



Program Transfer Goals

- Use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution.
- Select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems.
- Communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate.
- Display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication.

PACING

First Grading Period		Second Grading Period		Third Grading Period			Fourth Grading Period		
Unit 1: Number Sense	Unit 2: Operations	Unit 3: Expressions, Equations, Inequalities, and Relationships	Unit 4: Ratios, Rates, and Proportions	Unit 5: Multiple Representations	Unit 6: Geometry	Unit 7: Data Analysis	Unit 8: Probability	Unit 9: Personal Financial Literacy	
BOY Screener		MOY Screener			EOY Screener				

Assurances for a Guaranteed and Viable Curriculum

Adherence to this scope and sequence affords every member of the learning community clarity on the knowledge and skills on which each learner should demonstrate proficiency. In order to deliver a guaranteed and viable curriculum, our team commits to and ensures the following understandings:

Shared Accountability: Responding to the Needs of All Learners

- High levels of learning for all students.
- The district and course formative assessments aligned to the standards for this course support educators and learners in monitoring academic achievement and leveraging interventions.

Shared Understanding: Curriculum Design

- The district curriculum design weaves together the elements of content, skills and assessments in order to adhere to curriculum design at the macro and micro level, ensuring vertical alignment.
- The district curriculum incorporates standards, scope and sequence, enduring understandings, essential questions, performance assessments, and recommended resources.

Interdependence: Curriculum Units

Members of the learning community utilize the curriculum units, plan collaboratively, and reflect on results for continuous improvement.

UNIT 1: NUMBER SENSE

TIMELINE: 4 WEEKS - 1ST GRADING PERIOD

This unit begins with a study of numbers in sets and subsets. Visual representations are used to categorize and organize the numbers. The unit continues as learners identify numbers, their opposites, and absolute values. Equivalent forms of benchmark fractions will support learners' exploration of equivalence as they locate, compare, and ordering integers and rational numbers using number lines. The unit concludes with a study of the properties of whole numbers including inverse, identity, commutative, associative, and distributive properties.

■ Transfer Goal:

- o Select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems involving equivalence of numbers.

Students will know...

sets and subsets of numbers; absolute value is the magnitude of a number without regard to its sign; scale of fractional values; properties are used to preserve equivalence

Students will be skilled at...

classifying whole numbers, integers, and rational numbers using a visual representation such as a Venn diagram to describe relationships between sets of numbers; identifying a number, its opposite, and its absolute value; locating, comparing, and ordering integers and rational numbers using a number line; ordering a set of benchmark fractions arising from mathematical and real-world contexts; representing ratios and percents with concrete models, fractions, and decimals; representing benchmark fractions and percents such as 1%, 10%, 25%, $33\frac{1}{3}\%$, and multiples of these values using 10 by 10 grids, strip diagrams, number lines, and numbers; generating equivalent forms of benchmark fractions; using equivalent fractions, decimals, and percents to show equal parts of the same whole; graphing points in all four quadrants using ordered pairs of rational numbers; extending previous knowledge of sets and subsets using a visual representation to describe relationships between sets of rational numbers

UNIT 2: OPERATIONS

TIMELINE: 7 WEEKS - 1ST-2ND GRADING PERIOD

The learners begin this unit by building on their experience with addition, subtraction, multiplication, and division to demonstrate fluency with these operations with integers. Their study of equivalence continues as they use order of operations and prime factorization to generate equivalent numerical expressions. Then, the learners explore decimal operations followed by fraction operations. Application of the operations include practice balancing a check register. The learners extend their thinking as they learn to add, subtract, multiply, and divide rational numbers fluently.

■ Transfer Goal:

- Use the four-step problem-solving model to solve real-world problems with rational numbers.
- Communicate equivalence using symbols and language as appropriate.

Students will know...

rules of integer operations; order of operations

Students will be skilled at...

determining, with and without computation, whether a quantity is increased or decreased when multiplied by a fraction, including values greater than or less than one; representing integer operations with concrete models and connecting the actions with the models to standardized algorithms; adding, subtracting, multiplying, and dividing integers fluently; multiplying and dividing positive rational numbers fluently; generating equivalent numerical expressions using order of operations, including whole number exponents and prime factorization; balancing a check register that includes deposits, withdrawals, and transfers; add, subtract, multiply, and divide rational numbers fluently; apply and extend previous understandings of operations to solve problems using addition, subtraction, multiplication, and division of rational numbers

UNIT 3: EXPRESSIONS, EQUATIONS, INEQUALITIES, AND RELATIONSHIPS

TIMELINE: 3 WEEKS - 2ND GRADING PERIOD

This unit begins with the learner modeling and solving equations and inequalities that represent problem situations, including within geometric concepts. Solutions to the equations are graphed on number lines. Then, the learners apply their understanding to write real-world problems given equations and inequalities and write equations and inequalities given real-world problems.

