## Second Grade Math 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.

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<td>Number Sense Routine</td>
<td>Number Sense Routine</td>
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<tr>
<td>Math Task</td>
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<td>Task Share and Student Reflective Closure</td>
<td>Student Reflective Closure</td>
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**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:**

**Elementary:**  [https://www.fortbendisd.com/Page/93917](https://www.fortbendisd.com/Page/93917)

### Mathematical Process Standards:

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

- 2.1A Apply mathematics to problems arising in everyday life, society, and the workplace
- 2.1B 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
- 2.1C 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
- 2.1D Communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate
- 2.1E Create and use representations to organize, record, and communicate mathematical ideas
- 2.1F Analyze mathematical relationships to connect and communicate mathematical ideas
- 2.1G Display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication

### Grading Period 1

**Unit 1: Creating a Mathematical Community through Graphing**  
Estimated Date Range: August 14 – 20

**Unit Overview:** In this unit, students will build on their knowledge of pictographs and bar graphs from First Grade. Students will be introduced to writing and solving word problems involving addition or subtraction using data represented within pictographs and bar graphs with intervals of one. They will also draw conclusions and make predictions from information in a graph. This unit is set up with graphing ideas to help teachers and students learn about each other and begin to develop routines and procedures for math class.

In addition to graphing, the intent of this unit is to establish a foundation for upcoming units by reinforcing and supporting student ownership of learning. The emphasis will be on the creation of a positive and respectful learning environment through highlighting attributes of Profile of a Graduate, Growth Mindset, and the implementation and support of structured Math Workshop routines and procedures. The goal is to build a community of learners with a mathematical mindset in which students value their mistakes and struggles, and feel safe to engage in mathematical discourse.

**Big Ideas:**
- Data helps us make sense of information in our world.
- Organization of information shows relationships.
- Data can be collected, organized, sorted, and analyzed in a variety of ways by creating real-object and picture graphs.

**Essential Questions:**
- Why and how do we sort information?
- How do graphs help you to interpret data?
- What are some ways we can organize data?
### Unit 1: Graphing and Setting Up Guided Math

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<td>Concept #1: Graphing and Setting Up Guided Math</td>
<td>2.10B, 2.10C, 2.10A, 2.10D</td>
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### Unit 2: Numeration

**Estimated Date Range:** August 21 – September 12

**Unit Overview:** In this unit, students will review first grade concepts such as reading, writing, representing, comparing and ordering numbers. In second grade students will be able to use standard, word, and expanded forms to represent numbers to 120. They will also use concrete and pictorial models to compose and decompose numbers to 120 in more than way. Students will be able to locate, name, and place numbers on an open number line. Students will use pairings of objects to determine if a number is even or odd up to the number 40. Students will continue to practice their numeracy skills using larger numbers as they go through second grade and future grades. Students will use this knowledge in their everyday life when working with numbers and apply this learning when using place value strategies to solve addition and subtraction problems.

**Big Ideas:**
- The base 10 number system uses digits 0-9, groups of 10 and place value to understand number structure.
- Any number can be represented in a number of ways that have the same quantity.
- Numbers, expressions, and measures can be compared by their value.
- Place Value knowledge impacts the understanding of operations.

**Essential Questions:**
- What is the difference between a digit and a value? How many digits are in our number system? What is a group of 10?
- How many ways can you represent a number?
- How do you compare numbers? How do you order numbers?
- Why do you need to know how to decompose and compose numbers?

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<td>Concept #2: Compose and Decompose Numbers 0-120</td>
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<td>Concept #4: Number Lines 0-120</td>
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### Unit 3: Addition and Subtraction to 120

**Estimated Date Range:** September 13 – October 10

**Unit Overview:** In this unit, students will develop addition and subtraction fact fluency. Students will solve one-step and multi-step addition and subtraction word problems. Students will make connections between place value and operations. Students will explore number sentences and equivalencies. Students will continue to use these skills in the future when they begin adding and subtracting with larger whole numbers, decimals and fractions.

**Big Ideas:**
- A problem solver understands what has been done, knows why the process was appropriate, and can support it with reasons and evidence.
- The base 10 system helps students solve addition and subtraction with understanding.
- Numerical expressions can be represented in different but equivalent ways to make calculations simpler.
- The same number sentence can be associated with different concrete or real-world situations, and different numbers sentences can be associated with the same concrete or real-world situation.
For a given set of numbers there are relationships that are always true.
Rules of arithmetic and algebra can be used together with notions of equivalence to transform equations so solutions can be found.

Essential Questions:
• What do you do to solve a problem?
• Why is place value important when solving addition and subtraction problems?
• What do you notice about $13 + 4 = 17$ and $10 + 7 = 17$?
• How can an addition or subtraction number sentence apply to real world situations?
• What is the relationship between $3 + 7+ 4$ and $7 + 4 + 3$?
• How can you find $17 + x = 21$?

