

Number and Number Sense

- K.1 The student, given two sets, each containing 10 or fewer concrete objects, will identify and describe one set as having more, fewer, or the same number of members as the other set, using the concept of one-to-one correspondence.
- K.2 The student, given a set containing 15 or fewer concrete objects, will
- tell how many are in the set by counting the number of objects orally;
 - write the numeral to tell how many are in the set; and
 - select the corresponding numeral from a given set of numerals.
- K.3 The student, given an ordered set of ten objects and/or pictures, will indicate the ordinal position of each object, first through tenth, and the ordered position of each object.
- K.4 The student will
- count forward to 100 and backward from 10;
 - identify one more than a number and one less than a number; and
 - count by fives and tens to 100.
- K.5 The student will identify the parts of a set and/or region that represent fractions for halves and fourths.
- 1.1 The student will
- count from 0 to 100 and write the corresponding numerals; and
 - group a collection of up to 100 objects into tens and ones and write the corresponding numeral to develop an understanding of place value.
- 1.2 The student will count forward by ones, twos, fives, and tens to 100 and backward by ones from 30.
- 1.3 The student will identify the parts of a set and/or region that represent fractions for halves, thirds, and fourths and write the fractions.
- 2.1 The student will
- read, write, and identify the place value of each digit in a three-digit numeral, using numeration models;
 - round two-digit numbers to the nearest ten; and
 - compare two whole numbers between 0 and 999, using symbols ($>$, $<$, or $=$) and words (*greater than*, *less than*, or *equal to*).
- 2.2 The student will
- identify the ordinal positions first through twentieth, using an ordered set of objects; and
 - write the ordinal numbers.
- 2.3 The student will
- identify the parts of a set and/or region that represent fractions for halves, thirds, fourths, sixths, eighths, and tenths;
 - write the fractions; and
 - compare the unit fractions for halves, thirds, fourths, sixths, eighths, and tenths.
- 2.4 The student will
- count forward by twos, fives, and tens to 100, starting at various multiples of 2, 5, or 10;
 - count backward by tens from 100; and
 - recognize even and odd numbers.

- 3.1 The student will
- read and write six-digit numerals and identify the place value and value of each digit;
 - round whole numbers, 9,999 or less, to the nearest ten, hundred, and thousand; and
 - compare two whole numbers between 0 and 9,999, using symbols ($>$, $<$, or $=$) and words (*greater than*, *less than*, or *equal to*).
- 3.2 The student will recognize and use the inverse relationships between addition/subtraction and multiplication/division to complete basic fact sentences. The student will use these relationships to solve problems.
- 3.3 The student will
- name and write fractions (including mixed numbers) represented by a model;
 - model fractions (including mixed numbers) and write the fractions' names; and
 - compare fractions having like and unlike denominators, using words and symbols ($>$, $<$, or $=$).
- 4.1 The student will
- identify orally and in writing the place value for each digit in a whole number expressed through millions;
 - compare two whole numbers expressed through millions, using symbols ($>$, $<$, or $=$); and
 - round whole numbers expressed through millions to the nearest thousand, ten thousand, and hundred thousand.
- 4.2 The student will
- compare and order fractions and mixed numbers;
 - represent equivalent fractions; and
 - identify the division statement that represents a fraction.
- 4.3 The student will
- read, write, represent, and identify decimals expressed through thousandths;
 - round decimals to the nearest whole number, tenth, and hundredth;
 - compare and order decimals; and
 - given a model, write the decimal and fraction equivalents.
- 5.1 The student, given a decimal through thousandths, will round to the nearest whole number, tenth, or hundredth.
- 5.2 The student will
- recognize and name fractions in their equivalent decimal form and vice versa; and
 - compare and order fractions and decimals in a given set from least to greatest and greatest to least.
- 5.3 The student will
- identify and describe the characteristics of prime and composite numbers; and identify and describe the characteristics of even and odd numbers
- 6.1 The student will describe and compare data, using ratios, and will use appropriate notations, such as $\frac{a}{b}$, a to b , and $a:b$.
- 6.2 The student will
- investigate and describe fractions, decimals, and percents as ratios;
 - identify a given fraction, decimal, or percent from a representation;
 - demonstrate equivalent relationships among fractions, decimals, and percents; and
 - compare and order fractions, decimals, and percents.

