Grade 8 Math
Overview
2021-2022

This document is designed to provide parents/guardians/community an overview of the curriculum taught in the FBISD classroom. This document supports families in understanding the learning goals for the course, and how students will demonstrate what they know and are able to do. The overview offers suggestions or possibilities to reinforce learning at home.

Included at the end of this document, you will find:

- A glossary of curriculum components
- The content area instructional model
- Parent resources for this content area

To advance to a particular grading period, click on a link below.

- Grading Period 1
- Grading Period 2
- Grading Period 3
- Grading Period 4

At Home Connections

The following are suggestions for reinforcing number sense and mathematical reasoning at home. These ideas can be used throughout the school year. You will find additional ideas to reinforce learning at home within each unit below.

- Ask questions that require students to describe and elaborate on their thinking and reasoning. Topics can be about everyday things as well as mathematics.
- Engage students in situations that challenge them to inquire and persevere through questioning.
- Play card games with students
- Play games with students such as Mancala, Yahtzee, Blokus, Rack-O, Mastermind, etc.
- Work number puzzles such as Sudoku, KenKen, Kakuro, or Numbrix.

Process Standards

The process standards describe ways in which students are expected to engage in the content. The process standards weave the other knowledge and skills together so that students may be successful problem solvers and use knowledge learned efficiently and effectively in daily life.

The student uses mathematical process to acquire and demonstrate mathematical understanding. The student is expected to:

- 8.1A Apply mathematics to problems arising in everyday life, society, and the workplace
- 8.1B 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
- 8.1C 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
- 8.1D Communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate
- 8.1E Create and use representations to organize, record, and communicate mathematical ideas
- 8.1F Analyze mathematical relationships to connect and communicate mathematical ideas
- 8.1G Display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication

Grading Period 1	
Unit 1: Represent and Apply Real Numbers Estimated Date Range: Aug. 11 – Sept. 15 Estimated Time Frame: 25 days	
Unit Overview: In this unit, students will continue to examine the relationship of sets and subsets of rational numbers to discover the real number system including irrational numbers. Students will use prior knowledge of exponents and square units as a measure of area to build models to represent square roots and approximate square root numbers to locate the numbers on a number line. Students will build on prior knowledge of ordering rational numbers by comparing and ordering all real numbers by their magnitude. Students will also define radical and square root for both rational and irrational numbers as a subset of the real number system, convert between standard decimal notation and scientific notation, order a set of real numbers to include both rational and irrational numbers in both mathematical and real-world contexts. Students will also examine right triangles more closely within this unit by using models to explain the Pythagorean Theorem, use Pythagorean Theorem and its converse to solve problems, and apply these understandings to determine the distance between two points on a coordinate plane. **At home connections:** • Have students *identify* and *compare* numbers seen in daily life (I.e. price per pound in grocery ads, price per gallon of gas, measurements within a recipe) and discuss which value is greater or least and explain how they know. • Have students identify and measure the sides of right triangles in their environment and use the Pythagorean Theorem to verify it is a right triangle.	
Concepts within Unit #1 **Link to TEKS**	**Success Criteria for this concept**
Establishing A Postive Mathematics Community TEKS: 8.1A, 8.1B, 8.1C, 8.1D, 8.1E, 8.1G, 8.1G	• Demonstrate active listening skills while sharing in the community circle. • Make positive and supportive connections with my peers. • Engage in circle dialogues using the circle guidelines. • Share my math ideas and strategies when given a problem during the number sense routine. • Explain what a Respect Agreement is and why it is created. • Work in a group to solve a mathematical problem. • Describe strategies that I can use to solve math problems. • Provide feedback to by peers using guidelines and a protocol.
Concept #1: Representing Real Numbers TEKS: 8.2A, 8.2B, 8.2C, 8.2D	• Define and understand a square root. • Determine the square root of a number. • Approximate the value of a square root using understanding of known perfect squares. • Approximate square roots and other irrational numbers using technology. • Define whole numbers, integers, and rational numbers. • Define irrational and real numbers. • Identify the difference between rational and irrational numbers. • Apply understanding of place value to compare and order real numbers. • Identify the location of real numbers, including the approximation of irrational numbers on a number line. • Order real numbers within mathematical and real world context. • Understand the change in place value when converting between scientific notation and decimal notation is determined by the exponent. • Convert between standard decimal notation and scientific notation.

