FBISD

INSPIRE • EQUIP • IMAGINE

PK – 12 Math Plan

STEM Department
Teaching & Learning

Table of Contents

FBISD CORE BELIEFS AND COMMITMENTS

DISTRICT GOALS AND OBJECTIVES

The Fort Bend Independent School District (FBISD) Board of Trustees developed and adopted District Goals and Objectives to align and assist with prioritizing work across the district. These goals and objectives outline a commitment to a student-centered approach to curriculum, instruction, and assessment that will enable all students to reach their full potential.

District Goal 1: Fort Bend ISD will provide an equitable learning environment that provides all students access to the FBISD curriculum.

District Goal 2: Fort Bend ISD will ensure students own and are responsible for their learning, behavior, and progress through the FBISD curriculum.

District Goal 3: Fort Bend ISD will provide an inclusive, collaborative, and fluid learning environment with opportunities for both risk-taking and success.

District Goal 4: Fort Bend ISD will develop students' social-emotional, academic, literacy, language, and life skills in a safe and secure Collaborative Community at every school.

PROFILE OF A GRADUATE

The Curriculum Management Plan provides a framework to ensure that FBISD curriculum supports teachers in empowering students with the attributes aligned to the District's Vision. The K – 12 Math plan aligns to support the vision.

The vision of FBISD is to graduate students who exhibit the attributes of the District's Profile of a Graduate. A Fort Bend ISD graduate has a rigorous academic foundation, strong character, and is

…equipped with skills for life.

Fort Bend ISD graduates exhibit grit and determination in all aspects of life; respect self and others; engage in healthy life choices; are literate and articulate; proficient with technology; and meaningfully and practically apply knowledge in productive ways.

…a servant leader.

Fort Bend ISD graduates demonstrate confidence while maintaining a humble and kind demeanor; prioritizing the needs of others while accepting responsibility for themselves and are accountable for their own actions; are optimistic; and strive to bring out the best in others.

…an effective communicator.

Fort Bend ISD graduates communicate clearly both orally and in writing; respectfully and actively listen to others; appropriately engage in courageous conversations; and appropriately adapt their communication style to the audience.

…a critical thinker.

Fort Bend ISD graduates are visionary and solutions-oriented problem solvers; are inquisitive and innovative; and have the courage to actively challenge conventional methods in order to improve themselves and the world around them.

…a compassionate citizen.

Fort Bend ISD graduates are empathetic to their fellow citizens, exhibiting care and concern for others; are inclusive and embrace differences; are culturally aware; actively engage in improving our diverse community; exercise their right to vote; and are dependable, respectful, trustworthy, and self-disciplined.

…a collaborative team member.

Fort Bend ISD graduates work effectively with others to achieve group goals; take actions that respect the needs and contributions of others; yield their own objectives to the goals of the team; and positively facilitate and contribute to teamwork.

…a life-long learner.

Fort Bend ISD graduates approach life with wonder and curiosity; seek opportunities to be creative; possess a thirst for knowledge and the ability to adapt to change; and are academically prepared to pursue and attain futures beyond what they can imagine!

INTRODUCTION

Philosophy

In a Fort Bend ISD mathematics classroom, students and teachers communicate thinking, engage in rigorous and relevant math tasks, and persevere in a safe and healthy learning environment where mistakes are valued as an opportunity to learn. Students are provided the opportunity to take ownership of their own learning as a result of student centered instruction within a blended environment to promote the attributes of the Profile of a Graduate.

Student centered instruction in a math classroom is designed to develop:

- assessment capable learners,
- communication and collaboration skills, and
- critical thinkers in an inquiry based environment.

Purpose of the Plan

The purpose of the PK – 12 Math Plan is to provide a comprehensive guide for math instruction and professional learning for teachers in Fort Bend ISD that supports the implementation of the written curriculum through the components of a student centered math classroom in all grade levels.

Components of the Plan

The components of this plan include:

- Philosophy of Math Instruction
- Guiding Principles
- Terminology
- Math Instructional Model
- Sample Lesson Cycles
- Assessment Philosophy & Framework
- Intervention and Enrichment Models
- Professional Learning Plan
- Implementation Plan & Timeline

GUIDING PRINCIPLES

Guiding Principles

The Eight Mathematics Teaching Practices (National Council of Teachers of Mathematics, 2014) provide a research-based framework for the teaching and learning of mathematics. The Teaching Practices are:

1. Establish mathematics goals to focus learning.
2. Implement tasks that promote reasoning and problem solving.
3. Use and connect mathematical representations.
4. Facilitate meaningful mathematical discourse.
5. Pose purposeful questions.
6. Build procedural fluency from conceptual understanding.
7. Support productive struggle in learning mathematics.
8. Elicit and use evidence of student thinking.

The FBISD PK – 12 Math Plan Task Force adopted the Teaching Practices as the Guiding Principles to promote student centered Math Instruction in FBISD. For each Guiding Principle, the task force developed the role of the teacher, the role of the student, administrator look-fors, and ways families can support students in becoming assessment capable learners who effectively collaborate and communicate in an inquiry based learning environment focused on thinking critically.

Guiding Principle: *Establish mathematics goals to focus learning*

In FBISD, teachers articulate mathematics goals through Learning Intentions. To develop student ownership of learning, teachers work in collaboration with students to develop learning goals, make revisions, and track progress using success criteria that are aligned to the defined proficiency in the learning progression.

Description: Establish mathematics goals (learning intentions) to focus learning. Effective teaching of mathematics establishes clear goals (learning intentions with aligned success criteria) for the mathematics that students are learning, situates goals within learning progressions, and uses the goals to guide instructional decisions.

Profile of a Graduate Attribute: e*quipped with skills for life*… Students who are actively involved in setting their own learning goals, as well as monitoring their progress along the way, will be engaged and understand where they are and where they are going in the learning process.

The Role of the Teacher is to:

- Collaborate with other teachers in PLCs to create student learning intentions that guide instructional planning based on formative data sources
- Consider and provide differentiation that accommodates *all students* achievement of the learning intentions and success criteria
- Identify and communicate to students how learning intentions fit within a learning progression for the unit
- Facilitate student ownership of mathematics instructional learning intentions
- Involve students to establish success criteria for their learning intentions
- Utilize strategies to access students' background knowledge
- Provide opportunities for students to receive feedback on their progress from both teacher and peers
- Determine and utilize rubrics and checklists for student self and peer assessment

The Role of the Student is to:

- Set personal learning goals based on mathematical understanding within the learning progression
- Monitor progress toward attainment of goals and use feedback to revise and adjust goals as needed
- Articulate what they are *learning* (not what they are *doing*) and why they are learning it, make connections to previous learning, and how they know they are successful
- Self and peer assess using rubrics and checklists

The Administrator will see:

- Students verbalize what they are learning and why
- Students describe how they know when they will be successful and adjust their strategies as needed to stay on track
- Students identify strengths and next steps
- Students engage in self and peer assessment of their progress toward learning intentions
- Teachers collaborate in PLCs to determine mathematical instructional intentions and success criteria
- Teachers structure a classroom culture in which students feel safe to give and receive peer feedback
- Teachers utilize a variety of research-based instructional strategies to support mathematics instructional learning intentions

Families can support students to:

- Track their progress on their learning goals
- Discuss what they are learning and why
- Make connections to their previous learning and to real-world situations
- Develop social skills that support a safe classroom environment for giving and receiving peer feedback

Guiding Principle: *Implement tasks that promote reasoning and problem solving*

Description: Effective teaching of mathematics engages students in solving and discussing tasks that promote mathematical reasoning and problem solving and allow multiple entry points and varied solution strategies.

Profile of a Graduate Attribute: *critical thinker* **…** Students are learning to become critical thinkers as they are becoming solutions-oriented problem solvers in the math classroom.