- 6.3 The student will
- identify and represent integers;
 - order and compare integers; and
 - identify and describe absolute value of integers.
- 6.4 The student will demonstrate multiple representations of multiplication and division of fractions.
- 6.5 The student will investigate and describe concepts of positive exponents and perfect squares.
- 7.1 The student will
- investigate and describe the concept of negative exponents for powers of ten;
 - determine scientific notation for numbers greater than zero;
 - compare and order fractions, decimals, percents, and numbers written in scientific notation;
 - determine square roots; and
 - identify and describe absolute value for rational numbers.
- 7.2 The student will describe and represent arithmetic and geometric sequences, using variable expressions.
- 8.1 The student will
- simplify numerical expressions involving positive exponents, using rational numbers, order of operations, and properties of operations with real numbers; and
 - compare and order decimals, fractions, percents, and numbers written in scientific notation.
- 8.2 The student will describe orally and in writing the relationships between the subsets of the real number system.

Computation and Estimation

- K.6 The student will model adding and subtracting whole numbers, using up to 10 concrete objects.
- 1.4 The student, given a familiar problem situation involving magnitude, will
- select a reasonable order of magnitude from three given quantities: a one-digit numeral, a two-digit numeral, and a three-digit numeral (e.g., 5, 50, 500); and
 - explain the reasonableness of the choice.
- 1.5 The student will recall basic addition facts with sums to 18 or less and the corresponding subtraction facts.
- 1.6 The student will create and solve one-step story and picture problems using basic addition facts with sums to 18 or less and the corresponding subtraction facts.
- 2.5 The student will recall addition facts with sums to 20 or less and the corresponding subtraction facts.
- 2.6 The student, given two whole numbers whose sum is 99 or less, will
- estimate the sum; and
 - find the sum, using various methods of calculation.
- 2.7 The student, given two whole numbers, each of which is 99 or less, will
- estimate the difference; and
 - find the difference, using various methods of calculation.
- 2.8 The student will create and solve one- and two-step addition and subtraction problems, using data from simple tables, picture graphs, and bar graphs.
- 2.9 The student will recognize and describe the related facts that represent and describe the inverse relationship between addition and subtraction.
- 3.4 The student will estimate solutions to and solve single-step and multistep problems involving the sum or difference of two whole numbers, each 9,999 or less, with or without regrouping.
- 3.5 The student will recall multiplication facts through the twelves table, and the corresponding division facts.
- 3.6 The student will represent multiplication and division, using area, set, and number line models, and create and solve problems that involve multiplication of two whole numbers, one factor 99 or less and the second factor 5 or less.
- 3.7 The student will add and subtract proper fractions having like denominators of 12 or less.
- 4.4 The student will
- estimate sums, differences, products, and quotients of whole numbers;
 - add, subtract, and multiply whole numbers;
 - divide whole numbers, finding quotients with and without remainders; and
 - solve single-step and multistep addition, subtraction, and multiplication problems with whole numbers.
- 4.5 The student will
- determine common multiples and factors, including least common multiple and greatest common factor;