Concept #2: Modeling Pythagorean Theorem
TEKS: 8.6C
	• Identify and define the parts of a right triangle.
	  ○ right angle
	  ○ legs

	○ hypotenuse • Understand that taking the side length to the second power produces the area of the square. • Explain the relationship between the squares formed by the legs and the hypotenuse. • Use a concrete manipulative or a pictorial representation to explain the Pythagorean Theorem.
Concept #3: Application of Pythagorean Theorem TEKS: 8.6C, 8.7C, 8.7D	• Justify whether three measurements form a right triangle using a variety of methods, including the converse of Pythagorean Theorem. • Calculate missing measurements of right triangles in mathematical and real-world situations using the Pythagorean Theorem, models and diagrams.
Unit 2: Transformations and Similar Figures Estimated Date Range: Sept. 16 – Oct. 6 and Oct. 12 – Oct. 26 Estimated Time Frame: 25 days	
Unit Overview: Students will apply their prior knowledge of coordinate grids: including the use of the *x* and *y*- axis & the four quadrants. Proportional relationships will be used to describe dilations. Students will generalize that the ratio of corresponding sides of similar figures are proportional, including a shape and its dilation, compare and contrast the attributes of a shape and its dilations on a coordinate plane, and explain the effect of a given positive rational scale factor applied to two-dimensional figures using algebraic representation. Students will explore transformational geometry concepts such as translations, reflections, rotations, and dilations and differentiate between transformations that preserve congruence and/or orientation and those that do not. Students will use models to show the effect of dilations to linear and area measurements. Students will continue to use geometry to solve problems using the Pythagorean Theorem to calculate the distance between two points on a shape's pre-image and/or image and use informal arguments to establish facts about the angle-angle criterion for similarity of triangles. The concepts in this unit include the following: Translations, Rotations and Reflections, Dilations and Effects of Dilation on Linear and Area Measurements. **At home connections:** • Have students research how algebraic representations of transformations are used in different jobs. • Have students measure an object in their environment (I.e. fireplace, porch, kitchen table, garden) and ask them how they think doubling/halving the measurements will affect the area and perimeter of the object.	
Concepts within Unit # 2 **Link to TEKS**	**Success Criteria for this concept**
Concept #1: Translations, Rotations, and Reflections TEKS: 8.10A, 8.10B, 8.10C	• Identify and define translations, rotations, and reflections. • Compare and contrast translations, rotations, and reflections. • Identify and define which transformations change congruence and orientation. • Model translations, rotations, and reflections using a coordinate grid. • Define the coordinates of a transformed image using a model. • Verbally explain the movement of a transformation. • Describe a transformation given an algebraic representation of a transformation. (I.e. *y+4* represents up four units). • Use an algebraic representation to model a transformed image.
Concept #2: Dilations TEKS: 8.3A, 8.3B, 8.3C, 8.7D, 8.8D, 8.10C	• Explain the relationship between the corresponding side lengths of a pre-image and an image. • Generalize the ratio/scale factor of corresponding sides of similar figures. • Explain the relationship between the corresponding angle measures in a pre-image and an image of dilated figures. (include angle-angle criterion). • Explain the multiplicative relationship when dilating a shape. • Identify the scale factor being multiplied to each coordinate pair of the pre-image in real world situations. • Create an algebraic representation to prove a dilation. • Use an algebraic representation to create a dilated image or list new coordinates.

Concept #3: Effects of Dilation TEKS: 8.10D	• Model the effect of dilation on linear and area measurements numerically and algebraically. • Analyze the effect on area after a shape has been dilated. • Analyze the effect on perimeter of a dilated shape. • Describe the effects of scale factor on perimeter/circumference of shapes. • Describe the effects of scale factor on the area of shapes.