The Role of the Teacher is to:

- Collaborate with other teachers in PLCs to select rigorous tasks that align to instructional planning based on formative data sources and that engage students in the mathematical process standards
- Consider and provide rigorous tasks that accommodate *all* students to be successful, such as language supports, scaffolding, IEP modifications, etc. that maintains the rigor of the tasks
- Choose tasks that allow for multiple entry points with multiple right answers or multiple ways of arriving at an answer
- Support students to explore tasks without taking over their thinking
- Intentionally plan and provide opportunities for students' purposeful mathematical discussions

The Role of the Student is to:

- Look for and consider multiple ways to solve problems, thinking and reasoning both independently and collaboratively with peers, before seeking teacher support
- Select procedures appropriate for the task and use them efficiently, flexibly, and accurately
- Use mathematical vocabulary, both orally and in writing, to communicate and justify their solutions, strategies, and reasoning
- Select and use tools appropriately in order to solve both mathematical and contextual problems

The Administrator will see:

- Students self-initiate the problem-solving process by analyzing a problem, devising and enacting a plan, and explaining their reasoning and solutions using appropriate mathematical vocabulary
- Students as independent thinkers who rely on their own mathematical understanding and that of their peers
- Students respectfully respond to their peers by listening to their explanations without interruption and challenge their ideas
- Teachers structure a classroom culture in which students feel safe to take risks and persevere when presented with challenging mathematical situations
- Teachers utilize talk moves to clarify and extend students' discussions
- Teachers circulate among groups of students as they discuss and solve tasks, listens in, poses questions to extend student thinking, and allows student to constructively struggle while moving on to other groups

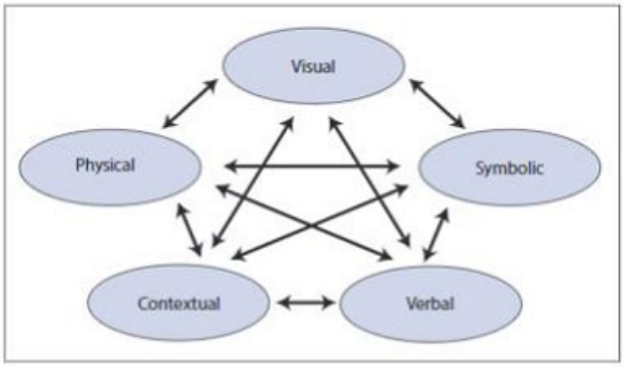
Families can support students to:

- Develop a growth mindset that empowers them to engage in productive struggle and persevere in problem solving
- Discuss their mathematical processes as well as their solutions
- Celebrate their efforts and "can-do" attitude
- Develop social skills that support students to listen to others without judgment and respectfully challenge their ideas

Guiding Principle: *Use and connect mathematical representations*

The Concrete – Representational – Abstract (CRA) model allows students to access mathematics content first through a concrete approach ("doing" stage) then representational ("seeing" stage) and then finally abstractly ("symbolic" stage). The CRA model allows students to develop conceptual understanding, so that they have a deeper understanding of the mathematics and are able to apply and transfer their learning across concepts and content.

Description: Effective teaching of mathematics engages students in making connections among mathematical representations (concrete, representational and abstract) such as words, drawings, diagrams, models, tables, graphs, and equations to deepen understanding of mathematics concepts and procedures and as tools for problem solving.



Profile of a Graduate Attribute: *effective communicator...* By utilizing a variety of mathematical representations to communicate math understanding, students are effective communicators of mathematical reasoning both verbally and in writing in order to make mathematical connections between concepts and real world applications.

The Role of the Teacher is to:

- Collaborate with other teachers in PLCs to select tasks and design instruction and assessment that promotes the use of representations as tools for problem solving and communicating mathematical thinking
- Consider and provide differentiation that accommodates *all* students to be successful in creating and using multiple representations to solve problems without reducing the rigor or mathematical understanding
- Allocate instructional time for, encourage, and support students to think deeply about connections among representations
- Provide opportunities for students to explore multiple approaches to solve a problem
- Introduce various representations (including concrete manipulatives, pictorial, and symbolic) and focus students' attention on their structure and details to make connections among them

The Role of the Student is to:

- Create and use multiple representations (including concrete manipulatives, pictorial, and symbolic) to organize, record, and communicate mathematical ideas, reasoning, and their implications
- Choose representations to use as tools for problem solving
- Seek out multiple approaches to solve a problem
- Describe and justify mathematical understandings using multiple representations
- Analyze mathematical relationships to connect and communicate mathematical ideas
- Decontextualizing real-world problems to make mathematical connections and contextualize mathematical ideas by connecting them to real-world situations

The Administrator will see:

- Students select and use various, appropriate representations (including concrete manipulatives, pictorial, and symbolic) as tools for understanding mathematical concepts and solving problems
- Students use their choice of representations to justify their mathematical reasoning
- Students refer to anchor charts, co-created with the teacher, to assist with development of their mathematical understanding
- Teachers provide tools for students to select and use appropriately as aids for problem solving
- Teachers challenge students' thinking by asking them to represent their reasoning in more than one way

Families can support students to:

- Develop social skills that support students to persevere through problem solving
- Discuss multiple approaches to solving problems, and ask questions that require students to justify their mathematical decision making
- Ask questions that require students to describe and elaborate on their choice of representations to solve a problem

Guiding Principle: *Facilitate meaningful mathematical discourse*

Description: Effective teaching of mathematics facilitates discourse among students to build shared understanding of mathematical ideas by analyzing and comparing student approaches and arguments.

Profile of a Graduate Attribute: *effective communicator*, *collaborative team member* … Students who are engaged in purposeful mathematical conversations learn to effectively communicate by being able to clearly articulate mathematical concepts orally and in writing, actively collaborate with their peers to engage in appropriate discourse with others around their thinking.

The Role of the Teacher is to:

- Collaborate with other teachers in PLCs to purposefully plan for and structure learning activities that involve independent work, pairs, groups, and whole class discussions
- Consider and provide language support and accommodations to *all* students in order to successfully engage them in productive mathematical discussions while maintaining the rigor of the task
- Ensure progress toward mathematical goals by making explicit connections to student approaches and reasoning
- Select and sequence student approaches and solution strategies for whole-class analysis, comparison, and discussion
- Create a classroom culture safe for risk taking where students initiate sharing of mathematical thinking without first relying on teacher modeling

The Role of the Student is to:

- Use examples to support or counterexamples to respectfully challenge other's ideas and use mathematical vocabulary to explain and defend his/her own approaches to build a shared understanding of mathematical ideas
- Actively engage in reflective thinking on and participate in collaborative discussions about mathematical ideas
- Seek to understand the approaches used by peers by listening carefully, asking clarifying questions, and describing the approaches used by others
- Justify and explain how different approaches to solving a task are the same or different

The Administrator will see:

- Students collaborate in a variety of grouping structures to compare their approaches and solutions
- Students respond by making connections to their peers' approaches and explain whether they agree/disagree and why
- Teachers use talk moves to facilitate whole and small group discourse.
- Teachers provide sufficient independent think time prior to time for collaborative discussions
- Teachers listen carefully to students' discussions, and analyzes students' real-time work, to make thoughtful decisions regarding how to begin a productive, whole-class discussion

Families can support students to:

- Discuss their mathematical processes as well as their solutions
- Develop social skills that support students to listen to others without judgment and respectfully challenge their ideas
- Ask questions that require students to describe and elaborate on their thinking and reasoning

Guiding Principle: *Pose purposeful questions*

Description: Effective teaching of mathematics uses **purposeful questions** to **assess and advance students' reasoning** and sense making about important mathematical ideas and relationships.

Profile of a Graduate Attribute: *effective communicator …* Students are able to communicate mathematical reasoning in self and peer assessment in order to think critically about their own learning as well as provide feedback to others.

The Role of the Teacher is to:

- Collaborate with other teachers in PLCs to purposefully plan questions that promote sense making and deep understanding of mathematical concepts and procedures
- Consider and provide language support and accommodations to *all* students in order to successfully ask and answer purposeful questions while utilizing mathematical vocabulary
- Build a culture of mutual respect and risk taking so that all students are engaged and feel safe to ask and answer questions
- Ask questions that both build and reveal understanding of both previously learned content and new content and practice without taking over or funneling students' thinking
- Pose questions that make mathematics visible and accessible to students
- Utilize strategies including sufficient wait time that guarantee all students opportunities to answer questions and demonstrate and justify their thinking
- Ensure that questions go beyond gathering information to probing students' thinking

The Role of the Student is to:

- Use linguistic supports when asking questions of peers to better understand and critique their strategies
- Make connections by accessing prior knowledge to understand new concepts
- Inquire of each other about mathematical ideas and relationships instead of looking to the teacher for answers
- Think clearly about a response without rushing to respond quickly
- Expect to reflect upon and justify answers using appropriate mathematical vocabulary, both orally and in writing

The Administrator will see:

- Students ask clarifying and advancing questions of each other with provided linguistic supports such as sentence frames and anchor charts
- Students explain and justify their thinking without prompting from the teacher
- Teachers pose and scaffold open-ended questions that demand higher-level student thinking and reasoning
- Teachers use wait time and intentionally orchestrate cooperative learning structures for all students to process and reflect
- Teachers utilize strategies for purposefully targeting students to respond and for connecting those responses to reveal mathematical understandings

Families can support students to:

- Expect to go beyond answering questions to explain and justify their mathematical processes as well as their solutions
- Develop social skills that encourage students to ask and answer their own and other's questions
- Engage in situations that challenge them to inquire and persevere through questioning

Guiding Principle: *Build procedural fluency from conceptual understanding*

The Concrete – Representational – Abstract (CRA) model allows students to access mathematics content first through a concrete approach ("doing" stage) then representational ("seeing" stage) and then finally abstractly ("symbolic" stage). The CRA model allows students develop conceptual understanding, so that they have a deeper understanding of the mathematics and are able to apply and transfer their understanding across concepts and content.

Description: Effective teaching of mathematics builds fluency with procedures on a foundation of conceptual understanding so that students, over time, become skillful in using procedures flexibly as they solve contextual and mathematical problems. Procedural fluency and conceptual understanding are essential and integrated components of mathematical proficiency.