- b) add and subtract fractions having like and unlike denominators that are limited to 2, 3, 4, 5, 6, 8, 10, and 12, and simplify the resulting fractions, using common multiples and factors;
 - c) add and subtract with decimals; and
 - d) solve single-step and multistep practical problems involving addition and subtraction with fractions and with decimals.
- 5.4 The student will create and solve single-step and multistep practical problems involving addition, subtraction, multiplication, and division with and without remainders of whole numbers.
- 5.5 The student will
- a) find the sum, difference, product, and quotient of two numbers expressed as decimals through thousandths (divisors with only one nonzero digit); and
 - b) create and solve single-step and multistep practical problems involving decimals.
- 5.6 The student will solve single-step and multistep practical problems involving addition and subtraction with fractions and mixed numbers and express answers in simplest form.
- 5.7 The student will evaluate whole number numerical expressions, using the order of operations limited to parentheses, addition, subtraction, multiplication, and division.
- 6.6 The student will
- a) multiply and divide fractions and mixed numbers; and
 - b) estimate solutions and then solve single-step and multistep practical problems involving addition, subtraction, multiplication, and division of fractions.
- 6.7 The student will solve single-step and multistep practical problems involving addition, subtraction, multiplication, and division of decimals.
- 6.8 The student will evaluate whole number numerical expressions, using the order of operations.
- 7.3 The student will
- a) model addition, subtraction, multiplication, and division of integers; and
 - b) add, subtract, multiply, and divide integers.
- 7.4 The student will solve single-step and multistep practical problems, using proportional reasoning.
- 8.3 The student will
- a) solve practical problems involving rational numbers, percents, ratios, and proportions; and
 - b) determine the percent increase or decrease for a given situation.
- 8.4 The student will apply the order of operations to evaluate algebraic expressions for given replacement values of the variables.
- 8.5 The student will
- a) determine whether a given number is a perfect square; and
 - b) find the two consecutive whole numbers between which a square root lies.

Measurement

- K.7 The student will recognize a penny, nickel, dime, and quarter and will determine the value of a collection of pennies and/or nickels whose total value is 10 cents or less.
- K.8 The student will identify the instruments used to measure length (ruler), weight (scale), time (clock: digital and analog; calendar: day, month, and season), and temperature (thermometer).
- K.9 The student will tell time to the hour, using analog and digital clocks.
- K.10 The student will compare two objects or events, using direct comparisons or nonstandard units of measure, according to one or more of the following attributes: length (shorter, longer), height (taller, shorter), weight (heavier, lighter), temperature (hotter, colder). Examples of nonstandard units include foot length, hand span, new pencil, paper clip, and block.
- 1.7 The student will
- identify the number of pennies equivalent to a nickel, a dime, and a quarter; and
 - determine the value of a collection of pennies, nickels, and dimes whose total value is 100 cents or less.
- 1.8 The student will tell time to the half-hour, using analog and digital clocks.
- 1.9 The student will use nonstandard units to measure length, weight/mass, and volume.
- 1.10 The student will compare, using the concepts of more, less, and equivalent,
- the volumes of two given containers; and
 - the weight/mass of two objects, using a balance scale.
- 1.11 The student will use calendar language appropriately (e.g., names of the months, *today*, *yesterday*, *next week*, *last week*).
- 2.10 The student will
- count and compare a collection of pennies, nickels, dimes, and quarters whose total value is \$2.00 or less; and
 - correctly use the cent symbol (¢), dollar symbol (\$), and decimal point (·).
- 2.11 The student will estimate and measure
- length to the nearest centimeter and inch;
 - weight/mass of objects in pounds/ounces and kilograms/grams, using a scale; and
 - liquid volume in cups, pints, quarts, gallons, and liters.
- 2.12 The student will tell and write time to the nearest five minutes, using analog and digital clocks.
- 2.13 The student will
- determine past and future days of the week; and
 - identify specific days and dates on a given calendar.
- 2.14 The student will read the temperature on a Celsius and/or Fahrenheit thermometer to the nearest 10 degrees.
- 3.8 The student will determine, by counting, the value of a collection of bills and coins whose total value is \$5.00 or less, compare the value of the bills and coins, and make change.
- 3.9 The student will estimate and use U.S. Customary and metric units to measure

