# Math Grade 7 Overview 2019-2020

This document is designed to provide parents/guardians/community an overview of the curriculum taught in the FBISD classroom. Included, is an overview of the Mathematics Instructional Model and Pacing, TEKS, Unit Overview, Big Ideas, Essential Questions, and Concepts for each unit.

## Definitions:

**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.

**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.

**Unit Overview** – The unit overview provides a brief description of the concepts covered in each unit.

**Big Ideas and Essential Questions** - Big ideas create connections in learning. They anchor all the smaller isolated, facts together in a unit. Essential questions (questions that allow students to go deep in thinking) should answer the big ideas. Students should not be able to answer Essential Questions in one sentence or less. Big ideas should be the underlying concepts, themes, or issues that bring meaning to content.

**Concept** – A subtopic of the main topic of the unit

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

## Parent Supports:

The following resources provide parents with ideas to support students in mathematical understanding

- [Advice for Parents: Helping Children with Math](#)
- [How Math Should be Taught](#)
- [The Most Important Mathematical Habit of Mind](#)
- [Math: Why Doesn’t Yours Look Like Mine?](#)
**Instructional Model:**

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>
<thead>
<tr>
<th>Task and Share</th>
<th>Mini Lesson, Guided Math and Learning Stations</th>
<th>Guided Math and Learning Stations</th>
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<tbody>
<tr>
<td>Number Sense Routine</td>
<td>Number Sense Routine</td>
<td>Number Sense Routine</td>
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<tr>
<td><strong>Math Task</strong></td>
<td><strong>Mini Lesson</strong></td>
<td><strong>Guided Math</strong></td>
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<td></td>
<td>Guided Math</td>
<td>Learning Stations</td>
</tr>
<tr>
<td><strong>Task Share and Student Reflective Closure</strong></td>
<td>Student Reflective Closure</td>
<td>Student Reflective Closure</td>
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</tbody>
</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 for 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’ve learned and experienced during a math task, at activities in learning stations, or in a guided math group.
Adopted Resources:

Middle School: https://www.fortbendisd.com/Page/93918

Supplemental Resource and Tool Designation

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

Mathematical Process Standards:

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

7.1A Apply mathematics to problems arising in everyday life, society, and the workplace
7.1B 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
7.1C 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
7.1D Communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate
7.1E Create and use representations to organize, record, and communicate mathematical ideas
7.1F Analyze mathematical relationships to connect and communicate mathematical ideas
7.1G Display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication

Grading Period 1

Week of Inspirational Maths
Estimated Date Range: Aug. 14 – Aug. 20

Unit Overview: This unit is a set of 5 lessons to begin the school year. Lessons focus on growth mindset and how we learn mathematics.

<table>
<thead>
<tr>
<th>Themes for the Week</th>
<th>TEKS Link to Math TEKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>The themes for the week promote important mathematical ideas such as:</td>
<td>7.1A, 7.1B, 7.1C, 7.1D, 7.1E, 7.1F, 7.1G</td>
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<tr>
<td>• learning from mistakes</td>
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<td>• doing mathematics visually</td>
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<tr>
<td>• productive struggle</td>
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<tr>
<td>• working together</td>
<td></td>
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<tr>
<td>• communicating about mathematics</td>
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</table>
## Unit 1: Rational Number Operations

**Estimated Date Range:** Aug. 21 – Sept. 16

### Unit Overview:
In this unit, students will use visual representations to organize and display the relationship of the sets and subsets of rational numbers, which include natural numbers, whole numbers, integers and rational numbers. Understanding the relationships of sets and subsets of rational numbers assists in building the foundation of algebraic concepts students will need for eighth grade math. Prior to grade seven, students performed addition, subtraction, multiplication, and division with nonnegative rational numbers including whole numbers, positive fractions, and positive decimals. Students also modeled everyday situations with integers. Students will continue to add, subtract, multiply, and divide, but operations now include negative and positive rational numbers. Students will also fluently perform all operations of positive and negative rational numbers including integers, decimals, fractions and percentages converted to equivalent decimals or fractions.

### Big Ideas:
- Visual representations can be used to describe relationships between sets and subsets of numbers.
- Mathematical operations and strategies may be used to represent and solve a variety of problem situations in everyday life.
- Rational numbers are a natural extension of the way that we apply properties and operations to numbers.
- Solving problems involving addition, subtraction, multiplication and division fluently requires the efficient, accurate and flexible use of strategies and method.