Profile of a Graduate Attribute: *critical thinker …* Students are able to use concrete and visual tools to think critically in order to develop, apply, and evaluate their own mathematical reasoning.

The Role of the Teacher is to:

- Collaborate with other teachers in PLCs to select learning experiences that represent a balance of conceptual understanding and procedural fluency and to assist students to make connections to previously learned concepts
- Consider and provide language supports, scaffolding, IEP modifications, etc. that accommodate *all* students to successfully develop and use procedures efficiently, flexibly, and accurately
- Model concretely, pictorially, and abstractly to connect procedural and conceptual understanding
- Facilitate the development of connections between mathematical concepts and procedures
- Expect students to discuss and explain why the procedures they use work to solve problems
- Connect student-generated strategies and methods to more efficient procedures as appropriate
- Provide students with differentiated opportunities for distributed practice of procedures over time to attain procedural fluency, which is meaningless without a sound conceptual mathematical understanding

The Role of the Student is to:

- Use concrete and visual models to develop, apply, and evaluate mathematical procedures
- Explain the mathematical basis for the procedure(s) being used to solve a problem
- Demonstrate flexible use of strategies and methods in order to choose an appropriate procedure for situation
- Develop and use procedures efficiently, flexibly, and accurately that are appropriate for the problem

The Administrator will see:

- Students use concrete models and tools to explain the mathematical procedures they are using
- Students engage in differentiated opportunities for distributed practice of procedures over time to attain procedural fluency
- Teachers use concrete and visual models to support students in developing, applying, and evaluating their own mathematical procedures
- Teachers encourage students' flexible use of strategies to solve contextual and mathematical problems

Families can support students to:

- Develop social skills that support students to seek understanding of mathematical procedures
- Successfully develop and use their own procedures efficiently, flexibly, and accurately
- Explain the connections between their choice of mathematical procedure(s) to solve a problem and the concrete/visual models that support the procedure(s)

Guiding Principle: *Support productive struggle in learning mathematics*

Description: Effective teaching of mathematics consistently provides students, individually and collectively, with opportunities and supports to engage in productive struggle as they grapple with mathematical ideas and relationships.

Profile of a Graduate Attribute: *life - long learner …* When students are engaged in a learning environment that provides opportunities for risk taking combined with support tools, they grow as learners and are motivated to persevere in problem solving.

The Role of the Teacher is to:

- Collaborate with other teachers in PLCs to plan frequent opportunities for students to constructively struggle with the mathematics and to select/create open-ended tasks with multiple right answers or multiple ways of arriving at an answer
- Consider and provide language supports, scaffolding, IEP modifications, etc. that accommodate *all* students to successfully engage in productive struggle
- Give students time to struggle with tasks, and ask questions that scaffold students' thinking without stepping in to do the work for them
- Help students realize that confusion and errors are a natural part of learning by facilitating discussions on mistakes, misconceptions, and struggles
- Praise students for their efforts in making sense of mathematical ideas and perseverance in reasoning through problems

The Role of the Student is to:

- Continue working on problems even when the task requires productive struggle or when a solution is not readily apparent
- Grapple at times with mathematics tasks but realize that breakthroughs often emerge from confusion and struggle
- Ask questions that will help make progress when struggling with tasks
- Persevere in solving problems and realizing that is acceptable to say, "I don't know how to proceed here," but it is not acceptable to give up
- Help one another without telling classmates what the answer is or how to solve the problem

The Administrator will see:

- Students and teachers collaborate in a safe learning environment in which mistakes are seen as an opportunity to learn
- Students actively engaged in open-ended tasks that require productive struggle
- Teachers assist or ask scaffolding questions of struggling students and then provide time and space for students to persevere on their own or with others

Families can support students to:

- Develop a growth mindset that empowers them to productively struggle
- Celebrate their efforts and "can-do" attitude
- Develop social skills that enable students to see mistakes as opportunities to learn
- Set goals for persisting through a series of tasks to complete a larger objective or project

Guiding Principle: *Elicit and use evidence of student thinking*

Description: Effective teaching of mathematics uses evidence of student thinking to assess progress toward mathematical understanding and to adjust instruction continually in ways that support and extend learning.

Profile of a Graduate Attribute: *critical thinker … effective communicator …* Students reveal their mathematical understanding and reasoning using purposeful discussions grounded in thinking critically in order to reflect on success, mistakes and misconceptions in order to improve their understanding of concepts.

The Role of the Teacher is to:

- Collaborate with other teachers in PLCs to identify the learning intentions and success criteria and reflect on evidence of student thinking to make instructional decisions based on student need
- Consider and provide language supports, scaffolding, IEP modifications, etc. that accommodate *all* students to successfully understand the learning intentions and meet the success criteria
- Communicate the learning intentions and co-create with students the success criteria of the lesson
- Anticipate students' misconceptions, responses, and strategies to support and extend their learning
- Elicit and gather evidence of student thinking at strategic points during instruction to make in-the-moment decisions on how to respond to students with questions and prompts that probe, scaffold, and extend

The Role of the Student is to:

- Reveal mathematical understanding, reasoning, and methods in written work and classroom discourse
- Reflect on mistakes and misconceptions to improve mathematical understanding
- Ask questions, respond to, and give suggestions to support peers' mathematical understanding
- Self-assess and monitor progress toward mathematics learning goals and identify areas for improvement

The Administrator will see:

- Students monitor their progress using self- and peer-assessment
- Students provide and utilize feedback
- Teachers implement a variety of strategies to monitor student learning
- Teachers provide feedback to students, or structure opportunities for students to provide feedback to each other, based on progress toward success criteria

Families can support students to:

- Develop strategies to monitor progress toward meeting goals
- Celebrate their efforts and mathematical growth
- Develop social skills that enable students to accept and respond appropriately to feedback from others

TERMINOLOGY

Term	What it is	What it isn't
Communicate mathematical thinking	Communicate mathematical thinking, processes, and strategies coherently and clearly using numbers, pictures, and words to peers, teachers, and others.	Communicating mathematical thinking is not the giving and receiving of answers.
Conceptual understanding	Conceptual understanding occurs when students grasp the mathematical ideas behind the procedures they use.	Conceptual understanding is not knowledge of isolated facts, procedures, or algorithms.
Contextualize	To contextualize occurs when a scenario is given to a number sentence or equation.	To contextualize is not a written representation of a number problem.
Decontextualize	To decontextualize occurs when a scenario is translated into a number sentence or equation.	To decontextualize is not to translate key words.
Discourse	Discourse is purposeful discussion that builds layers of meaning, connections, and understanding through questioning and sharing of ideas.	Discourse is not a one-way conversation or asking and responding to close-ended questions.
Distributed practice	Distributed practice is a process in which the teacher purposefully assigns a few problems over several days to promote acquisition and fluency in a newly taught math skill.	Distributed practice is not assigning many problems over a short period of time.
Evidence of student thinking	Evidence of student thinking is tangible, visible, or audible information that indicates what students have learned.	Evidence of student thinking is not just providing an answer to a question or problem without providing justification or explanation.
Multiple entry points	Multiple entry points of a task or problem allow various ways to think about a problem as well as a variety of solution strategies.	Multiple entry points is not a task or problem that has one path to a solution.
Multiple representations	Multiple representations are used to understand, develop, and communicate different mathematical features of the same object, problem, or operation, as well as make connections between various mathematical ideas.	Multiple representations are not used to focus on one way to think about a mathematical idea or to teach isolated representations without analyzing the connections.
Procedural fluency	Procedural fluency is the ability to apply procedures appropriately, accurately, efficiently, and flexibly.	Procedural fluency is not the application of rote procedures without conceptual understanding.
Rigorous tasks	Rigorous tasks engage students in reasoning at high levels, exploration, flexible thinking, and making connections.	Rigorous tasks are not more problems using difficult computation, with one answer or one way to get to the answer and without connection to the mathematics understanding.

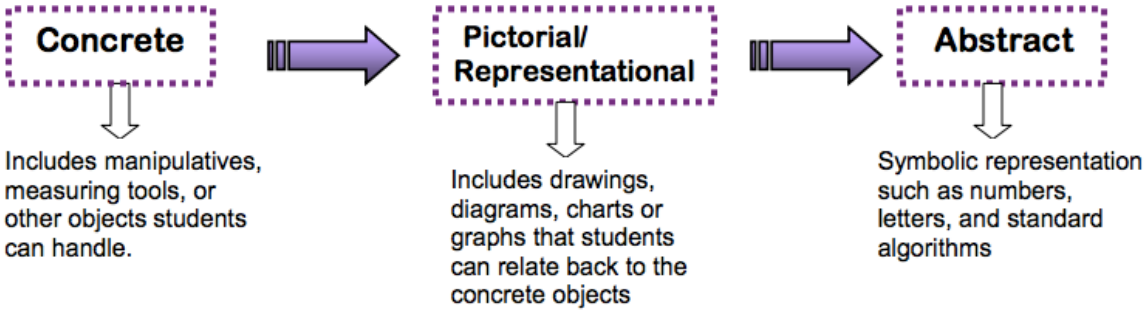
INSTRUCTIONAL MODEL

Overview

The instructional model for mathematics in the Concrete – Representational – Abstract Model (CRA) at all grade levels. The curriculum articulates this model to support how students learn mathematics.