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<td>Concept #2: Addition and Subtraction</td>
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Grading Period 2

Unit 3: Addition and Subtraction to 120 (continued)
Estimated Date Range: October 15 – October 30

Unit Overview: In this unit, students will develop addition and subtraction fact fluency. Students will solve one-step and multi-step addition and subtraction word problems. Students will make connections between place value and operations. Students will explore number sentences and equivalencies. Students will continue to use these skills in the future when they begin adding and subtracting with larger whole numbers, decimals and fractions.

Big Ideas:
• A problem solver understands what has been done, knows why the process was appropriate, and can support it with reasons and evidence.
• The base 10 system helps students solve addition and subtraction with understanding.
• Numerical expressions can be represented in different but equivalent ways to make calculations simpler.
• The same number sentence can be associated with different concrete or real-world situations, and different numbers sentences can be associated with the same concrete or real-world situation.
• For a given set of numbers there are relationships that are always true.
• Rules of arithmetic and algebra can be used together with notions of equivalence to transform equations so solutions can be found.

Essential Questions:
• What do you do to solve a problem?
• Why is place value important when solving addition and subtraction problems?
• What do you notice about $13 + 4 = 17$ and $10 + 7 = 17$?
• How can an addition or subtraction number sentence apply to real world situations?
• What is the relationship between $3 + 7+ 4$ and $7 + 4 + 3$?
• How can you find $17 + x = 21$?
### Unit 4: Graphing

**Estimated Date Range:** October 31 – November 6

**Unit Overview:** In this unit, students expand their data analysis knowledge to include creating pictographs and bar graphs with intervals or one or more, in addition to, solving and writing one-step word problems from bar graphs and pictographs. Students will continue to make predictions, draw conclusions and make comparisons from information in graphs.

**Big Ideas:**
- Data can be represented visually using tables, charts, and graphs. The type of data determines the best choice of visual representation.
- The question to be answered or the problem to be solved determines the most effective way the collection of data should be visually represented.
- Some questions can be answered or problems can be solved by collecting and analyzing data.

**Essential Questions:**
- How can we visually represent a collection of data in a variety of ways?
- Why is it important to visually represent data in a variety of ways?
- How can collecting and analyzing data help answer questions or solve problems?

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### Unit 5: 2D Shapes & 3D Solids

**Estimated Date Range:** November 7 – December 4

**Unit Overview:** In this unit, students will build on their understanding of two-dimensional and three-dimensional shapes beyond identifying to classifying and sorting three-dimensional shapes and polygons. Students will also compose two- and three-dimensional figures based on attributes. They will apply this understanding to other two-dimensional shapes in third grade and eventually determine perimeter, area and volume of two- and three-dimensional shapes.

**Big Ideas:**
- Good mathematicians classify objects based on their given attributes.
- Shapes have defining attributes that can be compared to other shapes.
- Decomposing a shape into more equal shapes creates smaller pieces.

**Essential Questions:**
- What are the ways to describe shapes?
- How can objects be compared using descriptors from geometry?
- Why is it important to be able to describe and name geometric shapes?
- How are geometric shapes constructed?

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<td>Concept #2: 3D Solids</td>
<td>2.8B, 2.8D</td>
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Unit 6: Numeration to 1,200
Estimated Date Range: December 5 – December 19

**Unit Overview:** In this unit, students will build from their understanding of numeracy to 120 to read, write, represent, compare and order, and compose and decompose numbers 0-1,200. Students will be able to locate, name and place numbers on an open number line. Students will continue to practice their numeracy skills using larger and larger numbers as they go through future grades. Students will use this knowledge in their everyday life when working with numbers, and apply this learning when using place value strategies to solve addition and subtraction problems. Students will apply this learning when using place value strategies to solve addition and subtraction problems.

**Big Ideas:**
- The base 10 number system uses digits 0-9, groups of 10 and place value to understand number structure.
- Any number can be represented in a number of ways that have the same quantity.
- Numbers, expressions, and measures can be compared by their value.

**Essential Questions:**
- What is the difference between a digit and a value? How many digits in our number system? What is a group of 10?
- How many ways can you represent a number?
- How do you compare numbers? How do you order numbers?
- Why do you need to know how to decompose and compose numbers?
- The same number sentence can be associated with different concrete or real-world situations, and different numbers sentences can be associated with the same concrete or real-world situation.
- Rules of arithmetic and algebra can be used together with notions of equivalence to transform equations so solutions can be found.

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<td>Concept #2: Compose and Decompose Numbers 0-1,200</td>
<td>2.2A, 2.2B</td>
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<tr>
<td>Concept #3: Comparing and Ordering Numbers 0-1,200</td>
<td>2.2D, 2.2C, 2.2E, 2.2F, 2.7A, 2.7B, 2.9C</td>
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**Grading Period 3**

Unit 7: Addition and Subtraction to 1,000
Estimated Date Range: January 7 – January 29

**Unit Overview:** In this unit, students will continue to build on addition and subtraction fact fluency from kindergarten (to 10) and first grade (to 20). Students will work with larger numbers to solve one-step and multi-step addition and subtraction word problems. Students will make connections between place value and operations and explore number sentences. Adding and subtracting with money and data from graphs will also be used to solve and create addition and subtraction problems that relate to the real world. Students will continue to add and subtract larger and larger whole numbers and decimals and fractions in future grades.

