# Math Grade 6 Pre-AP 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>
</tr>
</thead>
<tbody>
<tr>
<td>Number Sense Routine</td>
<td>Number Sense Routine</td>
<td>Number Sense Routine</td>
</tr>
<tr>
<td>Math Task</td>
<td>Mini Lesson</td>
<td>Guided Math Learning Stations</td>
</tr>
<tr>
<td>Task Share and Student Reflective Closure</td>
<td>Student Reflective Closure</td>
<td>Student Reflective Closure</td>
</tr>
</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](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:

6.1A Apply mathematics to problems arising in everyday life, society, and the workplace
6.1B 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
6.1C 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
6.1D Communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate
6.1E Create and use representations to organize, record, and communicate mathematical ideas
6.1F Analyze mathematical relationships to connect and communicate mathematical ideas
6.1G 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>6.1A, 6.1B, 6.1C, 6.1D, 6.1E, 6.1F, 6.1G</td>
</tr>
<tr>
<td>learning from mistakes</td>
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<tr>
<td>doing mathematics visually</td>
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<tr>
<td>productive struggle</td>
<td></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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</tbody>
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**Unit 1: Adding and Subtracting Rational Numbers**
Estimated Date Range: Aug. 21 – Sept. 26
Unit Overview: In this unit, students will learn the meaning of integers, absolute value and rational numbers as well as how to classify, compare and order rational numbers. Students will learn how to add and subtract integers and then rational numbers. Students will spend significant time modeling the operations in order to develop a conceptual understanding of the operations and how/why they work the way they do when positive and negative numbers are involved. Instruction will include contextual, real-world problems that allow students to reason through their work and justify the reasonableness of their solutions.

Big Ideas:
- Every whole number has an opposite, both those numbers are an equal distance from zero, and this distance is known as the absolute value.
- Rational numbers can be classified into categories. The values of rational numbers can be compared with other rational numbers.
- Using a variety of algorithms allows for developing fluency with operations.

Essential Questions:
- What is an integer and how does it relate to absolute value?
- How can different types of numbers be categorized?
- What patterns emerge when adding and subtracting integers and rational numbers?

<table>
<thead>
<tr>
<th>Concepts within Unit #1</th>
<th>TEKS (Link to Math TEKS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concept #1: Integers and Absolute Value</td>
<td>6.2B, 6.2C, 6.2D</td>
</tr>
<tr>
<td>Concept #2: Understanding Rational Numbers</td>
<td>6.2A, 6.2B, 6.2C, 6.2D, 7.2A</td>
</tr>
<tr>
<td>Concept #3: Add and Subtract Integers</td>
<td>6.2B, 6.3C, 6.3D, 6.7A, 6.7C, 6.7D, 7.3A, 7.3B</td>
</tr>
<tr>
<td>Concept #4: Adding and Subtracting Rational Numbers</td>
<td>6.2B, 6.2C, 6.3C, 6.3D, 6.7A, 6.7C, 6.7D, 7.3A, 7.3B</td>
</tr>
</tbody>
</table>

Unit 2: Multiplying and Dividing Rational Numbers
Estimated Date Range: Sept. 30 – Oct. 10 and Oct. 15 – Oct. 29

Unit Overview: In this unit, students will discover algorithms for multiplying and dividing rational numbers (integers, fractions and decimals) through exploration and modeling. Students will come to understand that multiplying any number by a positive fraction less than one will result in a smaller product than the original factor. Students will also learn that dividing any number by a positive fraction less than one will result in a quotient larger than the dividend. In the Pre-AP math class, students will extend their understandings of integer operations to fractions and decimals and will work with both positive and negative fractions and decimals. The concepts in this unit include the following: Multiplying and Dividing Integers, Multiplying Rational Numbers, and Dividing Rational Numbers.

Big Ideas:
- Using a variety of algorithms allows for developing fluency with operations.

Essential Questions:
- What patterns emerge when multiplying and dividing integers and rational numbers?

<table>
<thead>
<tr>
<th>Concepts within Unit #2</th>
<th>TEKS (Link to Math TEKS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concept #1: Multiplying and Dividing Integers</td>
<td>6.2B, 6.2C, 6.2E, 6.3C, 6.3D, 6.7A, 7.3A, 7.3B</td>
</tr>
<tr>
<td>Concept #2: Multiplying Positive Rational Numbers</td>
<td>6.3B, 6.3E, 6.4G, 6.7A, 6.7D, 7.3A, 7.3B</td>
</tr>
<tr>
<td>Concept #3: Dividing Positive Rational Numbers</td>
<td>6.3A, 6.3E, 6.7A, 6.7D, 7.3A, 7.3B</td>
</tr>
</tbody>
</table>

Grading Period 2
Unit 3: Proportional Reasoning  
Estimated Date Range: Oct. 30 – Nov. 22 and Dec. 2 – Dec. 19  
Note: Includes 7 days for Semester Exams and review  

Unit Overview: In this unit, students will develop proportional reasoning skills as they relate to fractions, decimals, and percents. Students will represent percents with concrete models and pictorial models, such as 10x10 grids, strip diagrams and number lines that will aid them in developing a proportional understanding of equivalent fractions, decimals, and percents. Students will also use their proportional understanding to find either the part, the whole, or the percent, given the other two values to aid in solving. The concepts in this unit include the following: Equivalent Forms of Fractions, Decimals, and Percents, Percent Application and Application of Ratios, Rates, and Proportions.

