



STEM Innovations 5

Curriculum

June 2026

<p style="text-align: center;">Unit A: Google for Education: Applied Digital Skills</p> <p style="text-align: center;">Enduring Question: How do the basic programs of Google Workspace make school and personal life more efficient?</p>	
<p>Timeframe: About 12 classes - 40 minutes each</p>	
<p>Mandatory Resources:</p> <ul style="list-style-type: none"> • Desktop Computer and Promethean Board • Chromebooks • Google for Education: Applied Digital Skills Lessons and Handouts 	
<p><i>Academic Vocabulary:</i></p> <p><u>Gmail (Email) Terms</u></p> <ul style="list-style-type: none"> • Inbox: The main folder where you receive and view incoming emails. • Compose: The button or action used to create a brand-new email message. • Draft: A message you have started writing but have not yet sent; it is saved automatically so you can finish it later. • Reply All: A response sent to every person who received the original email, including the sender and all CC'ed recipients. • Spam: Unwanted or junk email, often sent in bulk, which is automatically filtered into a separate folder for security. <p><u>Google Docs (Document) Terms</u></p> <ul style="list-style-type: none"> • Document: A digital file used for typing and formatting text (like a report or essay). • Orientation: The direction in which a page is displayed or printed (Portrait is vertical; Landscape is horizontal). • Margins: The white space around the edges of a page that separates the text from the edge of the paper. • Headers: A section at the very top of every page used for titles, page numbers, or dates. • Footers: A section at the very bottom of every page, often used for page numbers or citations. • Text Block: A specific area or paragraph of text within a document. • Alignment: How text is positioned between the margins (Left, Center, Right, or Justified). • Bullets: A list format used to organize information with small symbols (dots, squares) instead of numbers. • Font: The specific design or style of the text characters (e.g., Arial, Times New Roman). • Font Style: Modifications made to text to add emphasis, such as Bold, <i>Italics</i>, or <u>Underline</u>. • Image: A picture, drawing, or photograph inserted into a document. • Link (External and Internal): A clickable piece of text; External links go to a website, while Internal links jump to a different section within the same document. <p><u>Review & Management Terms</u></p> <ul style="list-style-type: none"> • Spell Check: A tool that identifies and helps correct misspelled words. • Word Count: A tool that calculates the total number of words, characters, and pages in a document. • Suggesting Mode: A collaborative feature where edits appear as "suggestions" that the owner can either accept or reject, rather than changing the text permanently. • Version History: A log that allows you to see all past changes made to a file and restore it to an earlier state if needed. • File Type: The format of a digital file, indicated by its extension (e.g., .docx for Word, .pdf for Acrobat, .gdoc for Google Docs). 	

Google Slides (Digital Presentation) Terms

- **Digital presentation:** A flexible, easy-to-update, and customizable presentation that can be opened on any device.
- **Background:** The color visible behind the images and text on a digital presentation.
- **Animations:** A way to make images and text on a digital presentation move, to add visual interest.
- **Emoji:** An image used to represent a person, idea, or emotion.
- **Speaker Notes:** Notes on a digital presentation that show what the speaker should say.

Google Drive (Cloud Storage & Organization) Terms

- **Cloud storage:** A safe place on the internet where you can save important information. Once something is saved in the Cloud, you can easily access it from any computer, smartphone, or tablet with internet access.
- **Folders:** A place to store files to help you stay organized.
- **Color-coding:** Assigning a color to help you easily recognize folders whenever you open Google Drive.
- **Uploading:** Saving a file or folder from your computer to Drive.
- **Sharing settings:** Sharing settings allow you to control what people can do with your folders or a file once they have access.
- **Subfolders:** A folder within a folder where you can store and organize related files.