- a) length to the nearest $\frac{1}{2}$ -inch, inch, foot, yard, centimeter, and meter;
 - b) liquid volume in cups, pints, quarts, gallons, and liters;
 - c) weight/mass in ounces, pounds, grams, and kilograms; and
 - d) area and perimeter.
- 3.10 The student will
- a) measure the distance around a polygon in order to determine perimeter; and
 - b) count the number of square units needed to cover a given surface in order to determine area.
- 3.11 The student will
- a) tell time to the nearest minute, using analog and digital clocks; and
 - b) determine elapsed time in one-hour increments over a 12-hour period.
- 3.12 The student will identify equivalent periods of time, including relationships among days, months, and years, as well as minutes and hours.
- 3.13 The student will read temperature to the nearest degree from a Celsius thermometer and a Fahrenheit thermometer. Real thermometers and physical models of thermometers will be used.
- 4.6 The student will
- a) estimate and measure weight/mass and describe the results in U.S. Customary and metric units as appropriate; and
 - b) identify equivalent measurements between units within the U.S. Customary system (ounces, pounds, and tons) and between units within the metric system (grams and kilograms).
- 4.7 The student will
- a) estimate and measure length, and describe the result in both metric and U.S. Customary units; and
 - b) identify equivalent measurements between units within the U.S. Customary system (inches and feet; feet and yards; inches and yards; yards and miles) and between units within the metric system (millimeters and centimeters; centimeters and meters; and millimeters and meters).
- 4.8 The student will
- a) estimate and measure liquid volume and describe the results in U.S. Customary units; and
 - b) identify equivalent measurements between units within the U.S. Customary system (cups, pints, quarts, and gallons).
- 4.9 The student will determine elapsed time in hours and minutes within a 12-hour period.
- 5.8 The student will
- a) find perimeter, area, and volume in standard units of measure;
 - b) differentiate among perimeter, area, and volume and identify whether the application of the concept of perimeter, area, or volume is appropriate for a given situation;
 - c) identify equivalent measurements within the metric system;
 - d) estimate and then measure to solve problems, using U.S. Customary and metric units; and
 - e) choose an appropriate unit of measure for a given situation involving measurement using U.S. Customary and metric units.

- 5.9 The student will identify and describe the diameter, radius, chord, and circumference of a circle.
- 5.10 The student will determine an amount of elapsed time in hours and minutes within a 24-hour period.
- 5.11 The student will measure right, acute, obtuse, and straight angles.
- 6.9 The student will make ballpark comparisons between measurements in the U.S. Customary System of measurement and measurements in the metric system.
- 6.10 The student will
- define π (pi) as the ratio of the circumference of a circle to its diameter;
 - solve practical problems involving circumference and area of a circle, given the diameter or radius;
 - solve practical problems involving area and perimeter; and
 - describe and determine the volume and surface area of a rectangular prism.
- 7.5 The student will
- describe volume and surface area of cylinders;
 - solve practical problems involving the volume and surface area of rectangular prisms and cylinders; and
 - describe how changing one measured attribute of a rectangular prism affects its volume and surface area.
- 7.6 The student will determine whether plane figures—quadrilaterals and triangles—are similar and write proportions to express the relationships between corresponding sides of similar figures.
- 8.6 The student will
- verify by measuring and describe the relationships among vertical angles, adjacent angles, supplementary angles, and complementary angles; and
 - measure angles of less than 360° .
- 8.7 The student will
- investigate and solve practical problems involving volume and surface area of prisms, cylinders, cones, and pyramids; and
 - describe how changing one measured attribute of a figure affects the volume and surface area.