Big Ideas:  
- Flexibility in representation empowers problem solving.  
- Proportional reasoning can be used to make predictions and solve problems.

Essential Questions:  
- How can we represent part-to-whole relationships?  
- Why would we want to represent those relationships in different ways?  
- Why would you convert between a decimal, a fraction, and/or a percent?  
- How does flexibility in representation empower problem solving?  
- How is a percent used to compare two quantities or values?  
- When would it be appropriate to use decimals, fractions, and percents to solve a problem?

Concepts within Unit #3 | TEKS (Link to Math TEKS)  
--- | ---  
Concept #1: Equivalent forms of Fractions, Decimals and Percents | 6.2E, 6.4E, 6.4F, 6.4G, 6.5C  
Concept #2: Percent Application | 6.5B, 7.3A, 7.3B, 7.4D, 7.13A, 7.13E, 7.13F  
Concept #3: Ratios, Rates, & Proportions | 6.4A, 6.4B, 6.4C, 6.4D, 6.4E, 6.4H, 7.3B, 7.4B, 7.4D, 7.4E

Unit 4: Multiple Representations  
Estimated Date Range: Jan. 7 – Jan. 30  

Unit Overview: In this unit, students need to understand that there are multiple ways to represent a problem. Students will extend their knowledge of graphing ordered pairs \((x, y)\) on the coordinate plane in quadrant 1, where \(x\) and \(y\) are positive whole numbers, to graphing ordered pairs in all four quadrants where \(x\) and \(y\) are rational numbers. Students will identify the independent and dependent variables from tables, graphs, and equations and explain their meanings in context of real-world situations. Students will explore the similarities and differences between additive \((y = ax + b)\) and multiplicative \((y = ax)\) relationships and apply this knowledge to represent linear relationships using tables, graphs, equations, and verbal descriptions.

Big Ideas:  
- The set of real numbers is infinite, and each real number can be associated with a unique point on the number line.  
- Mathematical rules (relations) can be used to assign members of one set to members of another set. A special rule (function) assigns each member of one set to a unique member of another set.  
- Flexibility in representation empowers problem solving.

Essential Questions:  
- How can points be graphed (and located) on a coordinate plane?  
- What is the relationship between one set of numbers and another set of numbers?  
- How can situations that represent a linear relationship be represented?

Concepts within Unit #4 | TEKS (Link to Math TEKS)  
--- | ---  
Concept #1: Graphing on the Coordinate Plane | 6.6A, 6.6C, 6.11A
### Unit 5: Equations and Inequalities

**Estimated Date Range:** Jan. 31 – Feb. 28

**Unit Overview:** In this unit, students will use the properties of operations and order of operations to generate equivalent expressions. Students will write real world situations from both one-step and two-step equations, as well as write one-step and one-variable, two-step equations, and inequalities from verbal situations. Students will use concrete models, manipulatives, and inverse operations to solve one-and two-step equations and inequalities, represent solutions to equations and inequalities, and determine if a solution makes an equation or inequality 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. In the Multiple Representations unit, students wrote one-step and one-variable, two-step equations from verbal descriptions, therefore embed real-life problems when solving equations. Use a pre-assessment to determine the need for Tier 2 or Tier 3 intervention for solving one-variable, one-step equations (prerequisite skill). Tier 1 instruction should focus on modeling and solving one-step and one-variable, two step equations and inequalities (including Geometry concepts).

**Big Ideas:**
- An expression has infinitely many equivalent expressions.
- Equations and inequalities can be used to represent concrete and real-world situations.
- Equations and inequalities can be modeled and solved using concrete, pictorial, and algebraic models.
- The process to solve an equation must preserve equivalence. Equivalence can be preserved using inverse operations with models and algebraically.