■ Transfer Goal:

- o Use the four-step problem-solving model to solve real-world problems represented by equations and inequalities.
- o Display, explain, and justify solutions to equations and inequalities.
- o Communicate algebraic relationships using multiple representations, including symbols and language as appropriate.

Students will know...

solutions to equations and inequalities can be displayed on a number line; the relevance of variables, constants, and operations in equations and inequalities

Students will be skilled at...

distinguishing between expressions and equations verbally, numerically, and algebraically; determining if two expressions are equivalent using concrete models, pictorial models, and algebraic models, and algebraic representations; writing one-variable, one-step equations and inequalities to represent constraints or conditions within problems; representing solutions for one-variable, one-step equations and inequalities on number lines; writing corresponding real-world problems given one-variable, one-step equations or inequalities; modeling and solving one-variable, one-step equations and inequalities that represent problems, including geometric concepts; determining if the given value(s) make(s) one-variable, one-step equations or inequalities true; writing one-variable, two-step equations and inequalities to represent constraints or conditions within problems; representing solutions for one-variable, two-step equations and inequalities on number lines; writing a corresponding real-world problem given a one-variable, two-step equation or inequality; modeling and solve one-variable, two-step equations and inequalities; determining if the given value(s) make(s) one-variable, two-step equations and inequalities true; writing and solving equations using geometry concepts, including the sum of the angles in a triangle, and angle relationships

UNIT 4: RATIOS, RATES, AND PROPORTIONS

TIMELINE: 4 WEEKS - 3RD GRADING PERIOD

This unit of study focuses on ratios, rates, and proportions. First, learners represent, compare, and apply unit rates and proportions, including applications of scale factor with similarity and scale drawings. Through the lens of measurement, learners use proportions to convert measures within and beyond measurement systems. Then, learners use percent proportions to solve problems involving sales tax, income tax, discount, percent increase, and percent decrease.

■ Transfer Goal:

- o Use the four-step problem-solving model to solve real-world problems related to ratios, rates, and proportions.
- o Communicate proportions and unit rates in mathematical and real-world situations using multiple algebraic representations.

Students will know...

the scale factor is the ratio of any two corresponding lengths in two similar geometric figures; a percent proportion is used to find the whole given a part and the percent or to find the part given the whole and the percent; scale factor is used to calculate measures in scale drawings

Students will be skilled at...

applying qualitative and quantitative reasoning to solve prediction and comparison of real world problems involving ratios and rates; giving examples of ratios as multiplicative comparisons of two quantities describing the same attribute; giving examples of rates as the comparison by division of two quantities having different attributes, including rates and quotients; representing ratios and percents with concrete models, fractions, and decimals; converting units within a measurement system, including the use of proportions and unit rates; representing mathematical and real-world problems involving ratios and rates using scale factors, tables, graphs, and proportions; solving real-world problems to find the whole given a part and the percents, to find the part given the whole and the percent, and to find the percent given the part and the whole, including the use of concrete and pictorial models; calculating unit rates from rates in mathematical and real-world problems; solving problems involving ratios, rates, and percents, including multi-step problems involving percent increase and percent decrease, and financial literacy problems; generalizing the critical attributes of similarity, including ratios within and between similar shapes; solving mathematical and real-world problems involving similar shape and scale drawings; converting between measurement systems, including the use of proportions and the use of rates; calculating the sales tax for a given purchase and calculate income tax for earned wages; analyzing and comparing monetary incentives, including sales, rebates, and coupons

UNIT 5: MULTIPLE REPRESENTATIONS

TIMELINE: 3 WEEKS - 3RD GRADING PERIOD

This unit of study continues the learners' study of algebraic concepts. First, an exploration of independent and dependent quantities is accessed through tables and graphs as the learners identify rate of change in problem situations. Then, they write equations to represent relationships between quantities in table form. The learners apply their understanding of algebraic relationships using multiple representations, including verbal descriptions, tables, graphs, and equations. As an extension from their 5th grade mathematics study of algebraic relationships, the learners compare rules in the forms: $y = ax$ and $y = x + a$ and extend this understanding into a study of the constant of proportionality.