Geometry

- K.11 The student will
- identify, describe, and trace plane geometric figures (circle, triangle, square, and rectangle); and
 - compare the size (larger, smaller) and shape of plane geometric figures (circle, triangle, square, and rectangle).
- K.12 The student will describe the location of one object relative to another (above, below, next to) and identify representations of plane geometric figures (circle, triangle, square, and rectangle) regardless of their positions and orientations in space.
- 1.12 The student will identify and trace, describe, and sort plane geometric figures (triangle, square, rectangle, and circle) according to number of sides, vertices, and right angles.
- 1.13 The student will construct, model, and describe objects in the environment as geometric shapes (triangle, rectangle, square, and circle) and explain the reasonableness of each choice.
- 2.15 The student will
- draw a line of symmetry in a figure; and
 - identify and create figures with at least one line of symmetry.
- 2.16 The student will identify, describe, compare, and contrast plane and solid geometric figures (circle/sphere, square/cube, and rectangle/rectangular prism).
- 3.14 The student will identify, describe, compare, and contrast characteristics of plane and solid geometric figures (circle, square, rectangle, triangle, cube, rectangular prism, square pyramid, sphere, cone, and cylinder) by identifying relevant characteristics, including the number of angles, vertices, and edges, and the number and shape of faces, using concrete models.
- 3.15 The student will identify and draw representations of points, line segments, rays, angles, and lines.
- 3.16 The student will identify and describe congruent and noncongruent plane figures.
- 4.10 The student will
- identify and describe representations of points, lines, line segments, rays, and angles, including endpoints and vertices; and
 - identify representations of lines that illustrate intersection, parallelism, and perpendicularity.
- 4.11 The student will
- investigate congruence of plane figures after geometric transformations, such as reflection, translation, and rotation, using mirrors, paper folding, and tracing; and
 - recognize the images of figures resulting from geometric transformations, such as translation, reflection, and rotation.
- 4.12 The student will
- define *polygon*; and
 - identify polygons with 10 or fewer sides.
- 5.12 The student will classify
- angles as right, acute, obtuse, or straight; and
 - triangles as right, acute, obtuse, equilateral, scalene, or isosceles.

- 5.13 The student, using plane figures (square, rectangle, triangle, parallelogram, rhombus, and trapezoid), will
- develop definitions of these plane figures; and
 - investigate and describe the results of combining and subdividing plane figures.
- 6.11 The student will
- identify the coordinates of a point in a coordinate plane; and
 - graph ordered pairs in a coordinate plane.
- 6.12 The student will determine congruence of segments, angles, and polygons.
- 6.13 The student will describe and identify properties of quadrilaterals.
- 7.7 The student will compare and contrast the following quadrilaterals based on properties: parallelogram, rectangle, square, rhombus, and trapezoid.
- 7.8 The student, given a polygon in the coordinate plane, will represent transformations (reflections, dilations, rotations, and translations) by graphing in the coordinate plane.
- 8.8 The student will
- apply transformations to plane figures; and
 - identify applications of transformations.
- 8.9 The student will construct a three-dimensional model, given the top or bottom, side, and front views.
- 8.10 The student will
- verify the Pythagorean Theorem; and
 - apply the Pythagorean Theorem.
- 8.11 The student will solve practical area and perimeter problems involving composite plane figures.

Probability and Statistics

- K.13 The student will gather data by counting and tallying.
- K.14 The student will display gathered data in object graphs, picture graphs, and tables, and will answer questions related to the data.
- 1.14 The student will investigate, identify, and describe various forms of data collection (e.g., recording daily temperature, lunch count, attendance, favorite ice cream), using tables, picture graphs, and object graphs.
- 1.15 The student will interpret information displayed in a picture or object graph, using the vocabulary *more*, *less*, *fewer*, *greater than*, *less than*, and *equal to*.
- 2.17 The student will use data from experiments to construct picture graphs, pictographs, and bar graphs.
- 2.18 The student will use data from experiments to predict outcomes when the experiment is repeated.
- 2.19 The student will analyze data displayed in picture graphs, pictographs, and bar graphs.
- 3.17 The student will
- collect and organize data, using observations, measurements, surveys, or experiments;
 - construct a line plot, a picture graph, or a bar graph to represent the data; and
 - read and interpret the data represented in line plots, bar graphs, and picture graphs and write a sentence analyzing the data.
- 3.18 The student will investigate and describe the concept of probability as chance and list possible results of a given situation.
- 4.13 The student will
- predict the likelihood of an outcome of a simple event; and
 - represent probability as a number between 0 and 1, inclusive.
- 4.14 The student will collect, organize, display, and interpret data from a variety of graphs.
- 5.14 The student will make predictions and determine the probability of an outcome by constructing a sample space.
- 5.15 The student, given a problem situation, will collect, organize, and interpret data in a variety of forms, using stem-and-leaf plots and line graphs.
- 5.16 The student will
- describe mean, median, and mode as measures of center;
 - describe mean as fair share;
 - find the mean, median, mode, and range of a set of data; and
 - describe the range of a set of data as a measure of variation.
- 6.14 The student, given a problem situation, will
- construct circle graphs;
 - draw conclusions and make predictions, using circle graphs; and
 - compare and contrast graphs that present information from the same data set.
- 6.15 The student will
- describe mean as balance point; and
 - decide which measure of center is appropriate for a given purpose.
- 6.16 The student will

