Black River Innovation Campus

STEAM and Interactive Technology Workshops

2026-2027 Field Trip Offerings

From Digital Users to Digital Builders

Welcome! Our field trip workshops and series give Pre-K through 12th-grade students hands-on experience with real-world engineering, coding, and technology. Through story-driven, project-based challenges, we make abstract concepts tangible—building core academic skills without requiring prior coding experience. We want to empower students to create rather than passively consume technology.

Why Bring Your Students?

- Computational & Critical Thinking: Students decompose complex problems into clear, step-by-step algorithms.
- Spatial & Cause-and-Effect Logic: Building physical devices and visual code links actions directly to outcomes.
- Resilience Through Debugging: Mistakes become valuable data points as students test, isolate errors, and optimize designs.
- Collaboration & Communication: Team challenges build technical vocabulary and active problem-solving skills.

Standard Frameworks & Schedule Overview

Our lessons map directly to CSTA (Computer Science) and NGSS (Science & Engineering) standards, providing explicit learning targets.

Primary Focus by Grade Span

Lower Elementary (Pre-K - Grade 2): Screen free physical coding, sequencing, conditional logic

Upper Elementary (Grades 3-5): Interactive game logic, forces of motion, physical computing

Middle School (Grades 6-8): Microcontrollers, machine learning models, 3D CAD design

High School (Grades 9-12): IoT smart courses, digital physics simulations, VR navigation, 3D fabrication

* We adapt session lengths, combine modules, or tailor content to fit your school's bell schedule, group size, and curriculum goals.

Pricing

Standard Field Trips (1.0 – 1.5 hrs): $10 – $15 / student (varies by group size & series commitment)
High School Intensive (3.0 hrs): $30 – $40 / student
VR Escape Room Add-On: $15 / student

Pre K - Grade 2 Field Trips

1 Hour Sessions

Give your students an engaging, hands-on introduction to computer science! Designed specifically for early learners, our field trip workshops transform core STEM concepts into interactive, story-driven adventures. Through playful coding, students learn to decompose problems, build spatial and cause-and-effect reasoning, embrace a growth mindset through "debugging," and sharpen collaborative communication skills.

Coding Express: Little Engineers

Discover foundational computer science concepts through tactile, hands-on exploration—without screen time. Using the LEGO Education Coding Express system, students utilize physical “Action Bricks” to program a smart train's behavior, transforming active play into rigorous, developmentally appropriate problem-solving. As students design track layouts and navigate real-world scenario challenges—from managing city traffic to freight logistics—they gain early mastery over core computational structures: sequencing, conditional logic (if/then), and looping.

1A-AP-10 (Looping & Logic): Develop programs with sequences and simple loops, to express ideas or address a problem.

Storytelling Through Code

In this hands-on computer science workshop, young creators transform from passive technology consumers into active digital producers. Using ScratchJr, students learn to snap together graphical programming blocks to animate characters, construct multi-scene narratives, and design interactive stories—building foundational literacy and computational thinking skills through creative expression. As students program characters to move, jump, dance, and speak, they master core algorithmic thinking, event-handling, and spatial reasoning in a collaborative, playful environment.

1A-AP-10 (Control Structures & Logic): Develop programs with sequences and simple loops, to express ideas or address a problem.

Grade 3-5 Field Trips

1.5 Hour Sessions

Equip your upper elementary students with the high-level computational thinking, physics modeling, and algorithmic logic necessary for 21st-century success. Our upper elementary workshops bridge conceptual science and technology with creative application, driving deep engagement through problem-solving, iterative testing, and peer collaboration.

Build an Interactive Arcade Game

Step behind the scenes of digital game design! In this high-energy workshop, students transition from game players to game creators using MIT's Scratch Programming. Young developers use event blocks, conditional logic (if/then), and basic coordinate positioning (X/Y movement) to build a fully functional, interactive arcade game. Students will code character controls, implement collision detection (touching targets), and track a dynamic score—applying the same core logic principles used by professional software engineers.

1B-AP-10 (Control Structures & Logic): Create programs that include sequences, events, loops, and conditionals.
1B-AP-11 (Variables & Data Storage): Create variables to store and modify data for dynamic scoring or timers.

Junior Engineers: Forces of Motion

Uncover the physical science behind sports and mechanics! Using the LEGO® Education BricQ Motion Essential system, students explore forces, motion, and energy transfer through hands-on, screen-free engineering. Through sports-themed design challenges, young engineers construct, test, and refine physical models to investigate pushing, pulling, friction, and momentum. Students isolate mechanical variables, gather observational data, and optimize their builds to solve real-world physical challenges.

3-5-ETS1-3 (Engineering Design): Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.