Big Idea	Content	Objectives	Activities/Strategies	Assessment	Standards
How does using Google Workspace make school and personal life easier?	Students will use the lessons on the Google for Education: Applied Digital Skills website as an introduction to using the features of Google Drive, Google Docs, Google Slides, and Gmail.	Students will be able to: <ul style="list-style-type: none"> • Understand the Gmail inbox. • Compose an email. • Reply to an email. • Practice using tools, settings, and other features in Google Docs. • Edit and adjust the content and settings of a document to prepare it for sharing and collaboration. • Understand that each person in a class has a unique personal identity and brings interests and qualities that should be shared and built upon. • Reflect on their own learning preferences and styles. • Identify how digital skills can help them explore their personal identity and express themselves to others. • Use digital skills to visually represent themselves to the class. • Make and present a slide to introduce themselves to the class. • Add images and text to their slide. 	Use the Google for Education: Applied Digital Skills website with video tutorials and individual student Chromebooks	Observation and questioning. Completion of individual lessons/assessments.	ISTE Standards <ul style="list-style-type: none"> • 1.1 • 1.2 • 1.3 • 1.4 • 1.5 • 1.6 STEELS Standards <ul style="list-style-type: none"> • TE.6–8.T.A • ETS.6–8.E • ETS.6–8.CS

		<ul style="list-style-type: none">• Create and color-code folders in Google Drive to save class materials and assignments.• Create a file naming convention to easily find assignments and keep track of due dates.• Move related files into the appropriate class folder or sub-folder.• Share files and folders with a classmate and add them to their own Drive.			
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UNIT B: Project STEM: CSE 1: CS FUNDAMENTALS IN SCRATCH**Enduring Question: Why does Computer Science Matter?**

Timeframe: About 12 classes - 40 minutes each

Mandatory Resources:

- Chromebooks
- Promethean Board

*Academic Vocabulary:***Computer Science Terms**

- Algorithm (n): a set of steps that explain how to complete a task.
- Code (n): language that a computer can understand.
- Computer science (n): the study of computers and algorithms, and their impact on society.
- Growth mindset (n): the belief that one can get better at something through hard work and practice.
- Sprite (n): a character or object we control with code
- Blocks (n): single instructions for a sprite that can be dragged and snapped together.
- Block Palette (n): area to the left which stores all the blocks.
- Scripts (n): groups of blocks that are attached to each other in the Code Area and run in a specific order.
- Code Area (n): the place where we put our code blocks in Scratch to build scripts that control the program.
- Backdrop (n): the image is shown on the Stage behind the sprites in Scratch.
- Stage (n): the area in Scratch that displays a finished program when it is being run.
- Green flag (n): when clicked in Scratch, starts all scripts in a program.
- Event (n): an action that causes something to happen.
- Sequence (n): a series of instructions that follow one another in order.
- Parallelism (n): sets of instructions that run at the same time.
- Initializing (v): assigning an initial (starting) value to a variable or object.

Big Idea	Content	Objectives	Activities/Strategies	Assessment	Standards
How do I use computer programming to make things move and happen in Scratch?	Students will begin their investigation of computer science by discussing both what they think it is and why it matters. They will then participate in a coding challenge to further their new understanding of computer science.	<ul style="list-style-type: none"> • Identify what computer science is. • Define what an algorithm is. • Understand that code is needed to make a computer do something. • Write a program for a robot to follow. • Follow and execute program instructions. • Use a growth mindset to overcome challenging problems. 	Use Scratch to create projects that will help the students better understand the main concepts of computer programming using a more visual approach.	<p>Observation and questioning.</p> <p>Completion of individual lessons/assessments.</p>	<p>ISTE Standards:</p> <ul style="list-style-type: none"> • 1.1 • 1.2 • 1.3 • 1.4 • 1.5 • 1.6 <p>STEELS Standards:</p> <ul style="list-style-type: none"> • TE.6–8.T.A • ETS.6–8.E • ETS.6–8.CS

		<ul style="list-style-type: none"> • Understand the difference between fixed and growth mindset. • Understand the purpose of pair programming. • Use pair programming to complete a task. • Use basic Scratch functionality. • Create their first program. • Demonstrate how events are used to trigger actions to happen in Scratch. • Explain the relationship between events and responses. • Build chains of events and responses in both sequential flow and parallel flow. • Demonstrate how sequences are processed from top to bottom in a specific order. • Build an animation in Scratch using the letters of their name. • Identify animation as a series of still images shown in rapid succession. • Demonstrate how sequences are processed from top to bottom in a specific order. • Build an animation in Scratch using the letters of their name. • Identify animation as a series of still images shown in rapid succession. 			<ul style="list-style-type: none"> • 3.5.6-8.N (ETS) • 3.5.6-8.W (ETS)
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Unit C: Microbits**Enduring Question: How does hardware and software work together to solve problems and create solutions?****Timeframe:** About 12 classes - 40 minutes each**Mandatory Resources:**

