i-STEAM with CSATS

PennState College of Education

CSATS Bridging Research & Education in STEM Center for Science and the Schools

Engage with the Building Blocks of Code

A Hands-on Approach to Coding

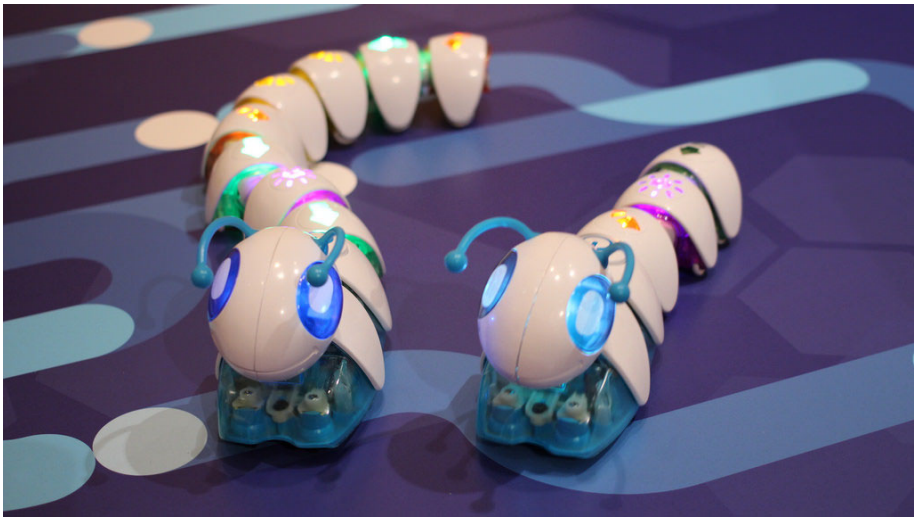

Photo by Maurizio Pesce on flickr

Presented by
Taylor Wood, CSATS
and
Gabe Knowles, CSATS

April 6, 2019 (9:00 am – 3:30 pm)

Penn State University
Location: Chambers Building

Target Audience: K - 3 Teachers

Learn through the senses of your students by engaging in the fundamental building blocks of code. In this workshop teachers will work together to learn how to use Fisher-Price©'s Code-a-pillar™ to engage students in hands-on coding activities that develop essential critical thinking and academic skills, such as planning a sequence of events, decomposing a problem into a series of steps, and collaborating with others. We will also cover ways to integrate our coding experience with other content areas, such as literacy, math, and science. Throughout this workshop learners will practice the skills of predicting, observing, and collaborating, which scientists and engineers do in their practice on a daily basis to solve problems and make discoveries.

This workshop is FREE to all educators with ACT 48.

All i-STEAM Workshops are aligned to PA State Standards, Next Generation Science Standards and Common Core. A continental breakfast and lunch are provided by the Center for Science and the Schools (CSATS). Maximum enrollment is 24; please register online now to reserve a spot.

Sponsored by
The Penn State College of Education
Center for Science and the Schools
182 Chambers Building, University Park, PA 16802

To register visit: http://csats.psu.edu
For more information: e-mail Gabe Knowles at glk54@psu.edu or call 814-865-1713

K12 Computer Science Framework Core Practices

Practice 1. Fostering an Inclusive Computing Culture

At all grade levels, students should recognize that the choices people make when they create artifacts are based on personal interests, experiences, and needs.

Practice 2. Collaborating Around Computing

At any grade level, students should work collaboratively with others. Early on, they should learn strategies for working with team members who possess varying individual strengths.

Practice 3. Recognizing and Defining Computational Problems

At any grade level, students should be able to break problems down into their component parts. In the early grade levels, students should focus on breaking down simple problems.

Practice 4. Developing and Using Abstractions

Students at all grade levels should be able to recognize patterns. Young learners should be able to identify and describe repeated sequences in data or code through analogy to visual patterns or physical sequences of objects.

Practice 5. Creating Computational Artifacts

At any grade level, students should participate in project planning and the creation of brainstorming documents. The youngest students may do so with the help of teachers.

Practice 6. Testing and Refining Computational Artifacts

At any grade level, students should be able to compare results to intended outcomes. Young students should verify whether given criteria and constraints have been met.

Practice 7. Communicating About Computing

At any grade level, students should be able to refer to data when communicating an idea. Early on, students should, with guidance, present basic data through the use of visual representations, such as storyboards, flowcharts, and graphs.

Pennsylvania K-12 Computer Science Standards

Standards for Grades K - 2

1A-AP-08
Model daily processes by creating and following algorithms (sets of step-by-step instructions) to complete tasks.

1A-AP-09
Model the way programs store and manipulate data by using numbers or other symbols to represent information.

1A-AP-11
Decompose (break down) the steps needed to solve a problem into a precise sequence of instructions.

1A-AP-12
Develop plans that describe a program's sequence of events, goals, and expected outcomes.

1A-AP-14
Debug (identify and fix) errors in an algorithm or program that includes sequences and simple loops.

Standards for Grades 3 - 5

1B-AP-11
Decompose (break down) problems into smaller, manageable subproblems to facilitate the development process.

1B-AP-15
Test and debug (identify and fix errors) a program or algorithm to ensure it runs as intended.

1B-AP-16
Take on varying roles, with teacher guidance, when collaborating with peers during the design, implementation, and review stages of program development.