Robot Academy

Step into the intersection of hardware design and software engineering! Using the LEGO® Education SPIKE™ Essential system, students integrate smart motors, color/light sensors, and block-based programming to construct autonomous robotic solutions. Through story-led engineering challenges, young innovators collaborate to design, build, and code smart inventions that respond to environmental inputs—translating real-world problems into functional hardware-software systems.

1B-CS-02 (Hardware, Software, & Hardware-Software Systems): Model how information flows within a system between hardware and software components.

1B-AP-10 (Control Structures & Logic): Create programs that include sequences, events, loops, and conditionals.

Grades 6-8 Field Trips

2-3 Hours

Prepare middle school students for secondary computer science and CTE pathways with rigorous, project-based engineering experiences. Our middle school workshops move students beyond introductory block code into advanced algorithmic thinking, machine learning paradigms, hardware-software integration, and 3D spatial design.

MicroPet Challenge: Physical Computing and Smart Systems

Step into the role of hardware engineers and interaction designers! In this high-engagement physical computing workshop, students harness the BBC micro:bit microcontroller to design, program, and assemble an interactive "MicroPet." By writing event-driven code that processes real-time input from light, motion, and touch sensors, students can program their MicroPets to to react to the real world.

2-CS-02 (Hardware & Software Integration): Design and iteratively develop computational artifacts that collect and exchange data using sensors and actuators.

The AI Lab- Machine Learning and Intelligent Systems

Demystify artificial intelligence by building and training custom machine learning models! In this hands-on lab, students step into the role of AI engineers, exploring computer vision and speech recognition. Using custom dataset generation (capturing facial gestures, voice inputs, and movements), students train machine learning classifiers and integrate them into block-based programming projects. Students gain a first-hand understanding that AI models depend entirely on data quality and classification logic.

2-DA-09 (Data Analysis & Computational Perception): Collect data using computational tools and transform the data to make it more useful and meaningful.

From Clay to CAD: Spatial Reasoning & 3D Fabrication

Bridge the gap between physical modeling and digital fabrication. Students explore Constructive Solid Geometry by first sculpting desktop prototypes out of physical clay, deconstructing complex real-world objects into fundamental geometric shapes (cubes, cylinders, spheres). Translating their physical models into Tinkercad’s 3D workspace, students manipulate X/Y/Z spatial coordinates, execute grouping and hole operations, and prepare original 3D CAD files for additive manufacturing (3D printing).

MS-ETS1-4 (Engineering Design): Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

High School Field Trips

2-3 Hours

Prepare your high schoolers for college and STEM careers! These intensive 3-hour workshops immerse students in real-world engineering environments. Students work in teams to build digitally smart obstacle courses, program physical math models, and solve high-stakes design challenges—turning abstract concepts into hands-on innovation.

The Smart Course Challenge: Wearable Tech & Smart Environments

How do self-driving cars "see" a stop sign, and how do smartwatches know when you've taken a step? Students step into the roles of Hardware Engineers and Beta Testers to program micro:bit sensors and build a "Living Course"—a physical environment that reacts to human motion in real-time. By coding wearable devices that track speed, movement, and distance, students explore the "Internet of Things" (the smart tech inside everyday objects) firsthand. Teams race against the clock to calibrate sensors, fix code errors, and navigate a course that responds to the code they write!

3A-CS-02 (Hardware & Software Systems): Understand how software code controls physical hardware components.

HS-ETS1-2 (Engineering Problem Solving): Break down a complex real-world challenge into smaller engineering steps.

Digital Physics: Simulation Lab

How does a video game know how high a character should jump, or how an architect tests if a bridge will stand before it's built? Welcome to The Simulation Lab! In this workshop, students become Systems Architects, learning how the invisible laws of nature—gravity, speed, sound, and light—are translated into digital computer code. By turning real math formulas into interactive code, students build digital models to see if their designs hold up under pressure. If you can code the math, you can simulate the world!

3A-DA-12 (Data & Computer Modeling): Create digital models that use data to simulate real-world systems and predict results.

3A-AP-13 (Algorithmic Logic): Apply mathematical logic to create computer programs that solve complex problems.

Engineering Teamwork: VR, 3D Fabrication & Collaboration

Engineers rarely solve complex challenges alone. In this hands-on workshop, student teams tackle high-pressure scenarios that demand clear communication, precise spatial navigation, and a shared vision. First, teams navigate a mission-critical problem inside a Virtual Reality (VR) simulator using technical communication. Next, they design and fabricate 3D-printed items together. The focus isn't on perfection or winning—it's about learning to collaborate, communicate clearly, and think like real-world engineers.

3A-AP-17 (Modularity & Collaborative Design): Deconstruct complex team tasks into smaller, shared design components.

HS-ETS1-3 (Engineering Team Evaluation): Work in teams to design, evaluate, and refine physical solutions based on real-world constraints.