Verizon Innovation Lab
Overview
2024 - 2025

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.

Priority and Important Standards

The standards describe ways in which students are expected to engage in the content. The 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.

Technology Applications TEKS Strands

There are 5 strands in which Technology Applications TEKS can be categorized in. Depending on the concept, students will engage with TEKS within the following strands:

- Computational Thinking
- Creativity and Innovation
- Data Literacy, Management and Representation
- Digital Citizenship
- Practical Technology Concepts

Grading Period 1

Unit 1: The Entrepreneurial Mindset

Estimated Date Range: 8/8 – 10/9
Estimated Time Frame: 42 days

Unit Overview: In this unit, students will be introduced to the Engineer Design Process (EDP) and its importance in solving a variety of problems. Because the EDP is a tool that will be utilized throughout both semesters of the course,

students will have several opportunities to engage with it throughout this unit. Students will also explore historical entrepreneurs as well as explore career opportunities in entrepreneurship.

At home connections:

- Identify a variety of problems that need to be solved. Together come up with solutions that would solve the problem.
- Build prototypes of a variety of products that help solve a problem.

Concepts within Unit #1 Link to TEKS	**Success Criteria for this concept**
Concept 1: The Engineer Design Process • Lesson 1: Historical Engineers • Lesson 2: The Engineer Design Process • Lesson 3: Sustainability and the Engineer Design Process • Lesson 4: Careers in Entrepreneurship	• Students will research famous Entrepreneurs and identify their contributions to society. • Students will use the Engineer Design Process to identify and solve a problem by creating a product and present to an audience. • Students will use the Pillars of Sustainability to create an upcycled prototype. • Students will explore career paths as an Entrepreneur.
Concept 2: Computer Aided Design • Lesson 1: Introduction to TinkerCad • Lesson 2: Design your own Logo • Lesson 3: Design your own Solution • Lesson 4: Careers in Entrepreneurs CAD	• I will become proficient in using CAD Software • I can create a 3 dimensional product that helps solve a problem. • I can present a product to an audience both in an online and in-person learning environment.

Grading Period 2

Unit 2: Digital Media

Estimated Date Range: 10/16 – 12/20
Estimated Time Frame: 41 days

Unit Overview: In this unit, students will learn a variety of graphic design principles and how the impacts of applying these principles effects an audience. As the unit progresses, students will take their knowledge of graphic design and apply it to video editing. Students will be able to understand how graphics, text, video and audio can sway an audience into becoming interested / not interested in a product or service. Students will end the unit learning about the different career opportunities in digital media.

Concepts within Unit # 2 Link to TEKS	Success Criteria for this concept
Concept 1: Principles of Multimedia in Graphic Design • Lesson 1: Typography • Lesson 2: Color • Lesson 3: Layout and Composition • Lesson 4: Images • Lesson 5: Fundamentals of Design	• I can identify, explain and apply graphic design principles. • I can create an original product using graphic design principles. • I can explore a variety of careers in graphic design
Concept 2: Principles of Multimedia with Video • Lesson 1: Beginner Filming • Lesson 2: Video Editing Basics • Lesson 3: Multimedia Project • Lesson 4: Green Screen • Lesson 5: Podcasting and Screen Recording • Lesson 6: Careers in Digital Media	• Apply elements of multimedia such as text, images, audio and video to create video based content. • Create storyboards that allow students to structure their production before creating them digitally. • Apply advanced edits to video productions. • Create a podcast using audio editing tools

Grading Period 3

Unit 3: Simulated Experiences with Application Development, AI and Machine Learning

Estimated Date Range: 1/9 – 3/7
Estimated Time Frame: 38 days

Unit Overview: The Introduction to Artificial Intelligence (AI) unit is designed to introduce VILS Lab students to the fascinating world of AI and its practical applications. Students will explore the concepts of AI, its impact on various fields, and gain hands-on experience in coding AI models using Code.org, a comprehensive online learning platform.

Through a combination of interactive lessons, guided activities, and coding projects, students will develop a solid foundation in AI and computational thinking	
Concepts within Unit # 2 **Link to TEKS**	**Success Criteria for this concept**
Concept 1 – Application Development • Lesson 1: Introduction to App Lab- Hour of Code (10 Days) • Lesson 2: Design Mode and Events with App Lab (12 days)	• Students will explore the core concepts of AI, its applications in different fields using simulated software. • Students will develop the ability to code basic AI models using Code.org, showcasing their computational thinking and programming proficiency.
Concept 2: AI and Machine Learning • Lesson 1: AI and Machine Learning with Data	• Students will develop a variety of AI and Machine Learning programs using simulation software.

Grading Period 4

Unit 4: Robotics and Circuitry

Estimated Date Range: 3/17 – 5/29
Estimated Time Frame: 50 Days

Unit Overview: In this unit, students will learn about the fundamentals of programming a robot using block-based coding. Students will learn a variety of skills and concepts and be able to apply these so that their robot can solve a variety of problems. Students will be exposed to a variety of robots during this unit. After students are proficient in programming robots, they will then explore concepts in electrical engineering and apply learning in a simulated environment as well as a breadboard.

Concepts within Unit # 2 **Link to TEKS**	**Success Criteria for this concept**
Concept 1 – Algorithms within Robotics • Lesson 1: Algorithmic Thinking • Lesson 2: Logic and Conditional Statements • Lesson 3: Iterations (Loops) • Lesson 4: Variables • Lesson 5: Careers in Robotics	• I will create and debug algorithms. • I will program a robot in a simulated environment. • I will create and test block based algorithms on a variety of robots. • I will use the Engineering Design Process to construct a build. • I will use text-based coding to create algorithms for a programmable robot.
Concept 2: Problem Solving Electrical Engineering • Lesson 1: Algorithms and Electrical Engineering • Lesson 2: Innovative Problem Solving • Lesson 3: Project Based Learning with Hummingbird	• Students will use simulation software and a breadboard kit to apply concepts of electrical engineering • Students will solve a variety of problems using block based coding and Hummingbird Circuit Kits.

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
Discovery Education	This online resource provides access to a wide variety of videos to help in learning more about engineering concepts. .
Britannica School	This is an information resource for students. It has encyclopedia articles, multimedia, primary sources, games, and other learning resources that support student learning.
Ebsco Host	This online reference system serves all content areas.
Maps 101	This online resource provides access to access to maps, animations, videos, games, & activities that may be used when looking at engineering careers and where they are most prevalent.
World Book	World Book contains thousands of informational articles with stunning illustrations, videos, interactive maps, and activities.
Scratch	This is a website created by MIT that is used to teach block coding concepts.

Instructional Model:

The Instructional Model for Verizon Innovation Lab is the 5E Model. The 5E model lesson cycle consists of engage, explore, explain, elaborate and evaluate. In Robotics and Engineering I, students utilize multiple class periods to navigate through this cycle.

Engineering Design Process:

In addition, VILS Innovation Lab uses the Engineering Design Process. Students will engage with this model as it helps engage throughout the problem-solving practice. The steps that are used in the Engineering Design Process are: Ask, Imagine, Plan, Create, Test, Improve and Share.