■ Transfer Goal:

- o Use the four-step problem-solving model to solve real-world problems related to rate of change.
- o Communicate constant rates of change in mathematical and real-world situations using multiple algebraic representations.

Students will know...

additive relationships are written in the form $y = x + a$ and multiplicative relationships are written in the form $y = ax$; the value of a dependent variable is affected by the value of the independent variable; the constant of proportionality is determined by dividing the value of the dependent variable by the value of the independent variable; related multiple representations communicate the same relationship

Students will be skilled at...

comparing two rules verbally, numerically, graphically, and symbolically in the form $y=ax$ or $y= x + a$ in order to differentiate between additive and multiplicative relationships; identifying independent and dependents from tables and graphs; writing an equation that represents the relationship between independent and dependent quantities from a table; representing a given situation using verbal descriptions, tables, graphs, equations in the form $y=kx$ or $y = x + b$; representing constant rates of change in mathematical and real-world problems given pictorial, tabular, verbal, numeric, graphical, and algebraic representations, include $d = rt$; determining the constant of proportionality ($k = y/x$) within mathematical and real-world problems; representing linear relationships using verbal descriptions, tables, graphs, and equations that simplify to the form $y = mx + b$

UNIT 6: GEOMETRY

TIMELINE: 3 WEEKS - 3RD GRADING PERIOD

This unit begins with a study of triangle properties, including the sum of the angles of a triangle, the relationship between the lengths of sides and measures of angles in a triangle, and determining when three lengths form a triangle. Continued from their experience in 5th grade, the learners model area formulas for polygons including parallelograms, trapezoids, and triangles before they determine solutions to problems involving area of these figures. Area and circumference of circles as well as area of composite figures are determined from problem situations. The unit of study concludes with an exploration of surface area with nets and volume, including right rectangular prisms with dimensions of positive rational numbers.

■ Transfer Goal:

- o Use the four-step problem-solving model to solve real-world problems related to geometric relationships.
- o Select tools, including real objects and manipulatives, paper and pencil, and techniques including mental math, estimation, and number sense, as appropriate, to solve problems involving circumference, area, surface area, and volume.

Students will know...

properties of triangles and angle relationships; relevance of variables in area formulas for rectangles, parallelograms, trapezoids, and triangles, and the volume formula for right rectangular prisms; pi is calculated by dividing the measure of the circumference of a circle by its diameter; composite area is the sum of the area of the joined figures; difference between lateral and total surface area; relevance of various variables in circumference, area, surface area and volume formulas

Students will be skilled at...

Determining the relationship between the lengths of sides and measures of angles in a triangle, and determining when three lengths form a triangle; modeling area formulas for parallelograms, trapezoids, and triangles by decomposing and rearranging parts of these shapes; writing equations that represent problems related to the area of rectangles, parallelograms, trapezoids, and triangles and volume of right rectangular prisms where dimensions are positive rational numbers; determining solutions for problems involving the area of rectangles, parallelograms, trapezoids, and triangles and volume of right rectangular prisms where dimensions are positive rational numbers; modeling and solving one-variable, one-step equations and inequalities that represent problems, including geometric concepts; describing pi as the ratio of the circumference of a circle to its diameter; modeling the relationship between the volume of a rectangular prism and a rectangular pyramid having both congruent bases and heights that connect that relationship to the formulas; explaining verbally and symbolically the relationship between the volume of a triangular prism and a triangular pyramid having both congruent bases and heights and connect that relationship to the formulas; using models to determine the approximate formulas for the circumference and area of a circle and connect the models to the actual formulas; solving problems involving the volume of rectangular prisms, triangular prisms, rectangular pyramids, and triangular pyramids; determining the circumference and area of circles; determining the area of composite figures containing combinations of rectangles, squares, parallelograms, trapezoids, triangles, semicircles, and quarter circles; solving problems involving the lateral and total surface area of a rectangular prism, rectangular pyramid, triangular prism, and triangular pyramid by determining the area of the shape's net

UNIT 7: DATA ANALYSIS

TIMELINE: 1.5 WEEKS - 4TH GRADING PERIOD

This unit of study includes data analysis. The learners represent data in various graphical forms, including dot plots, stem-and-leaf plots, histograms, box plots, bar graphs, relative frequency tables, and circle graphs. Then, they interpret these graphs and use their interpretations to describe the center, spread, and shape of the data distribution. The unit of study continues as learners summarize numeric and categorical data and distinguish between situations that yield data with and without variability.

