

## Kindergarten STEM Outclass Overview 2022-2023

This document is designed to provide parents/guardians/community an overview of the curriculum taught in the FBISD classroom. This document supports families in understanding the learning goals for the course, and how students will demonstrate what they know and are able to do. The overview offers suggestions or possibilities to reinforce learning at home.

Included at the end of this document, you will find:

- A [glossary](#) of curriculum components
- The content area [instructional model](#)
- [Parent resources](#) for this content area

To advance to a particular grading period, click on a link below.

- [Grading Period 1](#)
- [Grading Period 2](#)
- [Grading Period 3](#)
- [Grading Period 4](#)

### 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.

TA1.B- Create original products using a variety of resources

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TA1.C explore virtual environments, simulations, models, and programming languages to enhance learning

TA2.D select, store, and deliver products using a variety of media, formats, devices, and virtual environments

TA4.C evaluate products prior to final submission

TA5.A adhere to acceptable use policies reflecting appropriate behavior in a digital environment

TA5.B comply with acceptable digital safety rules, fair use guidelines, and copyright laws

TA5.C practice the responsible use of digital information regarding intellectual property, including software, text, images, audio, and video

TA6.B use appropriate digital tools and resources for designing solutions to problems

MK.1A- apply mathematics to problems arising in everyday life

MK.8A- collect, sort and organize data into 2 or 3 categories

SK.3A- identify and explain a problem and purpose a task and solution for the problem

MK.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

MK.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

MK.8B- Use data to create real-object and picture graphs

<b>Grading Period 1</b> <b>Unit 1: Introduction to the STEM Lab</b> Estimated Date Range: August 10 – October 7 Estimated Time Frame: 4 Class Periods	
<b>Unit Overview:</b> In this unit, Kindergarteners are introduced to STEM Outclass. They will learn and practice classroom routines, procedures, and safety guidelines. They will learn to properly use the iPad and how to log-on to the district network. They will begin practicing skills that allow them to own their learning. Digital Citizenship, internet safety, and lab safety are taught in context with each lesson as required. Virtually, they will review proper use of devices and how to log-on to the district resources, as well as learn how to navigate through a variety of online resources that will be utilized for at home / online learning. Such resources include accessing the district's Learning Management System, Schoology and adding content to a Discussion Board in Schoology.	
<b>At home connections:</b> <ul style="list-style-type: none"> <li>Discuss ways your child can practice good digital citizenship when online at home.</li> <li>Have your child demonstrate how they upload items such as pictures or text to a discussion board in Schoology.</li> </ul>	
<b>Concepts within Unit #1</b> <a href="#">Link to TEKS</a>	<b>Success Criteria for this concept</b>
Concept #1: Routines, Procedures and Safety SK.1A	<ul style="list-style-type: none"> <li>Identify safe and non-safe behaviors in the STEM Lab</li> <li>Engage in the role of a "Driver" and "Navigator" when working in partners</li> <li>Navigate through an iPad in taking, finding and favoriting a picture.</li> </ul>
<b>Unit 2: Fundamentals of Computational Thinking</b> Estimated Date Range: August 10 – October 7 Estimated Time Frame: 4 Class Periods	
<b>Unit Overview:</b> In this unit, Kindergarteners are introduced to computational thinking using algorithms. Algorithms are a sequence of steps used to accomplish a task and solve problems. Students learn the fundamental skills of following directions using algorithms that are applied in everyday life, engineering design projects, coding and programming projects, as well as digital media. Students will identify directional commands such as left, right, up, down, forward, backward, diagonal, and ordinal directions such as first, second, etc. in order to follow simple steps to accomplish everyday tasks. Using the appropriate terms and following a set of directions, students will apply their knowledge of algorithms to computer programming and the engineering design process to solve problems. Students will be introduced to the engineering design process in steps (making the connection to algorithms) with a culminating project that allows students to solve a problem by engineering a way for objects to move from one place to another. The math and science concepts of direction (K.6C science) and data collection (K.8A).	
<b>At home connections:</b> <ul style="list-style-type: none"> <li>Have your child create a set of directions from getting one place to another. For example: Start in the kitchen – take 5 steps forward – turn right – enter the living room.</li> <li>Review directional words such as up, down, left, right, forward, backward with your child.</li> </ul>	
<b>Concepts within Unit # 2</b> <a href="#">Link to TEKS</a>	<b>Success Criteria for this concept</b>
Concept #1: Using Algorithms to Solve Problems TAK.4A	<ul style="list-style-type: none"> <li>Students can follow a list of steps</li> <li>Students can create a list of steps</li> <li>Students can be a positive a helpful partner</li> <li>Use the basic functions of an iPad</li> </ul>

