (same data/different ways, different data/same way, graphs, charts, tables, diagrams, average/mean, median, mode range). • Organize/diagram data from probability experiments. • Describe a given set of data of ten or fewer times/numbers using the terms mean, median, mode, and range to extract information from organized charts, tables, graphs, and Venn diagrams in problems with or without context <p>E.5.3 In problem-solving situations, read, extract, and use information presented in graphs, tables, or charts.</p> <ul style="list-style-type: none"> • Extract, interpret and analyze data from single bar graphs, tables and charts, line plots, context, circle graphs and Venn diagrams • Use results of data to make decision and develop convincing arguments.

(Continued on next page)

		<p>E.5.4 Determine if future events are more, less, or equally likely, impossible, or certain to occur.</p> <ul style="list-style-type: none"> ▪ Use language of probability: possible, impossible, certain, choice, chance, data, odds, random, bias <p>E.5.5 Predict outcomes of future events and test predictions using data from a variety of sources.</p> <ul style="list-style-type: none"> • Choose an event that is fair or unfair. <p>E.5.6 Evaluate presentations and statistical analysis from a variety of sources...</p> <ul style="list-style-type: none"> • Discuss credibility of the source/bias. <p>E.5.7 Determine the likelihood of occurrence of simple events...</p> <ul style="list-style-type: none"> • Determine probability of events in context using words percents, and fractions. • Describe and determine the number of combinations of searching 3 items from 4 or more items.
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Wisconsin Standard F: ALGEBRAIC RELATIONSHIPS

CONTENT STANDARD: Students in the School District of Superior will discover, describe, and generalize simple and complex patterns and relationships. In the context of real-world problem situations, the student will use algebraic techniques to define and describe the problem and to determine and justify appropriate solutions.

By the end of grade FOUR, students will:

- F.4.1 Use letters, boxes, or other symbols to stand for any number, measured quantity, or object in simple situations (e.g., $N+0 = N$ is true for any number).
- F.4.2 Use the vocabulary, symbols, and notation of algebra accurately (e.g., correct use of the symbol “=”); effective use of the associative property of multiplication).
- F.4.3 Work with simple linear patterns and relationships in a variety of ways, including:
- Recognizing and extending number patterns
 - Describing them verbally
 - Representing them with pictures, tables, charts, graphs
 - Recognizing that different models can represent the same pattern or relationship
 - Using them to describe real-world phenomena
- F.4.4 Recognize variability in simple functional relationships by describing how a change in one quantity can produce a change in another (e.g., number of bicycles and the total number of F.8.3 wheels).
- F.4.5 Use simple equations and inequalities in a variety of ways, including:
- Using them to represent problem situations
 - Solving them by different methods (e.g., use of manipulative, guess and check strategies, recall of number facts)
 - Recording and describing solution strategies
- F.4.6 Recognize and use generalized properties and relationships of arithmetic (e.g., commutativity of addition, inverse relationship of multiplication and division).

By the end of grade EIGHT, students will:

- F.8.1 Work with algebraic expressions in a variety of ways, including:
- Using appropriate symbolism, including exponents and variables
 - Evaluating expressions through numerical substitution
 - Generating equivalent expressions
 - Adding and subtracting expressions
- F.8.2 Work with linear and nonlinear patterns and relationships in a variety of ways, including:
- Representing them with tables, with graphs, and with algebraic expressions, equations, and inequalities.
 - Describing and interpreting their graphical representations (e.g., slope, rate of change, intercepts)
 - Using them as models of real-world phenomena
 - Describing a real-world phenomenon that a given graph might represent
- F.8.3 Recognize, describe, and analyze functional relationships* by generalizing a rule that characterizes the pattern of change among variables. These functional relationships include exponential growth and decay (e.g., cell division, depreciation).
- F.8.4 Use linear equations and inequalities in a variety of ways, including:
- Writing them to represent problem situations and to express generalizations
 - Solving them by different methods (e.g., informally, graphically, with formal properties, with technology)
 - Writing and evaluating formulas (including solving for a specified variable)
 - Using them to record and describe solution strategies
- F.8.5 Recognize and use generalized properties and relations, including:
- Additive and multiplicative property of equations and inequalities
 - Commutativity and associativity of addition and multiplication
 - Distributive property
 - Inverses and identifies for addition and multiplication
 - Transitive property

RATIONALE: Algebra is the language of mathematics. Much of the observable world can be characterized as having patterned regularity where a change in one quantity results in changes in other quantities. Through algebra and the use of variables and functions, mathematical models can be built which are essential to personal, scientific, economic, social, medical, artistic, and civic fields of inquiry.