Grading Period 2

Unit 2: Transformations and Similar Figures (Continued)
Estimated Date Range: Sept. 16 – Oct. 6 and Oct. 12 – Oct. 26
Estimated Time Frame: 25 days (Continued from grading period 1)

Unit 3: Foundations for Linear Functions
Estimated Date Range: Oct. 27 – Nov. 19 and Nov. 29– Dec. 17
Estimated Time Frame: 33 days

Unit Overview: In this unit, students will expand on their understanding of linear relationships and proportional relationships. Students will develop the concept of slope using similar triangles and relate this understanding to their understanding of rate, constant of proportionality and unit rate. Students will determine if a relation is a function from multiple representations. Students will write equations of linear in slope-intercept form from various representations.

At home connections:

- Have students describe real world examples of rate and slope. (speed, pitch of a roof, etc.)
- Have students determine linear situations in their environment (I.e. monthly expenses of a mortgage payment and electric bill) and discuss why it is a linear relationship.

Concepts within Unit # 3 **Link to TEKS**	**Success Criteria for this concept**
Concept #1: Determining a Function TEKS: 8.5G	• Define a function in terms of dependent and independent variables. • Determine if a relation is a function from a set of ordered pairs. • Determine if a relation is a function from a table. • Determine if a relation is a function from a mapping. • Determine if a relation is a function from a graph.
Concept #2: Developing and Finding Slope TEKS: 8.4A, 8.4B, 8.4C	• Explain why the rate of change between two points on a line is the same for any two points on a line using similarity. • Use a graph of a proportional relationship to show the slope is the unit rate. • Determine the rate of change or slope from a table. • Determine the rate of change or slope from a graph. • Determine the slope in mathematical problems and real-world situations. • Describe the meaning of the slope in real world context.

Concept #3: Proportional vs. Non-Proportional Linear Relationships
TEKS: 8.4C, 8.5A, 8.5B, 8.5E, 8.5F, 8.5H
	• Represent a proportional relationship using
	  ○ a table
	  ○ a graph
	  ○ an equation, $y = kx$
	• Represent a non-proportional relationship using
	  ○ a table
	  ○ a graph
	  ○ an equation, $y = mx + b$
	• Make connections between proportional and non-proportional relationships and situations represented by linear functions.
	• Determine if a relationship is proportional or non-proportional.
	• Determine the constant of variation in a direct variation problem.
	• Use the constant of variation in a direct variation problem to find the missing variable.
	• Use a proportion to solve a direct variation problem.
	• Make predictions using direct variation.

Concept #4: Linear Functions in Slope Intercept Form TEKS: 8.4C, 8.5F, 8.5I, 8.9A	• Given the slope and *y*-intercept of a linear function, write the equation in slope-intercept form. • Identify the slope and *y*-intercept from the graph of a linear function and write the equation in slope-intercept form. • Identify the slope and *y*-intercept from a table that represents a linear function and write the equation in slope intercept form. • Identify the slope and *y*-intercept from a verbal description that represents a linear function and write the equation in slope intercept form. • Make connections between different representations of a linear function. • Write the equation of a linear function that represents mathematical context. • Write the equation of a linear function that represent real world context. • Identify the point of intersection of two graphed equations. • Verify the *x*- and *y*- coordinate of the point of intersection satisfies both linear equations.

Grading Period 3

Unit 4: Making Predictions from Data
Estimated Date Range: Jan. 5 – Jan. 26
Estimated Time Frame: 15 days

Unit Overview: In this unit, students will take bivariate data from a real world situation and construct a scatterplot. Students will use the constructed scatterplot to analyze and determine relationship; this is done with or without trend lines. Students must understand that the purpose of modeling data is to look for trends or associations, from there we make predictions. Students will also look for variances in bivariate data in order to better understand and form conjectures between the samples. This is done through calculating absolute mean deviation and generating random samples.

At home connections:

- Have students collect data (I.e. age and weight of people, number of pets and number of kids in family, construct a scatterplot and determine if a graph models a linear relationship.