### Essential Questions
- How representations be use to describe how numbers can belong to the same set of numbers, but not necessarily the same subset of numbers?
- What procedures can be used to solve problems involving rational numbers?
- Why are rational numbers significant in solving problems?
- How can we apply the properties of operations to make solving the problem more efficient?

<table>
<thead>
<tr>
<th>Concepts within Unit #1</th>
<th>TEKS</th>
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</thead>
<tbody>
<tr>
<td>Concept #1: Sets and Subsets</td>
<td>7.2</td>
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<tr>
<td>Concept #2: Rational Number Operations</td>
<td>7.3A, 7.3B</td>
</tr>
</tbody>
</table>

## Unit 2: Proportional Relationships

**Estimated Date Range:** Sept. 17 – Oct. 10

### Unit Overview:
In this unit, students will extend and apply their previous knowledge of ratios, rates, and percentage (single-step) problems from 6th grade to multi-step problems in 7th grade. Students will learn multiple strategies for solving proportion problems, such as equivalent ratios, unit rate, and ratio tables. Students will explain or show their thinking using representations and verify that their answers for reasonableness. In addition, students will also use models to identify the parts of the problem and how the values are related. Students will extend their understanding of proportional relationships to solving percentage problems involving sales tax, markups, markdowns, simple interest, commissions, fees, percentage increase and decrease. Students will also extend their understanding of proportional relationships to converting units within customary and metric systems.

### Big Ideas:
- Problems involving ratios, rates, and percentage can be solved using various methods.
- Ratios, rates, and percentage compare two quantities with a multiplicative relationship. These relationships help us to make comparisons and predictions.
- Proportional reasoning can be used to describe and solve problems in everyday life.

### Essential Questions
- How can models be used to solve problems involving ratios, rates and percentage?
- How is a ratio, rate, or percent used to compare two quantities or values?
How can proportional reasoning be used to make predictions and comparisons in problem situations?

### Concepts within Unit #2

| Concept #1: Application of Percentages | 7.3B, 7.4D, 7.13A, 7.13E, 7.13F |
| Concept #2: Calculating Unit Rates | 7.4B, 7.4E |

### Grading Period 2

**Unit 3: Linear Relationships**

**Estimated Date Range:** Oct. 15 – Nov. 5

**Unit Overview:** In this unit, students will use bivariate data to examine constant rates of changes given pictorial, tabular, verbal, numeric, graphical, and algebraic representations. Students will extend their understandings of the constant of proportionality. Students will be formally introduced to the slope intercept form of equations, $y=mx+b$, to represent linear relationships. Students will learn to relate the constant rate of change to $m$, and $y$-coordinate, when the $x$-coordinate is zero, to $b$ in equations that simplify to the form of $y=mx+b$. Students will represent linear relationships using verbal descriptions, tables, graphs and equations that simplify to the form $y=mx+b$. Students may encounter various representations such as verbal descriptions, tables, graphs, and equations in the form $y = mx + b$ to describe algebraic relationships. Equations should include rational number coefficients and constants.

**Big Ideas:**

- Linear relationships can be represented with verbal descriptions, graphs, equations, and tables that simplify to the form or $y = mx + b$.
- The constant rate of change describes the relationship between two different quantities.
- The constant of proportionality is equivalent to the constant rate of change $m$, in the linear relationship, $y=mx+b$, when $b=0$.

**Essential Questions**

- What are the characteristics of a linear relationship?
- How does the rate which the output changes compare to the rate at which the input changes?
- What relationship exists between the constant of proportionality and the constant rate of change?

### Concepts within Unit #3 (Grading Period 2)

| Concept #1: Application of Percentages | 7.3B, 7.4D, 7.13A, 7.13E, 7.13F |
| Concept #2: Calculating Unit Rates | 7.4B, 7.4E |

**Unit 4: Equations and Inequalities**

**Estimated Date Range:** Nov. 6 – Nov. 22 and Dec. 2 – Dec. 19

**Note:** Includes 7 days for Semester Exams and review

**Unit Overview:** In this unit, students will write one-step equations, one-step inequalities, and two-step equations from real world situations. Students will also use concrete models, manipulatives, and inverse operations to solve two step equations and inequalities as well as represent solutions to equations and inequalities and determine if a solution makes an equation or inequality true. In the previous unit, students wrote one variable, two-step equations from verbal descriptions using the slope intercept form, $y=mx+b$, to represent linear relationships. In this unit, students will extend their understanding of linear relationships by solving equations by preserving equivalence throughout the steps.