**Essential Questions:**
- How can I use the properties of operations to create equivalent expressions?
- How are equations and inequalities alike? Different?
- What situations translate to an equation and what situations translate to an inequality?
- How are negative values represented with concrete and pictorial models?
- How do you preserve equality when solving an equation or inequality?

| Concept #2: Additive vs. Multiplicative | 6.4A, 6.4B, 6.5A, 6.6A, 7.4C |
| Concept #3: Writing Equations and Translating Between Views | 6.4B, 6.6B, 6.6C, 7.4C, 7.7A |

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| Concept #1: Generating Equivalent Expressions | 6.7B, 6.7C, 6.7A, 6.7D |
| Concept #2: Writing Equations and Inequalities | 6.9A, 6.9C, 7.10A, 7.10C |
| Concept #3: Solving Equations and Inequalities | 6.9B, 6.10A, 6.10B, 7.10B, 7.11A, 7.11B |

**Unit Overview:** In this unit, students will explore relationships that exist in triangles: sum of angles in a triangle, when three side lengths form a triangle, and the relationship between sides and angles in a triangle. It is important for students to have time to explore these relationships before having a formal lesson during which they are explicitly given the relationships. Students will also explore area formulas for parallelograms, triangles and trapezoids by decomposing the shapes and rearranging them. By doing so, they can relate them to other shapes and develop the formulas for finding area of these shapes. Finally, students will deepen their understanding of volume by solving problems related to volume of rectangular and triangular prisms and pyramids. Throughout this unit, students should be writing and solving equations and inequalities.

**Big Ideas:**
- Two-dimensional objects can be described, classified, and analyzed by their attributes.
- Some attributes of objects are measurable and can be quantified using unit amounts.

**Essential Questions:**
- What relationships exist between sides, angles, and sides and angles in triangles?
- How is the area of 2D figures determined?
How is the volume of rectangular prisms determined?

Concepts within Unit #6

<table>
<thead>
<tr>
<th>Concept #1: Properties of Triangles</th>
<th>TEKS (Link to Math TEKS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.8A, 6.10A</td>
<td></td>
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</tbody>
</table>

| Concept #2: 2D Measurement         | 6.8B, 6.8C, 6.8D, 6.10A |
| Concept #3: 3D Measurement         | 6.8C, 6.10A, 7.8A, 7.8B, 7.9A |

Grading Period 4

Unit 6: Geometric Application of Equations (Continued)

Estimated Date Range: Mar. 2 – Mar. 6 and Mar. 16 – Apr. 2

Note: This unit is continued from Grading Period 3. Please refer to Grading Period 3 for the Unit Overview, Big Ideas, and Essential Questions for this unit.

<table>
<thead>
<tr>
<th>Concept #1: Properties of Triangles</th>
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<tbody>
<tr>
<td>6.8A, 6.10A</td>
<td></td>
</tr>
</tbody>
</table>

| Concept #2: 2D Measurement         | 6.8B, 6.8C, 6.8D, 6.10A |
| Concept #3: 3D Measurement         | 6.8C, 6.10A, 7.8A, 7.8B, 7.9A |

Unit 7: Data and Statistics

Estimated Date Range: April 3 – April 28

Unit Overview: In this unit, students will determine which questions yield variable data and which questions do not. Students will represent and summarize categorical data using relative frequency and percent bar graphs, and will represent numerical data using histograms, dot plots, stem and leaf plots, and box plots. Students will generate numerical summaries for data using mean, median, mode, range and interquartile range. Data distributions will be described based on their shape. For Pre-AP, students will make comparisons of two sets of data represented in dot plots or box plots using center, spread, and shape.

Big Ideas:
- Data can be represented visually using tables, charts and graphs and the type of data determines the representation.
- There are numerical summaries that help us interpret data.

Essential Questions:
- What can a graph tell us about the data represented in the graph?
- What can numerical summaries tell us about the data?

Unit 8: Financial Literacy

Estimated Date Range: April 29 – May 28
Includes 7 days for semester exams and review

Unit Overview: In this unit, students will continue to learn about concepts affecting consumers. Students will learn the similarities and differences between debit cards and credit cards as well as the factors to consider when choosing a bank. Students will experience balancing a checkbook register using their understanding of integer operations.

Big Ideas:
- Consumers must make informed decisions.

Essential Questions:
- How do I choose a bank?
- How do I balance a checkbook register?
- How will I pay for college?
- How will I choose a job?

<table>
<thead>
<tr>
<th>Concept #1: Credit Cards vs Debit Cards</th>
<th>TEKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.14B</td>
<td></td>
</tr>
<tr>
<td>Concept #2: Checking Accounts</td>
<td>6.14A, 6.14C</td>
</tr>
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</tr>
<tr>
<td>Concept #3: Credit Reports</td>
<td>6.14D, 6.14E, 6.14F</td>
</tr>
<tr>
<td>Concept #4: Paying for College</td>
<td>6.14G</td>
</tr>
<tr>
<td>Concept #5: Jobs and Income</td>
<td>6.14H</td>
</tr>
</tbody>
</table>