Concepts within Unit # 4 Link to TEKS	**Success Criteria for this concept**
Concept #1: Scatter Plots and Making Predictions TEKS: 8.5C, 8.5D, 8.11A	• Determine if a graph models linear or non-linear relationships. • Determine the type of correlation, i.e. positive, negative, or no correlation. • Construct scatterplots without technology from a real world context. • Construct scatterplots with technology from a real world context. • Given a scatterplot, draw an appropriate trend line. • Using multiple representations, create a scatterplot with and without technology and draw an appropriate trend line. • Use a trend line to make predictions about the independent variable. • Use a trend line to make predictions about the dependent variable. • Explain how a linear model is used to make predictions from the data.

Concept #2: Mean Absolute Deviation and Random Samples TEKS: 8.11B, 8.11C	• Generate random data using simulation such as dice, cards, etc.
	• Generate random data using random number generators and simulators.
	• Make predictions about populations using what I know about random samples.
	• Determine the mean absolute deviation given a set of data.
	• Use mean absolute deviation to:
	  ○ describe the spread of data
	  ○ compare the variability of data
	  ○ generate random samples with and without technology

Unit 5: Equations and Inequalities
Estimated Date Range: Jan. 27 – Feb. 23
Estimated Time Frame: 18 days

Unit Overview: In this unit, students will write real world situations from an equation or inequality as well as write equations and inequalities from verbal situations where there is a variable on both sides of the symbol. Students will also use concrete models, manipulatives, and inverse operations to solve equations with variables on both sides of the equal sign, represent solutions to equations and determine if a solution makes an equation true. In order to build conceptual understanding for solving equations it is essential that all the students have practice with writing equations, then representing and solving with models before solving using inverse operations.

At home connections:

- Have students explain real life situations in which using an equation would be helpful.
- Identify situations where an inequality could be applied, and discuss why.

Concepts within Unit # 5 Link to TEKS	Success Criteria for this concept
Concept #1: Writing Equations and Inequalities TEKS: 8.8A, 8.8B	• Understand and explain the similarities and differences between equations and inequalities in verbal and mathematical statements. • Identify which scenarios represent equations and which represent inequalities. • Write a real world scenario when given an equation or an inequality. • Represent real world scenarios using a one variable equation/inequality with variables on both sides.

Concept #2: Model and Solve Equations
TEKS: 8.8A, 8.8C, 8.9A
	• Model and write one variable equations in mathematical and real world context with variables on both sides of the equal sign using:
	  ○ concrete models
	  ○ pictorial models
	  ○ graphs
	  ○ algebraic methods
	• Solve one variable equations with variables on both sides of the equal sign using:
	  ○ concrete models
	  ○ pictorial models
	  ○ graphs
	  ○ algebraic methods
	• Explain the meaning of solutions to equations.
	• Evaluate reasonableness of solutions after solving for the unknown.

Unit 6: Geometric Applications of Equations
Estimated Date Range: Feb. 25 – March 11 and Mar. 21 – April 6
Estimated Time Frame: 25 days

Unit Overview: In this unit, students will apply knowledge from 7th grade as well as from unit 5 (Writing and Solving Equations) to geometric applications. Students will use prior knowledge on angle relationships to develop informal arguments, and write equations to calculate missing angle measurements. Students will also build their conceptual knowledge on surface area (lateral/total) and volume to better understand and apply formulas to real world problem situations.

At home connections:

- Have students identify objects within their environment that are rectangular prisms, triangular prisms, and cylinders and explain how to find the surface area and lateral area of the object.
- Have students research when it would be meaningful to find the volume of cones, cylinders, and spheres.

Concepts within Unit # 6 Link to TEKS	Success Criteria for this concept
Concept #1: Angles of Triangles TEKS: 8.8A, 8.8C, 8.8D	• Label remote interior angles and exterior angle when a line segment of a triangle is extended. • Explain the relationship between the remote interiors angles of a triangle and its exterior angle. • Model with an equation the relationship between the sum of the remote interior angles in a triangle and its exterior angle. • Find a missing value in a triangle using the relationship between the sum of the remote interior angles in a triangle and its exterior angle.
Concept #2: Parallel Lines TEKS: 8.8A, 8.8C, 8.8D	• Understand the vocabulary related to the angle relationships when a line (transversal) intersects a pair of parallel lines. • Label the angles formed when parallel lines are cut by a transversal (vertical angles, corresponding angles, alternate exterior angles, alternate interior angles, same side interior angles, same side exterior angles, and linear pairs).

