FBISD
INSPIRE • EQUIP • IMAGINE
TEACHING & LEARNING

Department of Teaching & Learning

1st Grade 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.

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
TA1.B create original products using a variety of resources
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

Grading Period 1

Unit 1: Introduction to the STEM Lab

Estimated Date Range: August 10 – October 7
Estimated Time Frame: 4 Class Periods

Unit Overview:
In this unit, students will be introduced to STEM Outclass. They will learn and practice classroom routines, procedures, and safety guidelines. In-person, they will review proper use of iPads and how to log-on to the district network. 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. They will practice skills that allow them to own their learning. Digital Citizenship, internet safety, and lab safety are taught in context with each lesson as required.

At home connections:

- Discuss ways your child can practice good digital citizenship when online at home.
- Have your child show you how they log into different tools such as Schoology.
- Have your child demonstrate how they upload items such as pictures or text to a discussion board in Schoology.

Concepts within Unit #1 Link to TEKS	Success Criteria for this concept
Concept #1: Routines, Procedures and Safety S1.1A	• Identify safe and non-safe behaviors in the STEM Lab • Identify the different components of S-T-E-M. • Follow safety rules for STEM Outclass • Be a positive and helpful partner

Unit 2: Fundamentals of Computational Thinking

Estimated Date Range: August 10 – October 7
Estimated Time Frame: 4 Class Periods

Unit Overview:
In this unit students are introduced to iterations in algorithms to solve problems. 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 review computational thinking using iterations in algorithms. They will review 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.

First graders are introduced to iteration or loops. Iteration or loops are a sequence of events that are repeated until conditions are met (or goal is reached). First grade will learn “For loops” only. The three types of loops are;

- For loops – used for a predetermined sequence of events; the initial value is performed once and a count is taken after each iteration (example: move forward 2, repeat 6 times)
- Do loops – used to repeat a sequence until a known condition is met
- While loops – used in situations where we do not know how many times the loop is repeated beforehand.

Students will apply their knowledge of algorithms to computer programming and the engineering design process to solve problems with a culminating project that allows students to solve a problem by engineering a tall tower that will support weight. The math and science concepts of observing and describing the location of an object in relation to another (Science K.6C) and data collection, (Math 1.8A) as well as applying mathematics to problems in to everyday

life is embedded in the project.

At home connections:

- Have your child create a set of directions from getting one place to another. For example: Start in kitchen – take 5 steps forward – turn right – enter living room.
- Review directional words such as up, down, left, right, forward, backward with your child.

Concepts within Unit # 2 **Link to TEKS**	**Success Criteria for this concept**
Concept #1: Using Algorithms to Solve Problems TAK.4A	• Students can create an algorithm that sequences how to plant a seed • Students can create an algorithm that moves a partner to a treasure on a map • Debug an algorithm as needed • Be persistent when creating and working through algorithms • Be a helpful team member • Solve puzzles in a driver and navigator role • 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.
1st grade students will continue to build on computational thinking to solve problems, 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 decomposition (breaking down a problem into smaller, more manageable parts) within creating algorithms and the Engineering Design Process.
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.
1st Graders will continue to work with iterations. As mentioned from the previous unit, iterations are loops which are a sequence of events that are repeated until conditions are met, or the goal is reached. Examples of "for loop" concepts / blocks that will be explored in this unit are:

- *Repeat - an action in which a sprite moves a fixed number of times.*
  - *Ex: A ball moves a certain number of times within the use of a repeat block.*
  - *Ex: A BeeBot turning right 5 times.*
- *Forever - an action in which a sprite's action continues forever*
  - *Ex: A ball rolling back and forth within an animation.*
  - *Ex: A Lego WeDo fan rotating forever until stopped by student.*

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 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 using the EDP.
Throughout the course of this unit, students will conduct observational investigations. Students will demonstrate and record the ways that objects can move such as in a straight line, zig zag, 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. (i.e.: algorithms)
The science concept of Science 1.6C- *demonstrate and record the ways that objects can move such as in a straight line, zig zag, up and down, back and forth, round and round, and fast and slow* and Math 1.8A- *collect, sort and organize data in up to three categories using models/representations such as tally marks or T-Charts* 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.
- Work with your child on debugging problems that might occur in a variety of scenarios.

Concepts within Unit # 3 Link to TEKS	Success Criteria for this concept
Concept #1: Building and Testing Structures TA4.A, SK.6D	• Students will use the engineering design process to solve a problem.

Concept #2: Using Algorithms to Solve Multi Step Problems TA4.A, S1.6C	• Students will create algorithms to provide a variety of solutions to a problem.

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.