School District of Superior STANDARD F: ALGEBRAIC RELATIONSHIPS

Grade Level Performance Standards: *The student will...*

GRADE 3	GRADE 4	GRADE 5
<p>F.3.1 Use letters, boxes, or other symbols to stand for any number, measured quantity, or object in simple situations (e.g., $N+O=N$ is true for any number).</p> <ul style="list-style-type: none"> • Use notation to represent mathematical thinking: letter or box (variable); operation symbols (+, -, =) <p>F.3.2 Use the vocabulary, symbols, and notation of algebra accurately (e.g., correct use of the symbol “=”; effective use of the associative property of multiplication).</p> <ul style="list-style-type: none"> • Introduce vocabulary <ul style="list-style-type: none"> ○ Unknown ○ Variables ○ Equations • Demonstrate an understanding that the “=” sign means “the same as” by solving open or true/false number sentences • Demonstrate a basic understanding of equality and inequality using symbols (<, >, =) with simple addition and subtraction • Use properties and relationships of arithmetic to determine what number goes in a box to make a number sentence true <ul style="list-style-type: none"> ○ Identify property of zero (Ex: $12 + 0 =$ “box”) ○ Identify property of one (Ex: $5 \times 1 =$ “box”) ○ Commutative property for addition of single-digits (Ex: $3 + 7 = 7 + 3$) ○ Associative property (Ex. $(3+7)+2=3+(7+2)$) <p>F.3.3 Work with simple linear patterns and relationships in a variety of ways...</p> <ul style="list-style-type: none"> • Recognize, extend, describe, create and replicate a variety of patterns, including, attribute, number and geometric patterns (Ex: picture patterns, patterns in tables and charts, “what’s my rule?” patterns, patterns using addition and subtraction rules • Determine odd and/or even <p>F.3.4 Recognize variability in simple functional relationships by describing how a change in one quantity can produce a change in another (e.g., number of bicycles and the total number of wheels).</p> <ul style="list-style-type: none"> • Describe how a change in one quantity can produce a change in another. <p>F.3.5 Use simple equations and inequalities in a variety of ways.</p>	<p>F.4.1 Use letters, boxes, or other symbols to stand for any number, measured quantity, or object in simple situations (e.g., $N+O = N$ is true for any number).</p> <ul style="list-style-type: none"> • Solve simple one-step open sentences including missing factor in problems with or without context (e.g., “box” or letter variable and whole number coefficients.) • Explore the use of variables in simple expressions. $a + 3, a = 5, 5 + 3$ • Begin to recognize and represent a simple functional relationship within existing patterns, ($n + 8 = x$ $n=\{1,2,3,4\}$). <p>F.4.2 Use the vocabulary, symbols, and notation of algebra accurately (e.g., correct use of the symbol “=”; effective use of the associative property of multiplication).</p> <ul style="list-style-type: none"> • Demonstrate a basic understanding of equality and inequality using symbols (>, <, =) with all operations. • Introduce and use alternative symbols for multiplication. $4 (3), 4 \cdot 3, 4 \times 3$ • Be introduced to the associative and distributive property of multiplication. • Develop use of different functions within a single equation, $4 (3+5)$. • Explore order of operations. <p>F.4.3 Work with simple linear patterns and relationships in a variety of ways...</p> <ul style="list-style-type: none"> • Recognize, extend, describe, create and replicate a variety of patterns including attribute, numeric, and geometric patterns. • Represent patterns and relationships with pictures, tables and charts. • Determine a future event up to the eighth item when given the first five. <p>F.4.4 Recognize variability in simple functional relationships by describing how a change in one quantity can produce a change in another (e.g., number of bicycles and the total number of wheels).</p> <ul style="list-style-type: none"> • Describe a rule that explains a functional relationship or pattern using addition, subtraction or multiplication rules. <p>F.4.5 Use simple equations and inequalities in a variety of ways...</p> <ul style="list-style-type: none"> • Represent problem situations with one-step equations involving multiplication and division with simple open 	<p>F.5.1 Use letters, boxes, or other symbols to stand for any number, measured quantity, or object in simple situations (e.g., $N + 0 = N$ is true for any number).</p> <ul style="list-style-type: none"> ▪ Solve one-step equations with “box” variable and whole number coefficient in problems with and without context using whole number coefficients. ▪ Solve two-step multi-operation equations with “box” or letter variable and whole number coefficients with and without context ▪ Solve two-step open sentences involving all operations. ▪ Solve equations involving any two operations <p>F.5.2 Use the vocabulary, symbols, and notation of algebra accurately (e.g., correct use of the symbol “=”; effective use of the associative property of multiplication).</p> <ul style="list-style-type: none"> ▪ Demonstrate basic understanding of equality and inequality using symbols (<, >, =) with multi-step mixed operations. ▪ Use alternative symbols for multiplication and division. <p>F.5.3 Work with simple linear patterns and relationships in a variety of ways...</p> <ul style="list-style-type: none"> ▪ Recognize, extend, describe create and replicate a variety of patterns including attribute, numeric and geometric patterns. ▪ Represent patterns and relationships with pictures, tables and charts. ▪ Determine a future event in a pattern up to the tenth item when given the first five. ▪ Solve simple two-step, two operation patterns (ex: 5, 8, 6, 9, 7, 10, 8...pattern: $+3 - 2$) ▪ Represent patterns with pictures, tables and charts <p>F.5.4 Recognize variability in simple functional relationships by describing how a change in one quantity can produce a change in another (e.g., number of bicycles and the total number of wheels).</p> <ul style="list-style-type: none"> ▪ Describe a rule that explains a functional relationship or pattern using addition, subtraction or multiplication rules. <p>F.5.5 Use simple equations and inequalities in a variety of ways...</p> <ul style="list-style-type: none"> • Represent problem situations with one or two –step equation or expressions. Solve simple two-step two