Concrete – Representation – Abstract

Instruction in mathematics should follow 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 abstractly ("symbolic" stage). The CRA model allows students to develop conceptual understanding, so that they have a deeper understanding of the mathematics and are able to apply and transfer their understanding across concepts and content.



To support the CRA model through lesson delivery, in grades PK – 7, the lesson cycle follows a Math Workshop/Guided Math Lesson Cycle. Components of this lesson cycle include: Number Sense Routine, Task and Share, Focus Lesson, Guided Math, Workstations and Student Reflection. In grades 8 – 12, the components of the current lesson cycle include: engage, learning experiences, structured practice and closure. Formative assessment and math discussion occur throughout the cycle. These lesson cycle components allow teachers flexibility in how they implement the CRA instructional model to support all students.

Guided Math/Math Workshop

Guided Math is a framework for mathematics instruction. Within this framework lessons are created using the seven components which enable to students to gain a deeper conceptual understanding, computational fluency, and skilled in mathematical thinking (Samons, 2010).

Additional Instructional Considerations for Guided Math:

- A Classroom Environment of Numeracy
- Number Sense Routine
- Whole-Class Instruction
- Small-Group Instruction
- Math Workshop
- Math Conferences
- Balanced Assessments

SAMPLE LESSON CYCLES

Elementary Math Lesson Cycle - Grades PK – 5

Math Block Schedule - Guided Math Options

<table>
<tr><td colspan="3">Number Sense Routine (15 Minutes) One or more of the following should happen each day:</td></tr>
<tr><td><u>Problem of the Day</u>:

A good math problem is one in which the solution is not immediately obvious and that can be solved in multiple ways.

Be sure this time includes sharing students' strategies.

Address different problem solving types.</td><td><u>Number Talks</u>:

This is an opportunity for students to build fluency with numbers. In the primary grades, it involves graphic representations such as ten frames and dot cards to help students develop visual models for numbers, subitize, and see the relationships between numbers. As students begin to think about computation, Number Talks reinforces the movement of student thinking from counting, through derived strategies and ultimately to automaticity. In the intermediate grades, it continues to be important to give students opportunities to calculate mentally and to share strategies.

Follow the grade level scope and sequence.</td><td><u>Every Day Counts</u>:

This program offers daily review and practice of key math concepts. The strength of this program is in the discussion. It is better to spend time on a few components and allow time for discussion rather than superficially "covering" all of them.</td></tr>
<tr><td colspan="3">Whole-Class (15-45 minutes) One of the following happens at this time:</td></tr>
<tr><td colspan="2"><u>Mini-lesson</u> (15-20 minutes)
▪ Introduce a new workstation
▪ Pose an investigation
▪ Introduce a new skill or concept</td><td><u>Shared Experience</u> (45 minutes):
▪ Whole class instruction
▪ Hands-on materials
▪ Class discussion</td></tr>
<tr><td colspan="3">Work time (15-45 minutes) The following are happening simultaneously:</td></tr>
<tr><td colspan="2"><u>Teacher facilitated small group instruction</u>:
▪ Focused, differentiated instruction
▪ Intervention or remediation
▪ Enrichment</td><td><u>Independent small group/partner work or workstations</u>:
▪ Partners or groups work on the same investigation.
▪ Individuals, partners, or small groups move through workstations.</td></tr>
<tr><td colspan="3">Closure – Math Huddle (Sharing and reflecting) (15 minutes) This is more than a summary of the day's activities. It is an opportunity for students to communicate their mathematical ideas and justify their thinking. It is part of the learning experience. As such, the teacher should make purposeful choices, based on her/his observations during the work time, about who shares.</td></tr>
</table>

Secondary Math Lesson Cycle – Grades 6 and 7

Middle School Math Lesson Cycle

<table>
<tr><th colspan="2">Task and Share</th><th colspan="3">Focus Lesson, Guided Math, and Learning Stations</th><th colspan="2">Guided Math and Learning Stations</th></tr>
<tr><td>5 minutes</td><td>Number Sense Routine</td><td>5 minutes</td><td colspan="2">Number Sense Routine</td><td>5 minutes</td><td colspan="2">Number Sense Routine</td></tr>
<tr><td rowspan="2">25 minutes</td><td rowspan="2">Math Task</td><td>10 minutes</td><td colspan="2">Focus Lesson</td><td rowspan="2">45 minutes</td><td rowspan="2">Guided Math</td><td rowspan="2">Learning Stations</td></tr>
<tr><td>25 minutes</td><td>Guided Math</td><td>Learning Stations</td></tr>
<tr><td>15-20 minutes</td><td>Math Share and Student Reflection</td><td>5-10 minutes</td><td colspan="2">Student Reflection</td><td>5-10 minutes</td><td colspan="2">Student Reflection</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. Possible number sense routines: Number Talks, Count Around, Tell Me All You Know, Guess My Rule, Which One Doesn't Belong

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

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

Focus 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 Reflection – A deliberate and meaningful time for students to consider new learning

Secondary Math Lesson Cycle - Grade 8 and High School

High School Math Lesson Cycle

Movement through the CRA Model can be in multiple activities (i.e. starting with manipulatives, scaffolded into making connections to the representational component and then moving into the structured practice).

Lesson Components	Sample Activities	Timeframe
Engage	• Inquiry / Explore Concept • Pre-Task • Tell me all you know • Graffiti Wall • Which One Doesn't Belong • Quick Write	5 – 10 min

Learning Experiences
*Whole group strategies can also be used in small group instruction
 	
Follow the Upside Down Teaching Approach ("You do, We do, I do") where students use productive struggle to discover content.
	• Whole Group
	  • Discovery Lessons
	  • Rigorous Tasks
	  • Conceptual Learning Experiences (concrete)
	  • Questioning
	  • Feedback
	  • Manipulatives (concrete)
	  • Parallel Tasks
	• Small Group
	  • Workstations
	  • Feedback
	  • Manipulatives (concrete)
	  • Scaffolding
	  • Practice
		15 – 20 min

Structured Practice	*Practice could be structured in the following ways* • Guided (small group) • Partnered • Individual • Team – Pair – Solo • Solo – Pair – Consensus • Pairs Check	10 – 15 min
Check for Understanding **Should occur throughout the cycle*	• FACT Strategies • Formative Assessments • Rubics/Checklists • Extended Response Cards	*Should occur throughout the lesson cycle* *5-10 minutes*
Math Discussions **Should occur throughout the cycle*	• Think Alouds • Kagan Discussion Strategies • Error Analysis • Strategy Harvest	*Should occur throughout the lesson cycle.*
Closure	• Reflection • Summary - (POMS) • Quick Write	5 min

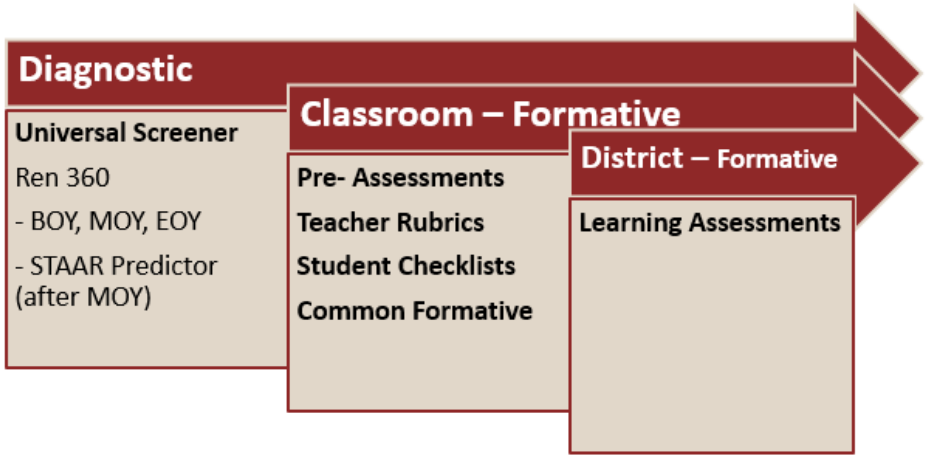
ASSESSMENT

Philosophy

FBISD believes in empowering and growing all learners by utilizing fluid feedback and reflective practice to determine *where students and educators are* and *where they are going* in the teaching and learning process.

A comprehensive math assessment plan informs the teacher and student by identifying a student's strengths and areas for growth through screening, monitoring, diagnostic, formative and summative assessment. A comprehensive assessment plan should involve a variety of assessments in order to enable evidence-based decisions and feedback on the part of the teacher and student to identify actionable and measureable instructional goals.

Framework



Diagnostic Assessments

Diagnostic assessments are typically administered prior to instruction and allows the teacher to determine a student's individual strengths, areas for growth and baseline skills. It is typically used to diagnose student difficulties and guide lesson development. In the FBISD math classroom, the primary diagnostic assessment is the Ren360 administered in grades K – 10 three times a year. This diagnostic assessment also includes the STAAR predictor report to support intervention planning.

