

**CodeJoy Computational Thinking In Action with
Micro:bit**

2021-2022 STEM Scale-Up Program

Grade Levels: 3-12, available in or out of school

Website: www.codejoyeducation.com

Award Provides:

- Two 3-hour online workshops, flexible scheduling
- Class set of 30 micro:bits, plus USB cords, AAA battery pack, AAA batteries
- 1 Hummingbird breakout board controller, 2 motors, additional AA battery pack
- Project write ups for physical computing and creative robotics
- Access to online asynchronous teacher materials
- Ongoing tech support
- 1 hour of virtual co-teaching/field trips for students during the school year

Additional Cost(s) to Awardee In 2021-2022:

- Batteries – 4 AA needed for motor power
- No travel or accommodations needed

Approximate Sustainability Cost After Award Period:

- Batteries – 2 AAA needed for micro:bit, 4 AA batteries needed for motor power
- Curriculum and online asynchronous teacher materials are free

Program Summary:

Computer science is quickly becoming a basic skill in today's world. But not every student is excited about "computer science." How about playing Rock-Paper-Scissors? Or building a Tiny Drummer from popsicle sticks and cups? Physical computing, an extension of CS, involves using devices to bring computer science off the screen and into the real world. Mounting evidence suggests that physical computing represents a strong and effective way to engage more diverse students in CS, including girls, students of color, students of lower socio-economic status, rural students, and students with learning exceptionalities. Seeing their projects come to life helps students understand the power of computer science and how things work in the real world. (EdWeek.org)

In order to teach CS and physical computing, especially at scale across the state, Iowa educators need thoughtful, inexpensive, and well-supported tools. The micro:bit, with funding from the BBC, is a small, durable microcontroller costing under \$15 per student, developed for classroom use, with inputs (sensors) and outputs (actions) built into the board. It can be programmed using coding languages specifically designed for use by elementary, middle, and high school students, and can scale in complexity over many grades and projects.

Teachers will receive a classroom set of 30 micro:bits to use for immediate implementation in either in-person or online instruction. Teachers will also receive a breakout board, called a Hummingbird, and 2 motors, to use their micro:bit to control motors and LEDs. (Many teachers across the state already have classroom sets of Hummingbirds.) PD sessions will be conducted online, allowing for accessibility and connection for teachers across Iowa. In two three-hour virtual sessions, educators will learn multiple projects to serve beginners and intermediate students across 3rd-12th grades.

In addition, as an online learning company, CodeJoy is also able to offer a unique opportunity: In virtual field trips directly serving students, teachers can observe micro:bit being taught virtually by CodeJoy's experienced teachers. In this innovative extension of PD, targeted peer observation is a form of collaborative professional development to share instructional techniques and pedagogy. Flexible scheduling throughout the school year is available.

What is Required to Implement the Program:

Educator(s) must participate in two online workshops, each lasting three hours. Scheduling of these is flexible. Teachers should join online workshops from a computer or Chromebook. Educator(s) must participating in the STEM Council Scale-Up Educator Survey.

Professional Development:

Duration: Two three-hour online workshops scheduled July-October, plus one hour of virtual co-teaching/field trip available for students during school year.

Date(s): TBD, Summer 2021 and School Year 2021-2022

Location: Online

STEM Scale-Up Program Application Link: www.iowaSTEM.org/Scale-Up-Application