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.

**Adopted Resources:**

**High School:** [https://www.fortbendisd.com/Page/93927](https://www.fortbendisd.com/Page/93927)

**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:

- **S.1A** Apply mathematics to problems arising in everyday life, society, and the workplace
- **S.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
- **S.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
- **S.1D** Communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate
- **S.1E** Create and use representations to organize, record, and communicate mathematical ideas
- **S.1F** Analyze mathematical relationships to connect and communicate mathematical ideas
- **S.1G** Display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication

**Grading Period 1**

**Unit 1: Analyzing One-Variable Data**  
Estimated Date Range: Aug. 14 – Sept. 6

**Unit Overview:** In this unit, students will extend their knowledge of statistical representations for categorical and quantitative data. Content covered will include representing and analyzing both categorical and quantitative data. Students will analyze the data in context of the situation using appropriate statistical language. Students will also compare multiple sets of data using statistical representations of the distributions.
Big Ideas:
- Statistical models and representations display data in order to interpret the data and draw conclusions.
- Summary statistics provide specifics about data in regards to variability.

Essential Questions
- How do we organize, describe, and display data?
- How can graphs help us find trends in real world situations?
- How can summary statistics meaningfully describe a set of data?

### Concepts within Unit #1

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#### Unit 2: The Normal Curve

**Estimated Date Range: Sept. 9 – Sept. 24**

**Unit Overview:**
In this unit, students will continue their study of one-variable statistics. They will begin by using z-scores to standardize data in order to make comparisons among data with different means and standard deviations. Students then will be introduced to density curves with a special focus on the Normal Curve. Students will first make predictions using the 68-95-99.7 Rule. Then students will sue use the normal models and z-scores to normalize data in order to make predictions. Students will use technology in order to determine percentiles and z-scores from data.

Big Ideas:
- Statistical models and representations display data in order to interpret the data and draw conclusions.
- The normal model allows us to standardize data in order to make

Essential Questions
- How do we organize, describe, and display data?
- How can graphs help us find trends in real world situations?
- How do we analyze different types of data sets?
- How can summary statistics meaningfully describe a set of data?

### Concepts within Unit #2

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#### Unit 3: Analyzing Two-Variable Data

**Estimated Date Range: Sept. 25 – Oct. 10 and Oct. 15 – Oct. 18**

**Unit Overview:**
In this unit, students will extend their study of bivariate data and linear regression from previous courses including Algebra 1 and Algebra 2. Students will compare different methods and models for determining lines of best fit. Students will explore lines of best fit with and without technology.

Big Ideas:
- Exploratory analysis of data makes use of graphical and numerical techniques to study patterns and departures from patterns.

Essential Questions
- Why is data analyzed?
### Concepts within Unit #3

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### Grading Period 2

**Unit 4: Study Design**

**Estimated Date Range:** Oct. 21 – Nov. 22

**Unit Overview:**
In this unit students will now address where the data that they have been analyzing actually comes from. The unit begins with the concept of randomness, focusing on using random numbers as a tool for being “fair” and investigating real-world situations. Simulations are encouraged during this unit. The unit then moves into discussing sample surveys. Both ideas of sampling error and bias is discussed here. Discussion about observational studies and experiments will close out the unit, with emphasis on controlled randomized experiments to establish cause-and-effect relationships.

**Big Ideas:**
- To collect good data, it is necessary to decide what collection method is most suitable and how to best pose any questions required to collect the data.
- The way in which data is collected matters.
- Bias, precision, and sampling methods are the foundation for collecting data.
- Data must be collected according to a well-developed plan if valid information on a conjecture is to be obtained. This plan includes clarifying the question and deciding upon a method of data collection and analysis.

**Essential Questions**
- How can random selection produce samples that are representative of the population?
- What information can observational studies and surveys provide about the characteristics of a sample or population?
- How can we determine if a particular sampling method is good?
- How do we study and analyze statistical problems?