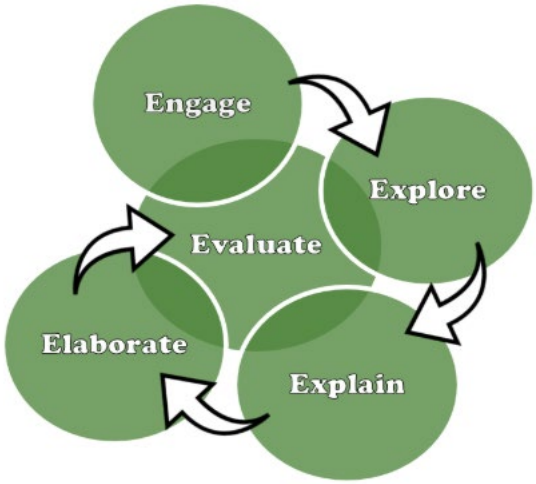
Parent Resources

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
Code.org Course B	Code.org is a resource that students use throughout the year. This specific course is geared for 1st Graders. Click on the link to access the lessons.
Scratch Jr	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.
Engineering Design Process	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 either 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 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:

- Provide opportunities for your child to solve any given problem in a variety of ways.
- Work with your child on debugging problems that might occur in a variety of scenarios.

Concepts within Unit # Link to TEKS	Success Criteria for this concept
Concept #1: Making Predictions with Patterns TA2.D, S1.8C	• Students will create a Scratch Jr. animation that illustrates and describes each season of the year.

Concept #2: Patterns in our World TA2.D, S1.8C	• Students will create a Scratch Jr. animation that Illustrates that the seasons are a repeating pattern.

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.

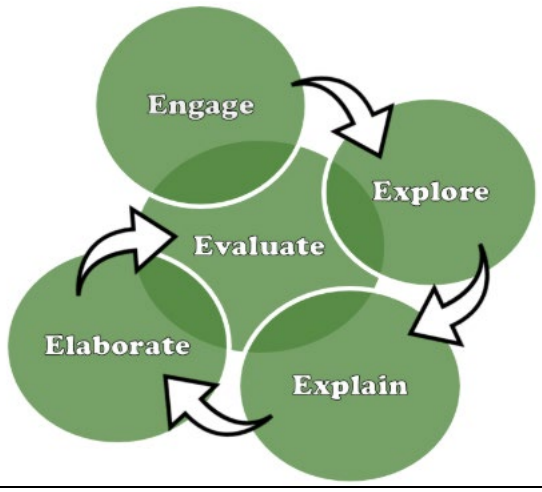
Parent Resources

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
Code.org Course B	Code.org is a resource that students use throughout the year. This specific course is geared for 1st Graders. Click on the link to access the lessons.
Scratch Jr	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.
Engineering Design Process	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 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, 1st Grade students will continue to develop their skills of using algorithms. Up until now, students have learned how basic algorithms work, have had opportunities to work with physical / handheld coding tools, and began to solve problems using algorithms. As the year progressed, students were introduced to decomposing problems into smaller, more manageable parts.

In this unit, students will continue to decompose problems, that is starting with the big picture, and breaking it down into smaller tasks to achieve the overall goal. However, in doing so, students will be introduced to collecting, analyzing and representing data effectively.

Examples of collecting, analyzing and representing data effectively include:

- Adjusting speeds in a variety of sprites (Scratch Jr)
- Adjusting a fan's rotation based on the needs of a classroom (Lego WeDo)
- Utilizing iterations (loops) based on the needs of a coding map (code.org / scratch jr)
- Debugging and making adjustments to algorithms

As the unit progresses, students will have the opportunity investigate the following science concepts under Science 1.9B - analyze and record examples of interdependence found in various situations such as terrariums and aquariums or pet and caregiver.

- Analyze and record how organisms depend on other living things in various situations to survive.

Students will utilize the Engineering Design Process during this unit to solve environmental issues that occur in the natural world.

At home connections:

- Provide opportunities for your child to solve any given problem in a variety of ways.
- Have your child make observations about interactions that occurs in an ecosystem.

Concepts within Unit # Link to TEKS	Success Criteria for this concept
Concept #1: Environmental Solutions TA1.A, S1.9B	• Students will provide example of how organisms depend on other living things to survive.
Concept #2: Creating Original Programs TA 1.A, S1.9B	• Students will create a Scratch Jr. animation that Illustrates interactions in an ecosystem.

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.

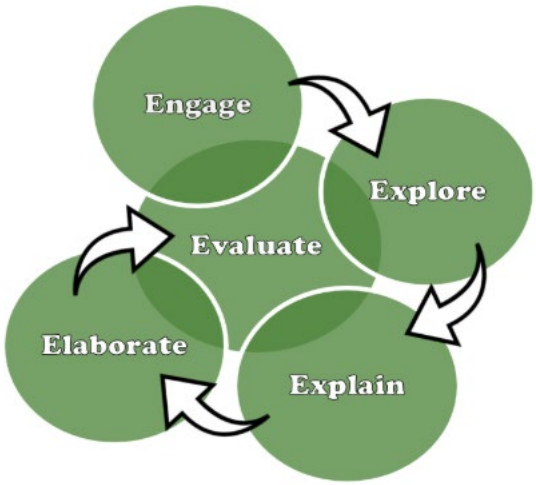
Parent Resources

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 parent and students
Code.org Course B	Code.org is a resource that students use throughout the year. This specific course is geared for 1st Graders. Click on the link to access the lessons.
Scratch Jr	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.
Engineering Design Process	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.