



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: Numerical Representations and Relationships	Unit 2: Computations and Algebraic Relationships: Equations and Inequalities	Unit 3: Surface Area and Volume	Unit 4: Computations and Algebraic Relationships: Multiple Representations	Unit 5: Transformational Geometry	Unit 6: Data Analysis	Unit 7: Personal Financial Literacy
BOY Screener				MOY 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: NUMERICAL REPRESENTATIONS AND RELATIONSHIPS

TIMELINE: 3 WEEKS - 1ST GRADING PERIOD

The unit begins with an introduction to the graphing calculator as a tool . The learners will use the graphing calculator throughout this course in order to build algebra readiness skills as indicated in the state standards (TEKS). As they study numbers in a variety of sets and subsets, the learners use visual representations to categorize and organize the numbers. Irrational numbers, including pi, and square roots are approximated, compared and ordered as the learners continue to study equivalence and scale. Scientific notation is introduced later in the unit.

■ 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 converting numbers into equivalent forms and comparing and ordering numbers.
- o Communicate scale and order of numbers using symbols, diagrams, number lines, and language as appropriate.

Students will know...

sets and subsets of real numbers, including counting or natural numbers, whole numbers, integers, rational numbers, and irrational numbers; scientific notation is used to communicate numbers efficiently

Students will be skilled at...

using the graphing calculator fluently; creating a visual representation to describe relationships between sets of numbers; approximating the value of an irrational number; locating an approximation of an irrational number on a number line; converting between scientific notation and decimal notation; ordering a set of real numbers arising from mathematical and real-world contexts

UNIT 2: COMPUTATIONS AND ALGEBRAIC RELATIONSHIPS: EQUATIONS AND INEQUALITIES

TIMELINE: 5 WEEKS - 1ST GRADING PERIOD

The learners begin this unit by writing real-world problem situations to represent given equations or inequalities. They also write one-variable equations or inequalities with variables on both sides that represent given real-world problem situations. This translation between verbal and algebraic forms builds understanding of multiple representations of the mathematical relationships. Then, the learners model and solve, with real objects or manipulatives and tools, algebraic equations to represent real-world problems. As they continue their study of equations and inequalities, the learners apply the concepts to geometry, through the lens of triangles, angles, and parallel lines, as well as the Pythagorean Theorem. Finally, as an application of personal financial literacy, the learners calculate simple and compound interest in real-world situations.

■ Transfer Goal:

- Use the four-step problem-solving model to solve real-world problems related to geometry and personal financial literacy.
- Communicate algebraic relationships using multiple representations, including symbols and language as appropriate.

Students will know...

relevance of constants and variables in inequalities and equations; the sum of the angles in a triangle; angle relationships

Students will be skilled at...

writing equations and inequalities from problem situations; writing problem situations from equations and inequalities; modeling equations that represent mathematical and real-world problems; solving equations that represent mathematical and real-world situations; using equations and inequalities to find missing measures in geometric concepts including angle measures; calculating simple and compound interest; modeling and describing the Pythagorean Theorem; applying the Pythagorean Theorem to solve problems

UNIT 3: SURFACE AREA AND VOLUME

TIMELINE: 4 WEEKS - 2ND GRADING PERIOD

Building upon their previous knowledge of surface area from 7th grade, the learners explore lateral and total surface area and solve problems related to rectangular prisms, triangular prisms, and cylinders. This unit of study also includes volume of cylinders, cones, and spheres.

■ Transfer Goal:

- Use the four-step problem-solving model to solve real-world problems related to surface area and volume.
- Display, explain, and justify relationships between models and the formulas to determine surface area and volume.

Students will know...

3-dimensional figures, including rectangular prisms, triangular prisms, cylinders, cones, and spheres; difference between lateral and total surface area; relevance of various variables in surface area and volume formulas

Students will be skilled at...

connecting the formulas for lateral and total surface area to models; solving problems related to lateral and total surface area; calculating lateral and total surface area of rectangular prisms, triangular prisms, cylinders; describing the volume formula related to cylinders; modeling the relationship between the volume of a cylinder and a cone having congruent bases and heights; solving problems involving the volume of cylinders, cones, and spheres

UNIT 4: COMPUTATIONS AND ALGEBRAIC RELATIONSHIPS: MULTIPLE REPRESENTATIONS

TIMELINE: 6 WEEKS - 2ND-3RD GRADING PERIOD

During this unit of study, learners explore non-proportional and proportional relationships. Data in the form of tables and graphs are used to determine the rate of change or slope and y-intercept, and the significance of each, in mathematical and real-world problems. Similar right triangles are used to develop the understanding of slope. Connections are developed through multiple representations of linear relationships, including verbal, numeric, tabular, and graphical representations. As the learners compare non-proportional to proportional situations, various representations are used to communicate the key features. The unit concludes with a study of functions. This understanding will build throughout Algebra.