### Concepts within Unit #4

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**Unit 5: Probability**

**Estimated Date Range:** Dec. 2 – Dec. 19

**Note:** Includes 5 days for semester exams and review

**Unit Overview:**
In this unit students will review probability. Much of what is covered in this unit students have seen in middle school and Geometry. Two-way tables were referred to as two-way frequency tables in Geometry. The fundamental idea of probability is formalized in this unit to help lay the foundation for understanding statistical inference. Students will revisit the ideas centered around complementary events, unions of disjoint events, and intersections of independent events. The understanding of probability in this unit will help students answer the question of “how unusual must the observed results be in order to be considered statistically significant?” For calculating probabilities build ideas of solving based on three important words: not, or, and and. The use of Venn diagrams, two-way tables, and tree diagrams should be utilized to help students organize their thinking. Utilize the additional days in this unit to provide students with rich, hands-on learning opportunities to explore probability through experiments and simulations. The concepts in this unit include the following: Probability and Simulations, Two-Way Tables and Venn Diagrams, and Probability Rules.
Big Ideas:
- The probability of an event is a number between 0 and 1 that report the long term frequency of the event’s occurrence.
- Probability can be used to make predictions about real-world situations.

Essential Questions:
- What is probability and how can we apply it to situations?

Concepts within Unit #5

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Grading Period 3

Unit 6: Random Variables and Distributions
Estimated Date Range: Jan. 7 – Jan. 31

Unit Overview:
In this unit students will explore random variables with probability models. Students will explore the difference between discrete and continuous random variables utilizing mean and standard deviation for discrete random variables and mean and median for continuous random variables. The discussion of continuous random variables will set the stage for Normal Standard Distributions. Expected values and standard deviations are discussed. Students will be introduced to the Central Limit Theorem and its relation to sampling distributions.

Big Ideas:
- Probability is the tool used for anticipating what the distribution of data should look like under a given model.
- Exploratory analysis of data makes use of graphical and numerical techniques to study patterns and departures from patterns.

Essential Questions
- What is the purpose of probability?
- Why is data analyzed?

Concepts within Unit #6

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Unit 7: Inference and Confidence Intervals - Proportions
Estimated Date Range: Feb. 3 – Mar. 6

Unit Overview:
In this unit, students will be introduced to statistical inference. Students will apply knowledge from Unit 5 on distributions. This unit focusses on proportions. Students will create and interpret confidence intervals for proportions given statistical data. Students will also create and interpret 1-sample and 2-sample tests for proportions. By studying and interpreting statistical inference students become better consumers of information.

Big Ideas:
- Statistical inference guides the selection of appropriate models in order to interpret real-world situations.

Essential Questions
- Why do we use statistical inference?
### Concepts within Unit #7

| Concept #1 - Confidence Intervals for Proportions | S.6A, S.6B, S.6D, S.6E |

### Grading Period 4

**Unit 8: Inference and Confidence Intervals - Means**

**Estimated Date Range:** Mar. 16 – April 20

**Unit Overview:** In this unit, students will continue to statistical inference. Students will apply knowledge from Unit 5 on distributions. This unit focuses on means. Students will create and interpret confidence intervals for means given statistical data. Students will also create and interpret 1-sample and 2-sample tests for means. By studying and interpreting statistical inference, students become better consumers of information.

**Big Ideas:**
- Statistical inference guides the selection of appropriate models in order to interpret real-world situations.

**Essential Questions**
- Why do we use statistical inference?

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**Unit 9: Statistical Studies**

**Estimated Date Range:** April 21 – May 28

**Note:** Includes 7 days for semester exams and review

**Unit Overview:** In this unit, students will synthesize their understanding by designing, performing, and analyzing a statistical study or experiment. Students will design the experiment, collect data, analyze the data, run the appropriate tests, and then present their study.

**Big Ideas:**
- Data must be collected according to a well-developed plan if valid information on a conjecture is to be obtained. This plan includes clarifying the question and deciding upon a method of data collection and analysis.
- Statistical inference guides the selection of appropriate models in order to interpret real-world situations.

**Essential Questions**
- How do we study and analyze statistical problems?
- Why do we use statistical inference?

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