**Big Ideas:**

- A solution to an equation or inequality represents a value(s) that makes the statement(s) true in mathematical and real-world situations.
- Equations and inequalities can be modeled and solved using concrete, pictorial, and algebraic representations.
- The process to solve an equation must preserve equivalence. Equivalence can be preserved using inverse operations with models and algebraically.
Essential Questions
- What does the solution to an equation or inequality mean? How can you determine a solution for an equation or inequality?
- How are negative values represented with concrete and pictorial models?
- How do you preserve equality when solving an equation or inequality?

Concepts within Unit #4 | TEKS
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Concept #1: Writing Equations and Inequalities | 7.10A, 7.10C
Concept #2: Model and Solve Equations | 7.10B, 7.11A
Concept #3: Model and Solve Inequalities | 7.10B, 7.11A
Concept #4: Application of Equations and Inequalities | 7.11A, 7.11B, 7.11C

Grading Period 3
Unit 5: Similarity
Estimated Date Range: Jan. 7 – Jan. 23

Unit Overview: In this unit, students will name similar figures with corresponding vertices and similarity symbol as well as write an extended proportion of corresponding sides of a similar figure using the endpoints and lengths of the sides. Students will discover the relationship of corresponding angles and corresponding sides of similar figures, write generalizations, and determine if figures are similar using proportional reasoning. Students will determine missing measurements from similar figures as well as solve real world problems involving similar figures including scale drawings.

Big Ideas:
- Proportional reasoning can be used to describe and solve problems in everyday life.

Essential Questions:
- How do you determine if two figures are similar?

Concepts within Unit #5 | TEKS
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Concept #1: Attributes of Similar Figures | 7.5A
Concept #2: Similar Figures | 7.5C

Unit 6: Circumference & Area of 2-D Figures
Estimated Date Range: Jan. 24 – Feb. 11

Unit Overview: In this unit, students will discover Pi and how it is the ratio of the circumference to the diameter. Students learn to represent the relationship between the parts of the circle and circumference with pictures, graphs, and algebraically. Based on the ratio of circumference to diameter, students will then identify how to calculate circumference of a circle when provided with the radius or the diameter. Students will explore and determine how to calculate area of circles based on what they know about the area of a parallelogram by using manipulatives and technology to make the connections. Students will need to be able to apply the knowledge of area and circumference to different real world situations. In this unit, students will use their prior knowledge of area of polygons and circles to determine area of composite figures.

Big Ideas:
- Geometric attributes and their measures can be used to describe figures and their relationships.
- Mathematical operations and strategies may be used to represent and solve a variety of problem situations involving area and volume.

Essential Questions
- How are the parts of a circle related to circumference and area of a circle?
- How are area and volume problems solved?
Concepts within Unit #6

Concept #1: Circumference and Area of Circles  
7.5B, 7.8C, 7.9B

Concept #2: Area of Composite Figures  
7.9B, 7.9C

Unit 7: Volume & Surface Area of 3-D Figures  
Estimated Date Range: Feb. 12 – Mar. 6

Unit Overview: In this unit, students will make the bridge from 2-D shapes into 3-D shapes from calculating composite area to calculating surface area using nets. Students will only focus on rectangular prisms and pyramids and triangular prisms and pyramids. Students will determine the net of these figures when given a 3-D picture or model. They will identify the location of the dimensions on the shapes net when the prism or pyramid is a 3-D drawing. Students will learn to calculate the lateral and total surface area of the figures as well as understand and explain the difference between the two, and apply it to real world scenarios. Students will learn how the volume formula is derived. Students will also gain a better understanding of how the volume formula relates to prisms and pyramids with congruent bases and heights. Students will apply their understanding of volume to solve real-world application problems involving volume of those four figures.

Big Ideas:
- Geometric Attributes and their measures can be used to describe figures and their relationships.
- Mathematical operations and strategies may be used to represent and solve a variety of problem situations dealing with area and volume.