	• Explain the angle relationships formed when parallel lines are cut by a transversal. • Write equations based on angles relationships of parallel lines and a transversal. • Solve for a missing angle given a diagram of parallel lines cut by a transversal.
Concept #3: Surface Area TEKS: 8.7B, 8.8A, 8.8C	• Use a net that represents a prism or cylinder in a given situation, to assist with making connections between the lateral and total surface areas. • Explain the connections between the area of a net and the total and lateral surface area formulas of a prism/cylinder. • Understand which face(s) are bases and which measurements are height and slant height. • Understand how the surface area formula connects the height of the figure and the perimeter/circumference of the base shape is used to calculate the surface area. • Solve for lateral and total surface area in real world contexts involving rectangular prisms, triangular prisms, and cylinders. • Describe similarities and differences between lateral and total surface area in mathematical and real world applications. • Justify and explain the reasonableness of a solution (measurement of a dimension, lateral or total surface area) as it relates to the context within a real-world situation.
Concept #4: Volume TEKS: 8.6A, 8.6B, 8.7A, 8.8A, 8.8C	• Explain the connections between the dimensions of the net and its 3D figure and how they are used to calculate the volume. • Understand the relationship between volume of a cylinder and cone. • Explain the connections between the formulas for calculating the volume of cones and cylinders. • Solve for volume of cones, cylinders, and spheres in a real world situation. • Determine a missing measurement of a dimension given the volume. • Describe similarities and differences between volume formulas. • Justify and explain the reasonableness of a volume solution as it relates to the context within a real-world situation.

Grading Period 4

Unit 6: Geometric Applications of Equations (continued)
Estimated Date Range: Feb. 25 – March 11 and Mar. 21 – April 6
Estimated Time Frame: 25 days (Continued from Grading Period 3)

Unit 7: Financial Literacy
Estimated Date Range: April 7 – April 26
Estimated Time Frame: 12 days

Unit Overview: In this unit, students will learn the basic concepts of financial literacy in regards to spending and the importance of saving for the future. Students will use technology to solve problems comparing the interest rate and loan length, and calculate the cost of repaying a loan. Students will formulate strategies for making good financial decisions by investigating the different types of credit, loans, and the costs associated with borrowing money and various methods of payment. Students will conclude the unit by identifying situations that represent financially responsible decisions, and estimate the costs of attending various education institutions.

At home connections:

- Have students choose a vacation destination and research the total cost for 5 days (travel, lodging, food, activities). Once the total cost has been determined and a date has been decided, have them devise a savings plan involving interest to save for the vacation.
- Have students choose a car online that they would like to purchase. Have them determine the total cost of the car if they were to finance the car with a down payment.

Concepts within Unit # 7 **Link to TEKS**	**Success Criteria for this concept**
Concept #1: Saving for the Future TEKS: 8.12C, 8.12D	• Investigate various situations of spending habits. • Explain ways consumers spend/save money. • Explore the various types of investments and various variables when saving money. • Use online banking calculator to compare earnings on savings. • Calculate simple/compound interest in real world financial situations.
Concept #2: Borrowing Money TEKS: 8.8C, 8.12A, 8.12B	• Explore various options consumers have to borrow money. • Investigate and compare various types of interest rates consumers can pay lenders when repaying borrowed money. • Solve real world financial problems comparing how interest rates and loan lengths affect the total cost of borrowed money. • Use an online banking calculator to compare how interest rates and loan lengths affect the total cost of borrowed money.
Concept #3: Methods of Payment TEKS: 8.12E	• Create a chart of the characteristics of various methods of payment. • Investigate and discuss the advantages and disadvantages of using various methods of payment. • Participate in a discussion on how consumers pay for needs/wants. • Solve real world problems on methods of payment.
Concept #4: Financially Responsible Decisions TEKS: 8.12F	• Identify and analyze characteristics of financially responsible and irresponsible decisions. • Identify and analyze real world financial scenarios.
Concept #5: Devise a College Savings Plan TEKS: 8.8A, 8.12G	• Research the related costs to attend college. • Estimate the amount for 2 or 4 years of college. • Devise a realistic plan on how to save for the first year of college • Research earnings for future career.