- a) compare and contrast dependent and independent events; and
 - b) determine probabilities for dependent and independent events.
- 7.9 The student will investigate and describe the difference between the experimental probability and theoretical probability of an event.
- 7.10 The student will determine the probability of compound events, using the Fundamental (Basic) Counting Principle.
- 7.11 The student, given data for a practical situation, will
- a) construct and analyze histograms; and
 - b) compare and contrast histograms with other types of graphs presenting information from the same data set.
- 8.12 The student will determine the probability of independent and dependent events with and without replacement.
- 8.13 The student will
- a) make comparisons, predictions, and inferences, using information displayed in graphs; and
 - b) construct and analyze scatterplots.

Patterns, Functions, and Algebra

- K.15 The student will sort and classify objects according to attributes.
- K.16 The student will identify, describe, and extend repeating patterns.
- 1.16 The student will sort and classify concrete objects according to one or more attributes, including color, size, shape, and thickness.
- 1.17 The student will recognize, describe, extend, and create a wide variety of growing and repeating patterns.
- 1.18 The student will demonstrate an understanding of equality through the use of the equal sign.
- 2.20 The student will identify, create, and extend a wide variety of patterns.
- 2.21 The student will solve problems by completing numerical sentences involving the basic facts for addition and subtraction. The student will create story problems, using the numerical sentences.
- 2.22 The student will demonstrate an understanding of equality by recognizing that the symbol = in an equation indicates equivalent quantities and the symbol \neq indicates that quantities are not equivalent.
- 3.19 The student will recognize and describe a variety of patterns formed using numbers, tables, and pictures, and extend the patterns, using the same or different forms.
- 3.20 The student will
- investigate the identity and the commutative properties for addition and multiplication; and
 - identify examples of the identity and commutative properties for addition and multiplication.
- 4.15 The student will recognize, create, and extend numerical and geometric patterns.
- 4.16 The student will
- recognize and demonstrate the meaning of equality in an equation; and
 - investigate and describe the associative property for addition and multiplication.
- 5.17 The student will describe the relationship found in a number pattern and express the relationship.
- 5.18 The student will
- investigate and describe the concept of variable;
 - write an open sentence to represent a given mathematical relationship, using a variable;
 - model one-step linear equations in one variable, using addition and subtraction; and
 - create a problem situation based on a given open sentence, using a single variable.
- 5.19 The student will investigate and recognize the distributive property of multiplication over addition.
- 6.17 The student will identify and extend geometric and arithmetic sequences.
- 6.18 The student will solve one-step linear equations in one variable involving whole number coefficients and positive rational solutions.
- 6.19 The student will investigate and recognize
- the identity properties for addition and multiplication;

- b) the multiplicative property of zero; and
 - c) the inverse property for multiplication.
- 6.20 The student will graph inequalities on a number line.
- 7.12 The student will represent relationships with tables, graphs, rules, and words.
- 7.13 The student will
- a) write verbal expressions as algebraic expressions and sentences as equations and vice versa; and
 - b) evaluate algebraic expressions for given replacement values of the variables.
- 7.14 The student will
- a) solve one- and two-step linear equations in one variable; and
 - b) solve practical problems requiring the solution of one- and two-step linear equations.
- 7.15 The student will
- a) solve one-step inequalities in one variable; and
 - b) graph solutions to inequalities on the number line.
- 8.14 The student will make connections between any two representations (tables, graphs, words, and rules) of a given relationship.
- 8.15 The student will
- a) solve multistep linear equations in one variable with the variable on one and two sides of the equation;
 - b) solve two-step linear inequalities and graph the results on a number line; and
 - c) identify properties of operations used to solve an equation.
- 8.16 The student will graph a linear equation in two variables.
- 8.17 The student will identify the domain, range, independent variable, or dependent variable in a given situation.