- Students can use the Engineering Design Process to solve a problem.

## Grading Period 2

### Unit 3: Applying Computational Thinking with Algorithms

Estimated Date Range: October 11 – December 16

Estimated Time Frame: 8 Class Periods

#### Unit Overview:

Students will continue to develop the skills of following directions using algorithms that are applied in everyday life, engineering design projects, coding and programming projects as well as digital media.

Kindergarten students will continue to build on computational thinking to solve problems and create sequences, but in this grading period, students will be able to use algorithms to solve multi-step problems. Multi-step problems in coding / computer science are problems that will require more than one solution (coding block, algorithms, etc.) for it to function. In this unit, students will also apply the concept of persistence which is “trying again and again, even when something is very difficult”, brain storming which is “a group discussion to produce ideas or solve problems” and adaptability which is “the quality of being able to adjust to new conditions.”

In this unit, students will engage with “Hands on Learning” by using the physical environment to explore computing concepts. Students will also be able to create algorithms using visual block-based programming languages.

Kindergartners will work with sequences and directions. As mentioned from the previous unit:

- Sequence- set of logical steps carried out in order
  - Ex: Creating a set of directions (arrows) to get the Flurb to a piece of fruit on grid paper.
  - Ex: Inputting a series of directions into Beebot or Code-A-Pillar to get to a specific location on the mat.

Students will also continue to build their debugging skills as they are working through algorithms and engaging in the EDP. Debugging is defined as, “finding and fixing problems in an algorithm or program.”

In addition to the coding concepts, the idea of using algorithms to solve multi-step problems is used in the Engineering Design Process. For example, the steps of the EDP can be thought of as individual algorithms. In this unit students will build structures that solve real-life problems.

Throughout the course of this unit, students will conduct observational investigations. Students will demonstrate and observe ways that objects can move such as in a straight line, zigzag, up and down, back and forth, round and round, and fast and slow using the EDP. Students will need to identify known and unknown information as well as what needs to be known regarding a problem and explain the steps to solve the problem. As a reminder, the EDP is our reinforcement of following steps to solve a problem. (ie: algorithms)

The Science concept of *Science K.6D- observe and describe the ways that objects can move such as in a straight line, zigzag, up and down, back and forth, round and round, and fast and slow* and Math K.8B- *Use data to create real-object and picture graphs* will be the context in which we use the EDP.

#### At home connections:

- Provide opportunities for your child to solve any given problem in a variety of ways.
- Have your child explain something using sequences. For example, making a sandwich: First you take the bread, then put mustard on it, then put deli meats on it, etc.

Concepts within Unit # 3 <a href="#">Link to TEKS</a>	Success Criteria for this concept
Concept #1: Using Algorithms to Solve Multi-Step Problems TA4.A, SK.6D	<ul style="list-style-type: none"> <li>Create algorithms for a variety of platforms (ie: BeeBot, Code.Org, Code-A-Pillar)</li> <li>Debug algorithms so that they can be used properly in problem solving</li> </ul>
Concept #2: Building and Testing Structures TA4.A, SK.6D	<ul style="list-style-type: none"> <li>Use the engineering design process to identify and solve a problem</li> </ul>

### Glossary of Curriculum Components

**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.

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

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

**Success Criteria**—a description of what it looks like to be successful in this concept.

**Competency**—Standards-Based Grading communicates students' understanding of the Texas Essentials Knowledge and Skills (TEKS). Using the TEKS, teachers developed grade-level competencies to communicate student progress in the Standards-Based gradebook. The competencies are the same for each grade-level content area (i.e. 1st grade math) across the district. Teachers report students' progress on the competencies using learning progressions.