	• Research colleges/schools tuition and years attended to obtain appropriate degree. • Compare income to monthly student loan payments to final pay off amount/time.
Unit 8: Applications for Algebraic Reasoning Estimated Date Range: April 27 – May 26 Estimated Time Frame: 22 days	
Unit Overview: In this unit, students will review a combination of concepts taught earlier this year (Linear Functions) and concepts taught in 7th grade (write, model and solve equations/inequalities). Students will refine their understanding of linear relationships and proportional relationships. Students will determine if a relation is a function from multiple representations. Students will write equations of linear in slope-intercept form from various representations. Students will also use concrete models, manipulatives, and inverse operations to solve equations with variables on both sides of the equal sign as well as inequalities, represent solutions to equations/inequalities and determine if a solution makes an equation/inequality true. Use a pre-assessment to determine the need for Tier 1, Tier 2, or Tier 3 intervention for both concepts in this unit. **At home connections:** • Have students describe real world examples of rate and slope. (speed, pitch of a roof, etc.) • Have students determine linear situations in their environment (I.e. monthly expenses of a mortgage payment and electric bill) and discuss why it is a linear relationship. • Have students explain real life situations in which using an equation would be helpful. • Identify situations where an inequality could be applied, and discuss why.	
Concepts within Unit # 8 **Link to TEKS**	**Success Criteria for this concept**

Concept #1: Linear Functions
TEKS: 8.4C, 8.5F, 8.5G, 8.5I, 8.9A
	• Draw similar right triangles to show the proportional relationship of any two points on a line (slope).
	• Prove that a linear relationship is non-proportional when the y-intercept is not zero.
	• Prove that a linear relationship is proportional when the y-intercept is zero.
	• Determine if a representation is a function or not a function.
	• Define a function as a relation in which each value from the set of independent quantities is associated with exactly one value from the set of dependent qualities.
	• Write equations in the form $y = mx+b$ using a
	  ○ table
	  ○ graph
	  ○ numerical description
	  ○ verbal description
	• Write an equation in the form of $y = mx+b$ from real world problems.
	• Determine slope and *y*-intercept from multiple representation in real world situations.

Concept #2: Write, Model, and Solve Equations and Inequalities TEKS: 7.10A, 7.10B, 7.11A, 7.11B, 8.8A, 8.8C, 8.9A	• Understand and explain the similarities and differences between equations and inequalities in verbal and mathematical statements. • Identify which scenarios represent equations. • Identify which scenarios represent inequalities. • Represent real world scenarios using a one variable equation/inequality with variables on both sides. • Model and write one variable equations with variables on both sides of the equal sign using: ○ concrete and pictorial models

	○ inverse operations ○ real world scenarios • Solve one variable equations/inequalities with variables on both sides of the equal sign using: ○ concrete and pictorial models ○ inverse operations ○ real world scenarios ○ graphical representations
Concept #3: Coding with the TI Nspire TEKS: TA TEKS 4B and Math Process Standards	• Follow steps to understand the Program Editor function of my calculator. • Use arguments to give unknown variables a value. • Design a program and a function that appear to do the same thing. • Describe the difference between a program and a function. • Write my own program.

Glossary of Curriculum Components

Overview– The content in this document provides an overview of the pacing and concepts covered in a subject for the year.
TEKS – Texas Essential Knowledge and Skills (TEKS) are the state standards for what students should know and be able to do.
Unit Overview – The unit overview provides a brief description of the concepts covered in each unit.
Concept – A subtopic of the main topic of the unit.
Success Criteria—a description of what it looks like to be successful in this concept.