Classroom Formative Assessments

Classroom Formative Assessments are the formal and informal procedures conducted by teachers during the learning process in order to modify and adjust instruction in order to increase student achievement. These can encompass a wide variety of tools from rubrics, checklists and common formative assessments. The purpose of the formative assessment process is to develop students as owners of their own learning through self and peer assessment that promotes goal setting, feedback and revision. There are samples of each type of assessment included in the mathematics curriculum. Professional Learning Communities should collaborate to develop classroom based formative assessments to monitor and provide feedback on identified student needs.

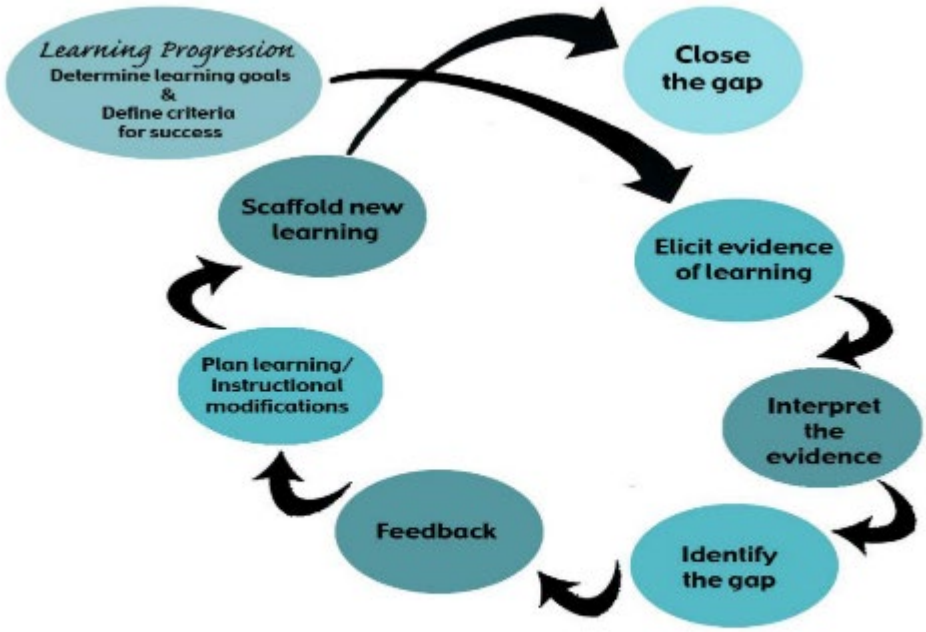
District Formative Assessments

District formative assessments are called Learning Assessments which are given to Grades K – 12 in all core content areas, a minimum of two times throughout the course of the school year. Learning Assessments have a narrow focus aligned to the FBISD curriculum. Learning progressions that are assessed on learning assessments are identified using a data review process. Each progression represents high leverage learning progressions within a course. The purpose is to measure growth along the learning progression.

ASSESSMENT TOOLS

Formative Assessment Cycle

The formative assessment cycle is a process used by students and teachers during instruction that provides feedback to adjust instruction in order to improve students' understanding of intended learning intentions.



Margaret Heritage's "Formative Assessment Model" (2009a, 2009b, 2010).

The Formative Assessment Leadership Tool

The Formative Assessment Leadership Tool defines key actions at each stage of the cycle and is utilized by administrators and teachers to monitor and guide professional decisions and student engagement through the formative cycle.

Formative Assessment Cycle Phases	Teacher Action	Student Action(s)	Leadership Action(s) & Look Fors
Learning Progression – Determine Learning Intentions & Success Criteria	(PLC): - Accesses the curriculum. - Uses learning progressions to collaboratively identify learning intentions and success criteria for the unit and identified lessons. <u>During Instruction, teachers will:</u> - Clearly articulate the learning intention and purpose for learning. - Clearly articulate the success criteria in relation to a product, performance, or process.	Understand and are able to communicate what they are learning and how they will know they are successful. <u>Students can answer these questions:</u> - *What am I learning?* - *Why am I learning it?* - *How will I know when I am successful?*	<u>Action(s):</u> - Allocate or identify collaborative time for PLCs. - Set expectations for PLC work. - Access the curriculum to determine alignment of LI & SC. - Reinforce the district's common language around formative assessment. <u>PLC Look Fors:</u> - PLC accesses curriculum to review learning progressions. - PLC develops agreed upon learning intentions & success criteria. <u>Instructional Observation(s):</u> - Learning intentions and success criteria are referenced/accessed by students and teachers throughout the lesson. - Every aspect of the lesson is connected to the learning intention. - The success criteria clearly describe what success looks like in student work in regards to this learning intention.

Elicit Evidence of Learning	(PLC): - Accesses the curriculum. - Collaboratively develop/identify a formative task (product, performance, or process) that allows students to demonstrate success. <u>During instruction, teachers will:</u> - Provide opportunities for students to demonstrate understanding of LI. - Gather and track evidence of student learning. - Identify exemplars that evidence success.	Use success criteria to self – peer assess student work. <u>Students can answer these questions:</u> - *Where am I in relation to the learning intention?*	<u>Action(s):</u> - Emphasize the effectiveness of formative assessment. - Emphasize the importance of using examples and non-examples for students – appropriate use of student work. - Ensure formative tasks are aligned with the LI. - Provide feedback to teachers related to the facilitation of self and peer assessment. <u>PLC Look Fors:</u> - PLC accesses curriculum documents to plan formative tasks. - PLC chooses formative tasks aligned with the learning intention. - PLC discusses how/what success will look like in student work. <u>Instructional Observations:</u> - Models of success are explicit & evident in the classroom. - There are multiple ways for students to demonstrate success. - Teachers are collecting evidence/tracking student progress. - Success Criteria are used by students during the self and peer assessment processes.
Interpret the Evidence	(PLC): - Collaboratively review student work to identify student strengths and areas for growth. <u>During instruction, teachers will:</u> - Examine the evidence in relation to the success criteria to determine what the student understands and to identify misconceptions. - Facilitate student understanding of evidence.	Analyze personal work to identify strengths and areas for growth. <u>Students can answer these questions:</u> - *What did I do well?* - *What do I need to work on?*	<u>Action(s):</u> - Encourage teachers to support their thinking with evidence. - Support teachers in learning from each other and monitoring their effect size. - Provide affirmation and celebration of staff effort. - Identify teachers who are getting excellent results. <u>PLC Look Fors:</u> - PLC reviews student work collaboratively looking for evidence of learning. - PLC identifies students' strengths and weaknesses, supporting their thinking with evidence.

			Instructional Observations: - Teachers encourage and facilitate student analysis of work promoting the use of evidence to determine strengths and areas for growth - Feedback is timely, specific, and aligned to success criteria.
Identify the Gap	(PLC): - Collaboratively place students on the learning progression based on strengths and weaknesses noted in their work - During instruction, teachers will: - Interpret evidences gathered of student learning to identify the gap and infer areas of focus to move students up the learning progression	Identify where they are on the learning progression and identify next steps for learning. Set goals Students can answer these questions: - *What are my next steps in learning?* - *What do I need to do to achieve success?*	Action(s): - Lead teachers in identify areas in which students are having the most trouble. - Provide teachers with the resources, materials and support to help them succeed. - Identify problem areas – plan PD. PLC Look Fors: - PLC places students into groups based on their needs. Instructional Observations: - Students engage in goal setting. - Students revise their work based on feedback.
Feedback	(PLC): - Determine feedback that will be given to students. During instruction, teachers will: - Reference success criteria when providing feedback to students. - Provide students with specific, actionable feedback that will move them up the progression.	Peers use the success criteria to provide feedback. Students are engaged in metacognition, reflecting on their own learning using the success criteria? Students can answer these questions: - *What evidence do I have to determine if I have reached my goal?* - *What feedback have I received and how have I used it?*	Action(s): - Provide teachers with feedback on the PLC process. - Encourage a culture of high expectations, collaboration, and continuous improvement. - Assist teachers in providing appropriate feedback. PLC Look Fors: - Feedback developed is timely, specific, understandable and actionable. Instructional Observations: - Feedback is used to make real time instructional changes in teaching, check misconceptions and fill gaps in learning. - Teacher uses success criteria to provide feedback. - Teacher elicits feedback from students about their current thinking to inform lesson planning and assessment. - Learner thinking is monitored via student feedback.