**Big Ideas:**
- A problem solver understands what has been done, knows why the process was appropriate, and can support it with reasons and evidence.
- The base 10 system helps students solve addition and subtraction with understanding.
- Numerical expressions can be represented in different but equivalent ways to make calculations simpler.
• Rules of arithmetic and algebra can be used together with notions of equivalence to transform equations so solutions can be found.

Essential Questions:
• What do you do to solve a problem?
• Why is place value important when solving addition and subtraction problems?
• How can an addition or subtraction number sentence apply to real world situations?

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Unit 8: Money and Personal Financial Literacy
Estimated Date Range: January 30 – February 13

Unit Overview: In this unit, students will use their prior knowledge on identifying and assigning a value to coins to count a collection of coins and write the amount using symbols and a decimal point. Students will also learn about financial matters including saving, spending, borrowing and lending. Financial literacy includes knowing the difference between producers and consumers and how much it costs to produce something. Future learning around money and financial literacy will aide students in working with decimals and help them become financially responsible adults, as students learn about spending, saving, giving and balancing a budget.

Big Ideas:
• All pieces of money have a specific value.
• An amount of money can be represented using different combinations of pieces of money.
• Money is used to satisfy needs and wants.
• Important personal finance knowledge and skills help people become financially capable and responsible to make decisions when it comes to satisfying needs and wants.

Essential Questions:
• What is the value of money?
• Are their different ways of getting to the same amount?
• How is money used?

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Unit 9: Measurement
Estimated Date Range: February 18 – March 6

Unit Overview: In this unit, students will build from their understanding of nonstandard units of length to standard units of length. Students will measure using customary and metric measuring tools to the nearest marked unit. They will be able to explain the relationship between the number of units needs and the size of the unit and use this knowledge to estimate length. They will determine area with concrete models counting squares and knowing that the number of squares represents the area in square units. This will build in future years to measuring and converting units of length and determining and using the formula for area and then finding surface area.

Big Ideas:
• Some attributes of objects are measurable and can be quantified using unit amounts. The longer the unit of measure, the fewer units it takes to measure the object.
• Any measure can be represented in different ways that have the same value.
• Measures can be compared by their relative values.
• Measurements can be approximated using known referents as the units in the measurement process.

**Essential Questions:**
• How can we measure objects? Why do measurements need both numbers and units? Why do we need standard units in measurement?
• How do we choose the best unit of measurement to use?
• What objects can you use to estimate length?
• Why do we need standard units in measurement?

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**Grading Period 4**

**Unit 10: Multiplication and Division**

**Estimated Date Range:** March 16 – April 7

**Unit Overview:** In this unit, students will build on their knowledge of repeated addition and subtraction to bridge to multiplication and division. Students will model multiplication and division situations with objects and pictures. They will also create and describe multiplication and division situations in relation to repeated addition and subtraction, such as 4 + 4 + 4 is 3 groups of 4 and There were 3 bags with 4 cookies in each bag. This will help students begin to understand the meaning of multiplication and division and basic facts which will bridge to larger numbers in third grade and future grades.

**Big Ideas:**
• Numerical expressions can be represented in different but equivalent ways to make calculations simpler.
• For a given set of numbers there are relationships that are always true.

**Essential Questions:**
• How do I know where to begin when solving a problem?
• What is the relationship between the numbers presented?

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<td>Concept #3: Multiplication and Division</td>
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</table>
**Unit 11: Fractions**  
Estimated Date Range: April 8 – May 11

**Unit Overview:** In this unit, students will expand on their knowledge of partitioning objects into halves and fourths to include eighths. They will not only partition objects but also know how many fractional parts are needed to make a whole and be able to count the fractional parts beyond a whole. Students will be able to explain that the number of fractional parts needed for a whole is proportional to the size of the fractional part. Applying their understanding that fractional pieces need to be the same size to identifying examples and non-examples of halves, fourths and eighths will allow students to generalize to other fractional amounts. Though much time is spent on whole numbers in elementary, beginning in 4th grade, students apply their understanding of fractions to computation. Being able to visual fractional representations will allow students to more easily compose and decompose and manipulate fractions.

**Big Ideas:**
- Any number can be represented in an infinite number of ways that have the same value.
- A comparison of a part to the whole can be represented using a fraction. A fraction can be a number.
- The relationship between the amount of fractional parts and size of the parts is foundational for comparing fractions.

**Essential Questions:**
- What is a fraction?
- Why is it important to understand the relationship between amount of fractional parts and size of the parts?

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**Unit 12: Time**  
Estimated Date Range: May 12 – May 28

**Unit Overview:** In this unit, students will build on their ability to tell time to the hour and half hour to tell time to the minute. Students will be able to read and write time, knowing that the colon separates the minutes and the hours. They should also be able to determine activities and times that occur in the a.m. and p.m. This will help students in future grades determine the duration of events.

**Big Ideas:**
- Understanding time as a unit of measure that breaks our day into increments is a vital life skill

**Essential Questions:**
- How does being able to tell time help you organize yourself?

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