Parent Resources

The following resources provide parents with ideas to support students' understanding. For sites that are password protected, your child will receive log-in information through their campus.

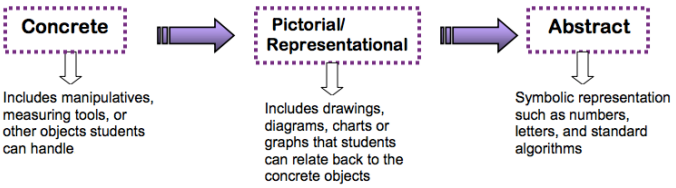
Resource	How it supports parent and students
Texas Go Math! Grade 8	This is the state adopted textbook for middle school math. Click on the link for directions on accessing the textbook.
Didax Virtual Manipulatives Math Learning Center Math Apps	These online resources provide access to virtual manipulatives.
Parent Resources from youcubed.org	This resource from youcubed.org includes articles for parents on ways to support their students in learning and understanding mathematics.
Student Resources from youcubed.org	This resource from youcubed.org includes videos concerning growth mindset in mathematics.
Math: Why Doesn't Yours Look Like Mine?	This resource provides an explanation of why math looks different now as opposed to how parents learned mathematics and how to support students in learning mathematics.

Supplemental Resource and Tool Designation:

- The TI Nspire CX calculator is a standardized technology integration tool used for Mathematics and Science in FBISD.

Instructional Model

The structures, guidelines or model in which students engage in a particular content that ensures understanding of that content.



The instructional model for mathematics is the Concrete-Representational-Abstract Model (CRA).
The CRA model allows students to access mathematics content first through a concrete approach ("doing" stage) then representational ("seeing" stage) and then finally abstract ("symbolic" stage). The CRA model allows students to conceptually develop concepts so they have a deeper understanding of the mathematics and are able to apply and transfer their understanding across concepts and contents. The CRA model is implemented in grades K-12 in FBISD.

Math Workshop:

During math instruction in grades K-8 in FBISD, we follow the Math Workshop structures. Instruction during a math class follows one of the three structures: Task and Share, Mini Lesson, Guided Math and Learning Stations, and Guided Math and Learning Stations. The structure that is used each day is determined by the content covered as well as student need.

<table>
<tr><th>Task and Share</th><th colspan="2">Mini Lesson, Guided Math and Learning Stations</th><th colspan="2">Guided Math and Learning Stations</th></tr>
<tr><td>Number Sense Routine</td><td colspan="2">Number Sense Routine</td><td colspan="2">Number Sense Routine</td></tr>
<tr><td rowspan="2">Math Task</td><td colspan="2">Mini Lesson</td><td rowspan="2">Guided Math</td><td rowspan="2">Learning Stations</td></tr>
<tr><td>Guided Math</td><td>Learning Stations</td></tr>
<tr><td>Task Share and Student Reflective Closure</td><td colspan="2">Student Reflective Closure</td><td colspan="2">Student Reflective Closure</td></tr>
</table>

Number Sense Routine – An engaging accessible, purposeful routine to begin math class that promotes a community of positive mathematics discussion and thinking.

Math Task – A problem-solving task that students work on in small groups. The teacher monitors and probes student thinking through questions. The task should have multiple entry points, allowing all students to have access to the problem.

Task Share with Student Reflective Closure – Students come together as a whole class and discuss the various strategies they used to solve a rich mathematical task. Students ask questions, clarify their thinking, modify their work, and add to their collection of strategies.

Mini Lesson – A well-planned whole group lesson focused on the day's learning intention and accessible to all levels of learners.

Guided Math – Small group instruction that allows the teacher to support and learn more about students' understandings and misconceptions. Can include intervention, more on-level support, or enrichment.

Learning Stations – Activity in which students engage in meaningful mathematics and are provided with purposeful choices. Could include individual, partner or group tasks.

Student Reflective Closure – A deliberate and meaningful time for students to reflect on what they have learned and experienced during a math task, at activities in learning stations, or in a guided math group.