			- Students seek and provide task and knowledge specific feedback. - Time is built into lesson for students to reflect on feedback.
Plan Learning/ Instructional Modifications	(PLC): - Access the curriculum for ideas to support intervention and enrichment. - Determine differentiated learning experiences that will move all students forward on the learning progression. - Plan for responsive instruction according to identified needs. <u>During instruction, teachers will:</u> - Reflect on best learning experiences/strategies to use to address student needs.	Students take ownership of their learning by creating a plan for improvement. Students revise work. <u>Students can answer these questions:</u> - *What am I going to do to learn this?* - *When will I do this?* - *Who can help me?* - *What tools will help me?* - *What can I do to show that I have learned this?*	<u>Action(s):</u> - Access the curriculum for ideas to support intervention and enrichment. - Create school wide systems of intervention- utilize responsive instruction. - Systems must be a directive, not an invitation. <u>PLC Look Fors:</u> - PLC collaborates to plan learning experiences for various groups of students based on their gaps. <u>Instructional Observations:</u> - Students take responsibility for the pace of the lesson. - Students use academic language to talk/write about their learning. - Students revise their work. - Students connect effort and achievement.
Scaffold New Learning	(PLC): - N/A <u>During instruction, teachers will:</u> - Modify/Scaffold instruction to move students up the progression. - Utilize responsive instruction to differentiate the learning experiences according to identified student needs.	Students are responsive in the process of scaffolding, using feedback and their own learning strategies in collaboration with the teacher's instruction. <u>Students can answer these questions:</u> - *Has what I have been doing to reach my goal been working?* - *Are there any changes I need to make that might help me reach my goal?*	<u>Action(s):</u> - Responsive Instruction actions - Help teachers reflect on where they are at in the formative assessment process; what are their strengths; what do they need to work on; and how can they close the gap. <u>PLC Look Fors:</u> - N/A <u>Instructional Observations:</u> - Learning is aligned to the progression, but differentiated according to student needs. - Teachers prompt student learning with appropriately leveled questions. - Students monitor their learning. They ask questions and work independently on increasingly complex tasks.

Learning Progressions

Learning Progressions are the purposeful sequencing of teaching and learning expectations across multiple developmental stages, ages, or grade levels. The term is most commonly used in reference to learning standards—concise, clearly articulated descriptions of what students should know and be able to do at a specific stage of their education. Students are able to utilize this tool to self and peer assess in order to provide reflect and provide feedback on their progress in order to become owners of their learning. Teachers are able to assess and provide feedback to students on their learning as well as determine next steps for enrichment or intervention in order to move students toward growth. A sample learning progression is shown below.

Learning Progression	"Developing"	"Progressing"	"Proficient"	"Advanced"
Determine and analyze key features of linear, quadratic and exponential functions.	Students will evaluate and identify linear, quadratic and exponential functions from multiple representations.	Students will identify key attributes of linear, quadratic and exponential functions from multiple representations.	Students will explain, describe and compare key attributes from graphs of linear, quadratic and exponential functions from multiple representations.	Students will make predictions about linear, quadratic and exponential functions using key attributes.

Rubrics and Checklists

Rubrics and Checklists are tools utilized by students to provide specific success criteria and allow teachers and students to collect information in order to make decisions about what students know and are able to do in relation to the learning intention and success criteria. A sample checklist is shown below.

	Self-Assessment		
I can....	No	Sometimes	Yes
Read the problem multiple times.			
Make sense of the problem: • Do I know what information was given? • Do I know what I am being asked to solve?			
Predict a reasonable solution.			
Choose an appropriate strategy to solve.			
Choose appropriate math tools.			
Model with multiple strategies such as: tables graphs drawings equations verbally diagrams			
Ask: "Does my answer make sense?"			
Use appropriate math vocabulary.			
Explain why my answer is correct.			

INTERVENTION AND ENRICHMENT MODELS

Equitable and Viable Curriculum

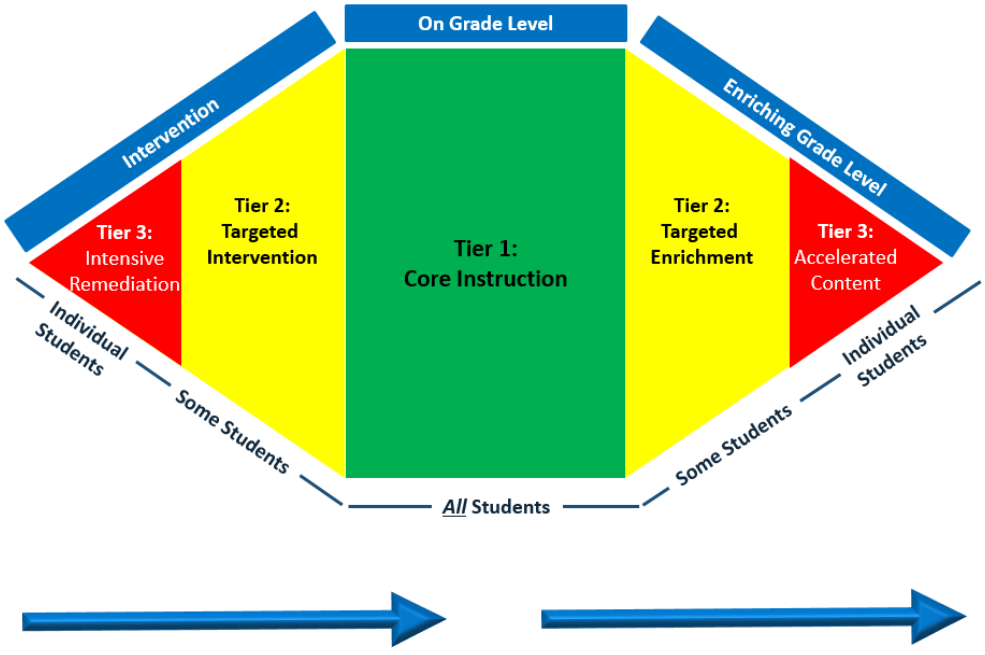
The FBISD K – 7and 8 – 12 Math Instructional Models provide ALL students access to High-Quality Tier 1 instruction through rigorous math tasks that allow for multiple entry points, rich math discussions, peer assessment, oral and written feedback, and meaningful student self-reflections. The revised curriculum components support student-centered, differentiated instruction and promote student ownership of their learning. The new Curriculum components provide a balanced assessment approach including pre-assessment topics, common formative assessments, rubrics, and student checklists aligned to learning progressions. Clear learning intentions and success criteria engage students as owners of their own learning who can communicate and interact with content as critical thinkers and self-motivated learners.

Tiered Instructional Model Overview

The FBISD K – 7and 8 – 12 Math Instructional Models provide ALL students access to High-Quality Tier 1 instruction through rigorous math tasks that allow for multiple entry points, rich math discussions, peer assessment, oral and written feedback, and meaningful student self-reflections.

Tier 2 and 3 supports are provided to students who have/have not mastered grade level concepts. In FBISD, this is referred to as intervention/enrichment. The classroom teacher gives Tier 2 targeted, intervention support through guided math groups, learning stations, and digital interventions. The elementary master schedule has a built-in staggered intervention time for each grade level for Tier 2 & 3 interventions. At the middle and high school level, Tier 3 students receive intensive intervention by enrolling in a Math Lab or Blocked course designed to teach foundational skills and bridge the learning gaps.

Additionally, Tier 2 and 3 supports are extended to students who have demonstrated mastery of grade level concepts before the end of a unit. Enrichment students are provided opportunities to extend their learning in small group settings by engaging in enriched, challenging learning experiences that are designed to help them make deeper connections to the lesson content.
The graphic below depicts this tiered instructional model.



Tiered Instructional Model Outline

The tiered instructional model is outlined below and describes who is targeted for each tier, what content is to be covered, and the model for intervention.

Tier	Who & What	What – Instructional Practices	Model	When /Where	Examples
I	**All students** **Grade level content** from the curriculum	Core instruction aligned to the instructional model, includes differentiation	Provided by the classroom teacher Instructional arrangement determined to support content acquisition (whole group, small group, 1:1)	During the assigned instructional class	Inquiry based instruction based on the CRA model and using the defined lesson cycles in math Reengagement activities
II	Identified Students **Grade level content** from the curriculum	Small Group, targeted instruction for students who need additional exposure to grade level content before mastery	Provided by the classroom teacher **or** interventionist Small Group 5 – 8 students	During the assigned instructional/intervention class Could include a modified master schedule or classroom arrangement	Small Group Instruction Intentional Grouping Push in – determined by data and the number of students in need
III	Identified Students **Remedial** content	Individualized/ smaller group intensive instruction/intervention	May be provided by the classroom teacher **or** interventionist Small Groups 1 – 3 students	During the school day <u>Requires master schedule adjustments:</u> Push in model preferred Pull out model as an option	Push in model Pull out model (should not to disrupt ongoing content instruction) Secondary: Block Algebra I/ Math Lab Classes

- ***Interventions should be provided during the school day.*** Tutorials should be offered as part of the instructional responsibility of teachers aligned to student need and voluntary. There are specific times when organized tutorials can be utilized to target identified student needs based on data.
- The push in model is used to maximize ongoing content instruction and can be utilized in a variety of ways:
  - Utilize interventionist/specialist for small group or one-on-one in class support
  - Flexible grouping – share students among grade level teachers for re-teaching
  - Teacher pulls small groups during last 15 minutes of class period for targeted instructio

Tier I Instructional Practices

In Tier I, **ALL students** have **access** to essential grade level academic and behavior standards through high quality differentiated classroom instruction by the classroom teacher. **Access** refers to all students receiving differentiated instruction through the instructional model, monitoring progress through formative assessments, and utilizing actionable feedback to take ownership of their learning. Components of Tier I instruction include:

- A focus on relationship building and establishment of a risk-free environment.
- Well-designed lessons following the Guided Math or CRA instructional model
- Individual and collaborative teacher teams identify and post learning intentions and success criteria as outlined in their FBISD curriculum documents for students to interact with.
- Highly engaging lessons that motivate and engage all students.
- Additional time for re-engagement is given to individual students as needed.
- Rigorous lessons at various cognitive levels.
- Sheltered instruction strategies are used with English language learners.
- Individual SPED and ELL accommodations are made to support student needs.
- Lesson delivery in a variety of instructional formats including utilizing the CRA Model as well as the Guided Math/Math Workshop lesson cycle.
- Use of a variety of conceptual representations and learning styles to reach all students.
- Connecting learning to the Profile of a Graduate and 21st century skills.
- Various methods of grouping to meet individual student needs.
- Blended learning models are used to engage students as well as lead students to research and produce their own products.
- Opportunities to show mastery and engage in instruction through small group purposeful talk.
- Multiple quick formative assessments are used throughout lessons.
- Data from formative assessments and multiple forms of classroom data (such as diagnostic assessments, anecdotal records, curriculum-based assessments, Learning Assessments, etc.) are used to guide instruction.