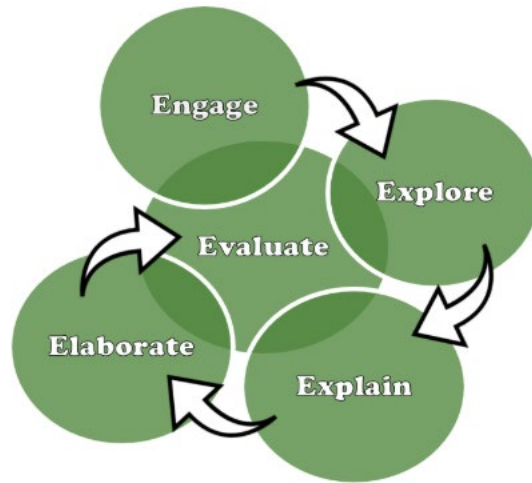
### Parent Resources

The following resources provide parents with ideas to support students' understanding. For sites that are password protected, your child will receive log-in information through their campus.

Resource	How it supports parents and students
<a href="#">Code.org Course A</a>	Code.org is a resource that students use throughout the year. This specific course is geared for Kindergartners. Click on the link to access the lessons.
<a href="#">Scratch Jr</a>	Scratch Jr is a free downloadable app that students use throughout the year. Scratch Jr helps students engage with the foundational of block-based programming in a user-friendly way. The linked resource takes the user to a variety of activities that can be work on using Scratch Jr.
<a href="#">Engineering Design Process</a>	Students will engage in using the Engineering Design Process when solving problems and working through building and testing structures. The link provided shares information on the various stages of the Engineering Design Process.

### Instructional Model

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



STEM Outclass uses the 5E Instructional model.

**Engage:** Teachers start the learning process by involving students in making connections between their past and present learning experience.

**Explore:** The teacher guides students as they perform hand-on investigations where scientific practices and process skills are used to ask questions, observe, predict, illustrate and record.

**Explain:** The teacher guides students as they discuss the discoveries, they made during the Explore activity. Students will also make explicit connections between the Engage and Explore activities as well as the learning intentions of the concept.

**Elaborate:** Students apply what they have learned so far to new experiences in order to develop, extend, connect, and deepen their understanding. Students will also engage in alternative explorations and contrast new facts with prior knowledge.

**Evaluate:** Students reflect on the evidence provided of the new understandings of the concepts.

## Grading Period 3

### Unit 4: Exploring Patterns

Estimated Date Range: January 5 – March 10

Estimated Time Frame: 8 Class Periods

#### Unit Overview:

In this unit, students will continue to develop their skills of using algorithms. However, in addition to solving multi-step problems with algorithms, students will now observe and identify patterns within their algorithms. Patterns in algorithms can either be seen physically based on the movement of the sprite or it can be observed by the types of algorithms that are being used. Students will be able to look for patterns in addition to solving multi-step problems by interacting with a variety of robots (BeeBots) and be introduced to Block-Based Coding (using Scratch Jr.)

Patience, curiosity, and creativity are additional connections that students should be able to make as they engage with their learning. As students continue to engage with using a variety of tools, they will need to be exposed to a variety of ways on how to select, store and share their products on devices. This could be as simple as saving and retrieving information, sharing a reflection out via a Schoology Discussion Board or using Flipgrid to talk about a progress on a project.

As the unit progresses, students will transition their learning from observing patterns in algorithms to observing patterns in nature. Students will be able to engage in the Engineering Design Process to create a variety of builds having to do with year-round seasons. Students will also be identifying patterns in nature such as patterns in seasons, patterns that happen during the night / day. Students will also be able to look for patterns in nature such as in leaves, fruits and shells along with patterns of change in the night sky.

The Science concept of Science K.8A observe and describe weather changes from day to day and over seasons and Math Concept K.8B, use data to create real-object and picture graphs will be the context in which the EPD is used.

#### At home connections:

- Have your child use patterns to solve a problem (I.e. - day/night and seasons).
- Provide opportunities for your child to make predictions about weather.