- Desktop Computer and Promethean Board
- Chromebooks
- Hummingbird Robotics Kits
- Birdbrain Technologies Website
- Microsoft MakeCode Website
- Snap! Programming Website
- Various Building Materials and Supplies
- Handouts

Academic Vocabulary:**Computer Science Terms**

- Programming/Coding: The process of writing instructions (code) that the micro:bit and Hummingbird can execute.
- Algorithm: A step-by-step set of rules or instructions designed to perform a specific task (e.g., the code sequence to make an arm wave).
- Block-Based Coding: A visual method of programming where instructions are represented by graphical blocks that snap together, replacing text-based syntax.
- Micro:bit: The small, programmable computer board that acts as the "brain" for the Hummingbird Bit system.
- Input: Data or signals received by the micro:bit from the environment, usually through sensors (e.g., light level, sound level).
- Output: The information or action produced by the micro:bit/Hummingbird, usually through actuators (e.g., an LED lighting up, a motor spinning).
- Conditional Statement (If/Then/Else): A fundamental control flow structure where a specific block of code is executed only if a given condition is true.
- Loop (Iteration): A sequence of instructions that is continually repeated, either a specific number of times (for loop) or indefinitely (forever loop).
- Variable: A storage location defined by a name that holds a specific piece of data that can be changed by the program (e.g., storing the current light level).
- Debugging: The process of identifying and correcting errors (or "bugs") in computer code or the physical wiring of the robot.
- Automation: Using a program to make a system (the robot) operate and perform tasks with minimal or no human intervention.
- Physical Computing: Building interactive physical systems by using software and hardware that can sense and respond to the real world.
- Robot: A machine capable of carrying out a complex series of actions automatically, especially one programmable by a computer.
- Sensor: A device that detects and measures a physical property (like light, distance, or sound) and converts it into an electrical signal (input).
- Light Sensor: Measures the intensity of ambient light.
- Distance Sensor: Measures the distance to an object.
- Sound Sensor: Measures the volume or presence of sound.
- Dial/Rotary Sensor: Measures the rotational position of a knob.
- Actuator: A component of a machine that controls a mechanism or system (e.g., motors and LEDs are actuators for the Hummingbird).
- Motor: An electrical device that converts electrical energy into mechanical energy (motion).
- Position Servo (Standard Servo): A motor that can be programmed to move to and hold a specific angle.
- LED (Light Emitting Diode): A semiconductor light source that emits light when current flows through it.
- Tri-color LED: An LED capable of displaying different colors by mixing the intensities of Red, Green, and Blue light.
- Engineering Design Process (EDP): A non-linear, cyclical series of steps that engineers follow to find the best solution to a problem (Define, Design, Build, Test, Improve).
- Circuit: A complete and closed path through which electric current can flow.
- Terminal/Connector: The points on the Hummingbird board where components (sensors, motors, LEDs) are connected.

Big Idea	Content	Objectives	Activities/Strategies	Assessment	Standards
How does hardware and software work together to solve problems and create solutions?	<ul style="list-style-type: none"> Students will complete the tutorials and activities on the MakeCode by Micro:bit website to introduce how software and hardware work together when programmed. 	Students will be able to: <ul style="list-style-type: none"> understand and apply the fundamental principles & concepts of computer science. gain practical experience of writing computer programs to solve problems. evaluate and apply information technology, including new or unfamiliar technologies analytically to solve problems be responsible, competent, confident and creative users of information and communication technology 	<ul style="list-style-type: none"> Use the Microsoft MakeCode website and its resources to complete tutorials and lessons. 	<ul style="list-style-type: none"> Observation and questioning Completion of individual lessons and projects 	ISTE Standards <ul style="list-style-type: none"> 1.1 1.4 1.5 1.6 1.7 STEELS Standards <ul style="list-style-type: none"> ETS.6-8.E ETS.6-8.CS TE.6-8.K