Tier II Instructional Practices for Intervention

In Tier II, targeted students receive additional **support** to **access** or **enrich** grade level academic and behavior standards. This targeted instruction is determined by various forms of data. **Support** refers to the additional scaffolds and time on task we offer to targeted students within our instructional model to set them up for success. Tier II students will still receive Tier I instruction. **Enriching** grade level standards involves offering more complex, challenging situations for students to apply their learning. Students may be asked to apply or transfer ideas, concepts, or skills into more abstract or novel contexts to think about the implications.

Students who are performing at Tier II levels will receive strategic instruction as follows:

- Students who do not master essential standards that are introduced during Tier I instruction receive Tier II intervention support until reaching mastery of those standards.
- Formative and common assessments are used to identify students in need of Tier II intervention support.
- Classroom teacher generally provides Tier II intervention through small group instruction or push in models, but collaborative teacher teams or math interventionists may also work together to provide Tier II interventions.
- Parents should be notified that their child is receiving supplemental intervention, along with ways in which they can assist at home.

Tier III Instructional Practices for Intervention

In Tier III, targeted students receive **intensive support** to master foundational skills or to **enrich** grade level academic or behavior standards. Just like Tier II, instruction for Tier III is determined through data. These students need support to master skills that are outside the grade level content. Intensive support may be offered outside of the classroom at other times during the day, but the student may still be in the classroom for Tier I instruction and will continue to receive Tier I instruction and support. Other times, the student may receive Tier III supports in the classroom, and the teacher will offer instruction around foundational skills or enrichment.

Students who are performing at Tier III levels will receive strategic instruction as follows:

- Tier III is designed to be at least 6 weeks in length
- Intensive interventions for students who are not responding to Tier I and II interventions and/or have performed significantly low on universal screeners and assessments
- One-to-one and small group interventions
- Frequent, targeted and systematic
- Math Lab or blocked math classes can be utilized for Tier III intervention
- Usually provided by a specialist as determined by School Support Team
- Parents should be notified that their child is receiving intense intervention, along with ways in which they can assist at home
- School Support Team should meet every 4 – 5 weeks to analyze intervention effectiveness and determine next steps

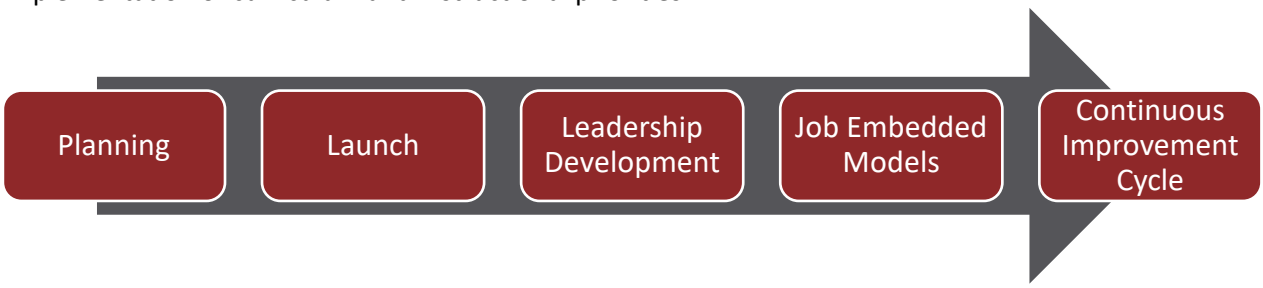
PROFESSIONAL LEARNING PLAN

Planning and Implementation Process Overview

Fort Bend ISD provides professional learning through various avenues to support the implementation of the K – 12 math curriculum and instructional best practices for the mathematics classroom. Professional learning experiences can take the form of face-to-face, blended, and online learning experiences. Teachers and leaders participate in a job embedded professional learning path(s), which promote ongoing and relevant learning experiences to support implementation of the K – 12 math curriculum.

Professional Learning Planning Cycle Timeline & Implementation Stages

The graphic below shows the stages of planning and implementation of professional learning to support implementation of curriculum and instructional priorities.



The chart below details the purpose and timeline for each stage.

Implementation Stage	Definition/Purpose	Timeline
Planning	The purpose of the planning stage is to engage in data analysis, identify goals and student outcomes to drive the development of the professional learning plan.	11 months prior to launch an instructional priority
Launch	The purpose of the launch is to deliver a series of initial learning experiences with identified stakeholders to communicate common messaging specific to instructional priorities.	Between three months to one year depending on the instructional priority
Leadership Development ***Goal:*** *build capacity at all levels of the organization to support implementation*	**Central Office/Campus Administrators** engage in ongoing professional learning to support and lead the implementation of the instructional priority.	Ongoing throughout implementation
	Teacher leaders engage in ongoing professional learning to support campus implementation and create lab classroom environments to model instructional practices.	
	Campus support leaders engage in ongoing professional learning to promote common messaging and utilize campus structures to build capacity in teachers.	

Job Embedded Supports ***Goal:*** *to provide ongoing, differentiated professional learning for teachers*	**Blended Learning** – provides flexibility to reinforce, sustain, or extend learning.	Ongoing throughout implementation
	Peer Observation – topic based guided observations to promote teacher reflective practice.	
	Instructional Coaching – campus based coaching cycle that includes support for planning, observations/modeling, and reflection.	
	Professional Learning Community Protocols – protocols designed to facilitate learning, planning instruction, and data review.	
Continuous improvement cycle	The process of evaluation is to formatively monitor, gather evidence of the fidelity of implementation, provide continuous feedback, and adjust support to refine practice.	Ongoing throughout implementation

To support the implementation of PK-12 Math Plan the following plan has been developed. Professional learning topics are presented to teachers, math specialists, interventionists, instructional coaches, and administrators to support the implementation of the plan.

Professional Learning Opportunities

The professional learning opportunities listed in the chart below provide focused learning venues for the following individuals:

Audience	Purpose	Description of Specific Opportunities
All teachers	All PK – 12 math teachers are open to attend and trainings cover a variety of topics. Provide continued learning in the implementation and use of the FBISD PK – 12 math written, taught and tested curriculum as well as other district initiatives.	• Required summer professional learning • After School Professional Learning (Learning Assessment Open Labs, Math Content Training, etc.) • Job embedded observations and modeling
Teacher Leaders	Representatives are selected at the campus level. Provide consistent messaging to all campuses regarding curriculum, instruction and assessment. Participants focus on the development of content knowledge support and Professional Learning Community facilitation in order to apply their learning at their respective campus.	• Team Leader Training • Department Head Training • Math Specialists/ Interventionists/Instructional Coaches Training
Cadre Members	Teachers who have elected to participate in professional learning specifically designed to focus on the implementation of an instructional model. Participants in these cadres learn how to design instruction aligned to the instructional model and are expected to	• Guided Math • Additional cadres are developed as needed

	create a lab classroom environment to promote job embedded professional development to model instructional practices for their content area focus.	

Implementation Plan for Professional Learning

Three learning strands will ensure effective math instructional practices are in place for all students. The learning strands are: Instructional Model, Tiered Instruction, and Formative Assessment. The table below describes the Professional learning plan for each priority. See **Appendix A** for a more detailed outline of the plan.