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F.3.6 Recognize and use generalized properties and relationships of arithmetic (e.g., commutativity of addition, inverse relationship of multiplication and division).

- Continue to develop and solve two-step problems.
- Be introduced to order of operations.

$$\begin{array}{ll} (4+3) - (2+1) = 4 & (4+3)-2+1 = 6 \\ 7-3 = 4 & 7-2+1 = 6 \\ 4+(3-2)+1 = 6 & 4+3-(2+1) = 4 \\ 4+1+1 = 6 & 4+3-3 = 4 \end{array}$$

- Understand relationships of numbers through fact families.

$$\begin{array}{lll} 2 \times 3 = 6 & 2 = 6 \div 3 & 2 + 3 = 5 \\ 3 \times 2 = 6 & 3 = 6 \div 2 & 3 + 2 = 5 \\ 6 \div 2 = 3 & 6 = 2 \times 3 \text{ etc.} & 5 - 3 = 2 \\ 6 \div 3 = 2 & & 5 - 2 = 3 \end{array}$$

sentences.

- Represent problem situations with one-step equations or expressions using one of the four operations.
- Begin to generate a rule to describe a constant relationship (using tables, manipulatives, relationship situations, etc.)
 $a + 5, n \times 3.$

F.4.6 Recognize and use generalized properties and relationships of arithmetic (e.g., commutativity of addition, inverse relationship of multiplication and division).

- Recognize the relationship of zero in multiplication and division.
- Use the commutative property of multiplication with positive single digits.
- Use the inverse relationship of division and multiplication with single digit, whole numbers.
- Demonstrate understanding of order of operations by solving two-step open sentences involving all operations.

operation patterns.

F.5.6 Recognize and use generalized properties and relationships of arithmetic (e.g., commutativity of addition, inverse relationship of multiplication and division).

- Use the commutative property of multiplication with positive single digits.
- Use the inverse relationship of division and multiplication with single whole digits.
- Simplify (evaluate) two-step numerical expressions using correct order of operations.
- Demonstrate understanding of distributive property
- Demonstrate understanding of order of operations by solving two-step open sentences involving all operations.