Essential Questions
- How do geometric relationships and the application of measurements help us to solve authentic problems in life?
- Does a constant relationship exist between the dimensions and volumes of different shapes? If so, why? If not, why not?

Concepts within Unit #7

Concept #1: Surface Area  
7.9C, 7.9D

Concept #2: Volume of 3-D Figures  
7.8A, 7.8B, 7.9A

Grading Period 4

Unit 8: Data & Probability  
Estimated Date Range: Mar. 16 – April 9
Note: Includes 1 day for state testing

Unit Overview: In this unit, students will create sample spaces using tree diagrams and lists as well as using manipulatives and technology to understand probability of outcomes in simple and compound events. Students will identify a probability of simple event and its complement and describe the relationships between the two. Students will explore and understand the difference between theoretical probability and experimental probability for various events. Students will also create simulations of different events with or without technology to make predictions and compare different events. Students will make predictions with simple and compound events based on experimental data and/or theoretical probability.

Big Ideas:
- Models may be used to simulate real world events, enabling us to make predictions.

Essential Questions
- How can you make predictions for an event?

Concepts within Unit #8

Concept #1: Foundations of Probability  
7.6A, 7.6B

Concept #2: Determining Probability of Simple and Compound Events  
7.6A, 7.6B, 7.6E, 7.6I

Concept #3: Making Predictions with Simple and Compound Events  
7.6B, 7.6C, 7.6D, 7.6H
# Unit 9: Data & Statistics

**Estimated Date Range:** April 14 – April 30

**Unit Overview:** In this unit, students will use proportional reasoning to compare data and solve data problems represented in bar graphs, dot plots, and circle graphs. Students will use part-to-part and part-to-whole comparisons and equivalencies to solve problems involving data from bar graphs, dot plots, and circle graphs. Students will compare the shape, center and spread of data using comparative plots, measures of central tendency and distribution of the data. Students will learn what a random sample is and be able to determine whether a sample is valid. Students will also use data to make connections between random samples and populations, make inferences from random samples of data using proportional reasoning. Students will also compare two populations based on the data in random samples to make inferences about similarities and differences.

**Big Ideas:**
- Statistical data can be represented and described in various ways.
- Proportional reasoning can be used to make predictions and solve problems.

**Essential Questions**
- How can you analyze and compare data?
- How can proportional reasoning be used to make predictions using data?

## Concepts within Unit #9

<table>
<thead>
<tr>
<th>Concept</th>
<th>Description</th>
<th>TEKS</th>
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</thead>
<tbody>
<tr>
<td>Concept #1: Analyzing Data in Bar Graphs, Dot Plots, and Circle Graphs</td>
<td>7.6G</td>
<td></td>
</tr>
<tr>
<td>Concept #2: Comparing Two Sets of Data</td>
<td>7.12A</td>
<td></td>
</tr>
<tr>
<td>Concept #3: Making Inferences with Data</td>
<td>7.12B, 7.12C</td>
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</tbody>
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# Unit 10: Financial Literacy

**Estimated Date Range:** May 1 – May 28

**Note:** Includes 2 days for state testing and 7 days for semester exams and review

**Unit Overview:** In this unit, students will differentiate between taxable and non-taxable items as well as learn how to calculate sales tax. Students will use a pay stub to calculate income tax, payroll tax (Medicare and social security), paycheck withholdings, and net income. Students will utilize net income to calculate a budget, and categorize expenses. Students will also identify fixed and variable expenses as well as target salaries and occupations that support them. Students will analyze assets and liabilities to identify net worth. Students will compare simple and compound interest and analyze total interest earned.

**Big Ideas:**
- Developing an economic way of thinking and problem solving is useful in one's life as a knowledgeable consumer and investor.

**Essential Questions**
- Why do we study financial literacy?

## Concepts within Unit #10

<table>
<thead>
<tr>
<th>Concept</th>
<th>Description</th>
<th>TEKS</th>
</tr>
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<tbody>
<tr>
<td>Concept #1: Tax</td>
<td>7.13A, 7.13F</td>
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</tr>
<tr>
<td>Concept #2: Personal Budget and Net Worth</td>
<td>7.13B, 7.13C, 7.13D</td>
<td></td>
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<tr>
<td>Concept #3: Interest</td>
<td>7.13E</td>
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</table>