■ Transfer Goal:

- o Select tools, including algebraic representations of linear relationships, to solve problems.
- o Communicate relationships in mathematical and real-world situations using multiple algebraic representations.

Students will know...

slope is the rate of change of one variable with respect to another in a problem situation; related multiple representations communicate the same relationship; proportional and non-proportional situations can be distinguished; functions can be identified using sets of ordered pairs, tables, mappings, and graphs

Students will be skilled at...

determining the rate of change or slope and y-intercept in mathematical and real-world problems; writing an equation in the form $y=mx+b$ to model a linear relationship using verbal, numerical, tabular, and graphical representations; distinguishing between proportional and non-proportional situations using tables, graphs, and equations; representing linear proportional situations with tables, graphs, and equations; representing linear non-proportional situations with tables, graphs, and equations; graphing proportional relationships; interpreting the unit rate as the slope of the line; solving problems involving direct variation; identifying functions using sets of ordered pairs, tables, mappings, and graphs; identifying examples of proportional and non-proportional functions that arise from mathematical and real-world problems

UNIT 5: TRANSFORMATIONAL GEOMETRY

TIMELINE: 4 WEEKS - 3RD GRADING PERIOD

This unit of study focuses on transformations of geometric shapes. The learners consider shapes with vertices plotted on a coordinate plane as they explain the effect of translations and reflections of the shapes. The learners distinguish between transformations that preserve congruence and those that do not. The unit continues as learners explore dilations and proportional change. That is, when a positive rational scale factor is applied to a two-dimensional figure on a coordinate plane, they will use an algebraic representation to explain the effect.

■ Transfer Goal:

- o Select tools including coordinate planes and patty paper to solve problems related to transform of two-dimensional shapes.
- o Display, explain, and justify algebraic representations related to geometric transformations of two-dimensional shapes.

Students will know...

transformations that preserve congruence and those that do not

Students will be skilled at...

generalizing the properties of orientation and congruence of rotations, reflections, translations, and dilations; generalizing that the ratio of corresponding sides of similar shapes are proportional; comparing and contrasting the attributes of a shape and its dilation(s) on a coordinate plane; using an algebraic representation to explain the effect of a given positive rational scale factor applied to two-dimensional figures on a coordinate plane with the origin as the center of dilation; differentiating between transformations that preserve congruence and those that do not; modeling the effects on linear and area measurements of dilated two-dimensional shapes

UNIT 6: DATA ANALYSIS

TIMELINE: 2 WEEKS - 3RD GRADING PERIOD

This unit includes the study of scatterplots and data. The learners construct scatterplots and describe the data to answer questions. Trend lines are used to approximate the linear relationship between the sets of data. The learners apply their understanding of scatterplots to contrast bivariate sets of data that suggest a linear relationship with sets of data that do not, based on a graphical representation. As the learners study data, they simulate generating random samples and determine the mean absolute deviation of data.

■ **Transfer Goal:**

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

Students will know...

data displayed in scatterplots may communicate linear, non-linear, or no association among the data; trend lines are used to approximate linear relationships; random sampling is representative of the population from which it is selected

Students will be skilled at...

constructing a scatterplot and describe the observed data to address questions of association such as linear, non-linear, and no association between bivariate data; using a trend line that approximates the linear relationship between bivariate sets of data to make predictions; contrasting bivariate sets of data that suggest a linear relationship with bivariate sets of data that do not suggest a linear relationship from a graphical representation; simulating the generation of random samples of the same size from a population with known characteristics to develop the notion of a random sample being representative of the population from which it was selected; determining the mean absolute deviation and use this quantity as a measure of the average distance data are from the mean using a data set of no more than 10 data points

UNIT 7: PERSONAL FINANCIAL LITERACY

TIMELINE: 3 WEEKS - 4TH GRADING PERIOD

This final unit in 8th grade mathematics involves the study of personal financial literacy. The learners begin by estimating the cost of college. Then, they explore methods to save for college, including repaying student loans. Finally, they make connections to simple and compound interest as it relates to earnings.

■ 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...

interest rate and loan length each impacts the cost of credit; methods for saving money; advantages and disadvantages of different payment methods; benefits and costs of financial responsibility

Students will be skilled at...

solving real world problems comparing how interest rate and loan length affect the cost of credit; calculating the total cost of repaying a loan, including credit cards and easy access loans, under various rates of interest and over different periods using an online calculator; explaining how small amounts of money invested regularly, including money saved for college and retirement, grow over time; calculating and comparing simple interest and compound interest earnings; identifying and explaining the advantages and disadvantages of different payment methods; analyzing situations to determine if they represent financially responsible decisions and identify the benefits of financial responsibility and the cost of financial responsibility; estimating the cost of a two year and four year college education, including family contribution and devise a periodic savings plan for accumulating the money needed to contribute to the total cost attendance for at least the first year of college