■ Transfer Goal:

- o Use the four-step problem-solving model to construct and analyze data in various graphical formats.
- o Communicate conclusions based on data using graphs and language as appropriate.

Students will know...

the appropriate type of graph to use for specific data sets, including dot plots, stem-and-leaf plots, histograms, and box plots; the difference between situations that yield data with and without variability.

Students will be skilled at...

representing numeric data graphically, including dot plots, stem-and-leaf plots, histograms, and box plots; using the graphical representation of numeric data to describe the center, spread, and shape of the data distribution; summarizing numeric data with numerical summaries, including the mean and median (measures of center) and the range and interquartile range (IQR) (measures of spread), and use these summaries to describe the center, spread, and shape of the data distribution; summarizing categorical data with numerical and graphical summaries, including the mode, the percent of values in each category (relative frequency table), and the percent bar graph, and use these summaries to describe the data distribution; interpreting numeric data summarized in dot plots, stem-and-leaf plots, histograms, and box plots; distinguishing between situations that yield data with and without variability; comparing two groups of numeric data using comparative dot plots or box plots by comparing their shapes, centers, and spread

UNIT 8: PROBABILITY

TIMELINE: 1.5 WEEKS - 4TH GRADING PERIOD

This unit includes the study of probability. First, the learners use lists and tree diagrams to create sample spaces to find probabilities for simple and compound events. They explore probability simulations and use theoretical and experimental data to make predictions. Random samples are utilized to make inferences about the corresponding population.

■ Transfer Goal:

- o Use the four-step problem-solving model to construct and analyze data in various graphical formats.
- o Communicate conclusions based on data using graphs and language as appropriate.
- o Display, explain, and justify inferences about a population based on a random sample.

Students will know...

the difference between theoretical and experimental probability; the qualities of a random sample

Students will be skilled at...

representing sample spaces for simple and compound events using lists and tree diagrams; selecting and using different simulations to represent simple and compound events with and without technology; making predictions and determine solutions using experimental data for simple and compound events; making predictions and determining solutions using theoretical probability for simple and compound events; finding the probabilities of a simple event and its complement and describe the relationship between the two; solving problems using qualitative and quantitative predictions and comparisons from simple experiments; determining experimental and theoretical probabilities related to simple and compound events using data and sample spaces; using data from a random sample to make inferences about a population; comparing two populations based on data in random samples from these populations including informal comparative inferences about differences between the two populations

UNIT 9: PERSONAL FINANCIAL LITERACY

TIMELINE: 2 WEEKS - 4TH GRADING PERIOD

This final unit involves the study of personal financial literacy. The learners begin by exploring the impacts of choosing and using a bank. They distinguish between debit and credit cards and the features of a checking account and debit card offered at various banks. Then, they explore credit history and credit reports and the impacts on each. The unit of study continues as the learners compare various methods of pay for college and research salaries and careers. Assets, liabilities, net worth statements as well as simple and compound interest are the final concepts of this unit.

■ Transfer Goal:

- o Use the four-step problem-solving model to solve real-world problems related to personal financial literacy.
- o Display, explain, and justify financial decision making processes.

Students will know...

the differences between debit and credit; the differences between deposits, withdrawals, and transfers; what impacts credit history; the value of credit reports; methods to pay for college; the aspects of a net worth statement

Students will be skilled at...

comparing the features and cost of a checking account and a debit card offered by different local financial institutions; distinguishing between debit and credit cards; balancing a check register that includes deposits, withdrawals, and transfers; explaining why it is important to establish a positive credit history; describing the information in a credit report and how long it is retained; describing the value of credit reports to borrowers and to lenders; explaining various methods to pay for college, including through savings, grants, scholarships, student loans, and work-study; comparing the annual salary of several occupations requiring various levels of post-secondary education or vocational training and calculate the effects of the different annual salaries on lifetime income; identifying the components of a personal budget, including income; planned savings for college, retirement, and emergencies, taxes; and fixed and variable expenses, and calculate what percentage each category comprises of the total budget; creating and organizing a financial assets and liabilities record and construct a net worth statement; using a family budget estimator to determine the minimum household budget and average hourly wage needed for a family to meet its basic needs in the student's city or another large city nearby; calculating and comparing simple interest and compound interest earnings