Concepts within Unit # 4 <a href="#">Link to TEKS</a>	Success Criteria for this concept
Concept #1: Making Predictions Using Patterns  TA2.D, SK.8A	<ul style="list-style-type: none"> <li>• Complete a pattern and find patterns in code</li> <li>• Use a loop in code when completing a puzzle</li> </ul>
Concept #2: Patterns in Our World TA2.D, SK.8A	<ul style="list-style-type: none"> <li>• Create an animation that demonstrates patterns that occur in our natural world.</li> </ul>

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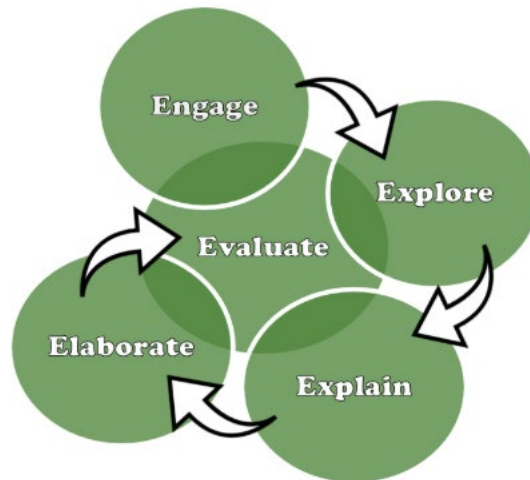
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**Evaluate:** Students reflect on the evidence provided of the new understandings of the concepts.



## Grading Period 4

### Unit 5: Designing and Building Original Products

Estimated Date Range: March 20 – May 25

Estimated Time Frame: 7 Class Periods

#### Unit Overview:

In this unit, Kindergarten students will continue to develop their skills of using algorithms. Up until now, students have learned how basic algorithms work, students have had opportunities to work with physical / handheld coding tools and began to solve problems using algorithms.

The specific programming skills that students will be learning while working with algorithms are solving multi-step problems with algorithms.

Students will be able to solve multi step problems with algorithms by:

- Choosing characters (sprites) and backgrounds for an animated story.
- Have different sprites move at a variety of speeds.
- Deciding when a sprite is needed, and when it can be hidden.
- Interacting with multiple pages / changes of scenery
- Having sprites interact with other sprites.
- Using iterations (simple loops) within their code.

In this unit, students will be investigating the Science concept K.8B, examine evidence that living organisms have basic needs such as food, water, and shelter for animals and air, water, nutrients, sunlight, and space for plants.

In addition, students will apply Math Concept K.8B, use data to create real-object, and picture graphs during the unit. Students will also apply the Engineer Process Design as part of this unit.

#### At home connections:

- Have your child make observations about the basic needs of living organisms.
- Provide opportunities for your child create a picture graph.

Concepts within Unit # 4 <a href="#">Link to TEKS</a>	Success Criteria for this concept
Concept #1: Creating Original Programs TA1.A, SK.9B	<ul style="list-style-type: none"> <li>• Create an original program to solve multi step problems.</li> </ul>
Concept #2: Environmental Solutions TA1.A, SK.9B	<ul style="list-style-type: none"> <li>• Create an animation that demonstrates the basic needs of living organisms.</li> </ul>

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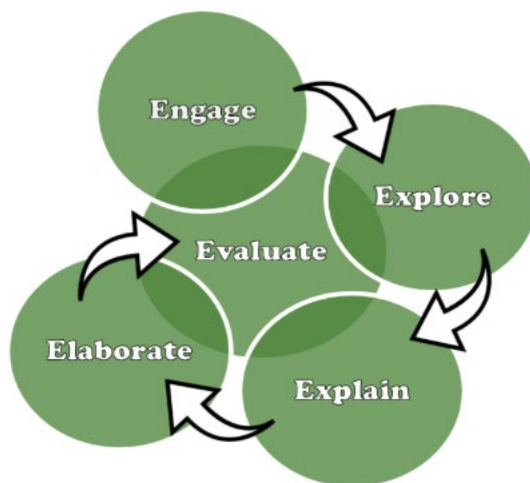
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