Implementation Stage	Instructional Model	Tiered Instruction	Formative Assessment
Planning	Revise the curriculum to include the instructional model and exemplar lessons Plan focused training on Number sense routines and reflective closure to transition teachers from the current lesson cycle to the Guided Math/Math Workshop lesson cycle	Revise the curriculum to include components related to the Profile of a Graduate, blended learning, Tier I, II and II interventions and enrichment Plan training for teachers on how to plan for tiered instruction using data	Revise the curriculum to include rubrics, checklists and formative assessment tools to use in the cycle Develop a formative assessment tool to support teachers and administrators in evaluating implementation Plan formative assessment training to empower teachers to develop student ownership
Launch	Provide initial teacher training around the instructional model. Guided Math year 1 teacher cadre(s) Include in the curriculum, model lessons that follow the instructional model	Provide initial teacher training around components related to the Profile of a Graduate, blended learning, Tier I, II and II interventions and enrichment Include blended learning model lessons	Provide initial teacher training around formative assessment tools Provide examples of rubrics, checklists and formative assessment tools (including CRA assessments) in identified units in K-12.

Leadership Development	Include topics related to the instructional model in teacher leader meetings (Department Chair, Team Leader, Instructional Coaches/ Specialists) Year 2 and Year 3 Guided Math Cadre(s)	Include topics related to the tiered instruction in teacher leader meetings (Department Chair, Team Leader, Instructional Coaches/ Specialists)	Include topics related to formative assessment in teacher leader meetings (Department Chair, Team Leader, Instructional Coaches/ Specialists) Provide support using the Formative Assessment Leadership Tool with departments/ PLC
Job Embedded Supports	Instructional coaching support at identified campuses, blended learning opportunities through the use of Schoology, PLC supports Utilize Guided Math Cadre Members (Year 2 or 3) as lab classrooms	Blended learning opportunities through the use of Schoology Math interventionists provide teacher support at identified campuses Provide PLC protocols for planning tiered instruction	Instructional coaching support at identified campuses Provide PLC protocols for use in the formative assessment cycle Use of the Formative Assessment Leadership Tool to monitor and assess PLC progress in the Formative Assessment Cycle
Continuous improvement cycle	Feedback provided through teacher review of curriculum and the curriculum review survey administered twice a year Provide continued training on the components of the lesson cycle to enhance and refine instructional practice Establish training modules for new teachers to FBISD	Provide continue training on curriculum supports to enhance and refine instructional practice Feedback provided through teacher review of curriculum and curriculum review survey administered twice a year Establish training modules for new teachers to FBISD	Provide continue training on formative assessment to enhance and refine instructional practice Enhance and refine curriculum supports regarding formative assessment based on feedback from the curriculum review survey Establish training modules for new teachers to FBISD

IMPLEMENTATION TIMELINE

Planning and Implementation Timeline of the PK – 12 Math Plan

To support the implementation of PK-12 Math Plan, the following timeline has been developed. Throughout the implementation process, a focus will be placed on ensuring a connection between the resource philosophy, technology integration plans and philosophy, and professional learning modules.

Year 1	Year 2	Year 3
Curriculum Development: • Refine the curriculum to provide tools for teachers to support implementation of the instructional model, tiered instruction, and formative assessment **Professional Learning:** • Launch long – term professional learning plan • Establish Guided Math Cadre • Train teachers and leaders on the guiding principles • Train teachers and leaders on the components of the curriculum that support implementation of the instructional model, tiered instruction, and formative assessment **Leadership Development:** • Develop tools to support teacher and campus leaders in supporting, monitoring, and providing feedback on implementation • Establish job embedded models to build capacity at the campus level • Identify and support lab classrooms **Feedback Systems:** • Review & revise feedback protocols to	**Curriculum Development:** • Refine curriculum and support tools based on feedback from stakeholders **Professional Learning:** • Develop and deliver year 2 learning to support the CRA model and Guided Math Implementation at identified grade levels • Establish guided observation protocols for use in lab classrooms • Launch Guided Math initial training for 8, Alg. I, Geom. teachers • Continue Guided Math Cadre • Develop modules for K – 8 new teachers **Leadership Development:** • Engage leaders in deep dive learning projects to support identified components of the math instructional model • Utilize learning walks to provide feedback on degree of implementation • Continue/expand Job embedded supports to include guided observations **Feedback Systems:** • Establish evaluation system for Professional	**Professional Learning:** • Continue implementation of professional learning long term plan to support Guided Math implementation • Expand job embedded supports peer to peer coaching **Leadership Development:** • Develop and implement teacher leadership pathways • Utilize lab classrooms in guided observations • Develop video exemplars of practice using lab classrooms • Develop Modules for New teacher training for High School Teachers **Feedback Systems:** • Evaluate fidelity of implementation using developed systems

support continuous improvement and refine curriculum / professional learning supports	Learning that analyzes teacher implementation of learning • Engage teachers and leaders in venues to provide feedback on curriculum and professional learning supports	

APPENDIX A – PROFESSIONAL LEARNING PLAN

	PK - 5	6, 7	8, Algebra 1, Geometry	3rd and 4th Year Math Courses
Guided Math Implementation Timeline	Deepen implementation	Launch 2018-19	Launch 2019-20	Launch 2020-21

2018 – 2019 Professional Learning Plan

PK – 5 Deepen Implementation	6, 7 Launch	8, Algebra 1, Geometry Planning	3rd and 4th Year Math Courses – Planning
Audience: Guided Math Cadres • Year 1 • Year 2 After School PD Summer PD Math Specialists Math Interventionists Math Instructional Coaches Campus Admin **Focus:** • Setting Up Guided Math • Planning for Small Group Instruction • Task and Share • Rigorous learning stations • Number Sense Routines • Content Knowledge • Assessment	**Audience:** Guided Math Cadre • Year 1 After School PD Summer PD Math Specialists Math Instructional Coaches Campus Admin Team Leads Department Heads **Focus:** • Setting Up Guided Math • Planning for Small Group Instruction • Task and Share • Rigorous learning stations • Reflective Closure • Number Sense Routines • Content Knowledge • Assessment	**Audience:** After School PD Summer PD Math Specialists Math Instructional Coaches Campus Admin Team Leads Department Heads **Focus:** • Number Sense Routines • Reflective Closure • Planning for Small Group Instruction • Content Knowledge • Assessment	**Audience:** After School PD Summer PD Math Specialists Math Instructional Coaches Campus Admin Team Leads Department Heads **Focus:** • Reflective Closure • Content Knowledge • Assessment

2019 – 2020 Professional Learning Plan

PK – 5 Deepen Implementation	6, 7 Deepen Implementation	8, Algebra 1, Geometry Launch	3rd and 4th Year Math Courses – Planning
Audience: Guided Math Cadres • Year 1 • Year 2 • Year 3 After School PD Summer PD Math Specialists Math Interventionists Math Instructional Coaches Campus Admin **Focus:** • Setting Up Guided Math • Planning for Small Group Instruction • Task and Share • Rigorous learning stations • Number Sense Routines • Content Knowledge	**Audience:** Guided Math Cadre • Year 1 • Year 2 After School PD Summer PD Math Specialists Math Instructional Coaches Campus Admin Team Leads Department Heads **Focus:** • Setting Up Guided Math • Planning for Small Group Instruction • Task and Share • Rigorous learning stations • Number Sense Routines • Reflective Closure • Content Knowledge	**Audience:** Guided Math Cadre • Year 1 After School PD Summer PD Math Specialists Math Instructional Coaches Campus Admin Team Leads Department Heads **Focus:** • Setting Up Guided Math • Planning for Small Group Instruction • Task and Share • Rigorous learning stations • Number Sense Routines • Reflective Closure • Content Knowledge	**Audience:** After School PD Summer PD Math Specialists Math Instructional Coaches Campus Admin Team Leads Department Heads **Focus:** • Reflective Closure • Content Knowledge • Planning for Small Group Instruction • Number Sense Routines

PK – 5 Deepen Implementation	6, 7 Deepen Implementation	8, Algebra 1, Geometry Deeper Implementation	3rd and 4th Year Math Courses - Launch
Audience: Guided Math Cadres • Year 1 • Year 2 • Year 3 After School PD Summer PD Math Specialists Math Interventionists Math Instructional Coaches Campus Admin	**Audience:** Guided Math Cadre • Year 1 • Year 2 • Year 3 After School PD Summer PD Math Specialists Math Instructional Coaches Campus Admin Team Leads Department Heads	**Audience:** Guided Math Cadre • Year 1 • Year 2 After School PD Summer PD Math Specialists Math Instructional Coaches Campus Admin Team Leads Department Heads	**Audience:** Guided Math Cadre • Year 1 After School PD Summer PD Math Specialists Math Instructional Coaches Campus Admin Team Leads Department Heads
Focus: • Setting Up Guided Math • Planning for Small Group Instruction • Task and Share • Rigorous learning stations • Number Sense Routines • Content Knowledge	**Focus:** • Setting Up Guided Math • Planning for Small Group Instruction • Task and Share • Rigorous learning stations • Number Sense Routines • Reflective Closure • Content Knowledge	**Focus:** • Setting Up Guided Math • Planning for Small Group Instruction • Task and Share • Rigorous learning stations • Number Sense Routines • Reflective Closure • Content Knowledge	**Focus:** • Setting Up Guided Math • Planning for Small Group Instruction • Task and Share • Rigorous learning stations • Number Sense Routines • Reflective Closure • Content Knowledge

Note: *Professional learning plans will be reviewed and adapted yearly by the Teaching and Learning Division.*

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