UNIT D - UKits Beginner AI**Enduring Question: How can the combination of robotics, programming, and artificial intelligence be utilized to design innovative solutions for complex, real-world challenges?****Timeframe:** About 36 classes - 40 minutes each**Mandatory Resources:**

- Desktop Computer and Promethean Board
- Chromebooks
- iPads
- UKIT AI Beginner Kits
- UKIT Education app
- uCode Website
- Handouts
- Potential Robot Models: Boom Barrier, Grabber, Golf Club, Elephant Trunk, Snail, Snake, Dinosaur, Octopus, Humanoid, Carrier Robot, Scorpion, Fan, Traffic Cop

*Academic Vocabulary:***Core AI Concepts**

- **Artificial Intelligence (n):** Technology that can analyze and perceive data in order to make autonomous predictions or decisions.
- **AI Algorithm (n):** A set of instructions that allows the computer to perceive data and reason on its own.
- **Algorithm (n):** A sequence of steps.
- **Autonomous (adj):** Able to do things on its own.
- **Machine Learning (n):** An AI algorithm that learns without human intervention from patterns in datasets.
- **General AI (n):** A theorized type of artificial intelligence which can perform a wide range of tasks, with human-like decision making and/or personality.
- **Narrow AI (n):** Artificial intelligence which performs a specific task or function.

Data and Perception

- **Data (n):** Information.
- **Dataset (n):** A collection of data.
- **Perception (n):** The ability to interpret and make sense of sensory data.
- **Prediction (n):** An algorithm's "best guess" based on the information it has been given.
- **Sensing (n):** The process of collecting sensory data.
- **Sensor (n):** A device that allows a machine to collect sensory data from the natural world.
- **Sensory Data (n):** Information that is collected with senses or sensors.

Programming and Interface

- **Sprite (n):** A character or object we control with code.
- **Blocks (n):** Single instructions for a sprite which can be dragged and snapped together.
- **Scripts (n):** Groups of blocks that are attached to each other in the Code Area and run in a specific order.
- **Event (n):** An action that causes something to happen.
- **Initializing (n):** Assigning an initial (beginning) value to a variable or object.
- **User Interface (n):** The part of an app that users see and interact with.

Robotics and Ethics

- **Robot (n):** A machine designed to do specific tasks in physical space.
- **Humanoid (adj):** Looking or acting like a human.
- **Ethics (n):** The study of values, moral principles, and systems that guide human behavior.
- **Ethical (adj):** The morally right thing to do.

Big Idea	Content	Objectives	Activities/Strategies	Assessment	Standards
How can the combination of robotics, programming, and artificial intelligence be utilized to design innovative solutions for complex, real-world challenges?	<ul style="list-style-type: none"> • Students will work in pairs to complete the building instructions for each robot model. • Students will work in pairs to program each completed robot model to perform various tasks and challenges using elements of artificial intelligence. 	<ul style="list-style-type: none"> • Explore and observe the natural world by analyzing biological systems. • Practice using robotic tools and programming multiple servo motors to work together. • Build and design a robot that mimics an observed animal movement. • Learn fundamental AI concepts and how they apply to the real world. • Expand basic programming and computational thinking skills to perform multiple operations at one time. Explore basic robotics, coding, engineering, and AI concepts and how they are being used in the real world. • Use modern tech tools (uKit EDU app, UKIT robots, online AI tools, computers). • Participate in the engineering design process by iterating on robotic designs. • Learn AI fundamentals and introductory concepts by exploring AI applications and resources. 	<ul style="list-style-type: none"> • Use the UKIT AI Intermediate kits, UKIT Education app, and uCode coding platform to complete the building and programming of multiple robots. 	<ul style="list-style-type: none"> • Observation and questioning • Completion of individual robots/lessons/assessments 	ISTE Standards <ul style="list-style-type: none"> • 1.1 • 1.2 • 1.3 • 1.4 • 1.5 • 1.6 • 1.7 STEELS Standards <ul style="list-style-type: none"> • TE.6–8.T.A • ETS.6–8.E • ETS.6–8.CS