Building Capacity for Preservice Computer Science Education

Professional Learning Catalog – Spring 2025

Through May 2025, Indiana University will continue to offer pre-service educator workshops across the state on topics related to computer science standards and classroom integration.

Through the generosity of our financial and organizational partners, the Indiana Department of Education and Nextech, we are able to offer workshops **at your site** for your educators at no cost, including a stipend for the workshop organizer and incentives for attendees.

There are two options by which we can potentially engage with your program and your pre-service teachers. Topics are numerous and flexible, depending on your preferences and needs.

Read below to learn more!

OPTION 1: WORKSHOPS

The CS Education team from IUB will deliver an immersive professional learning workshop for your pre-service teachers in a 3- or 6-hour block on a school-day or weekend day, on your campus.

Available Workshop Topics:

Click title to read full description below.

- Introduction to CS for K-8 Educators
- CSforSocialGood
- Primary AI (Artificial Intelligence in 3rd-5th Life Science)
- ReCT (Integration CT into K-2 Literacy)
- AI Goes Rural (CS/AI Intro for Middle Grade Learners)
- Data Literacy for Teachers and Students

What's included in Workshops:

- Incentive for attendees ($100 per 3-hours – workshop must occur outside of class time)
- Stipend for organizing preservice teacher educator
- Access to resources and accompanying curriculum

Format:

- Workshop length can be full-day, half-day, or half day AM & half day PM.
- You collaborate with IU CS Education team to finalize workshop content and logistics.

How to Schedule:

Email Dr. Susan Drumm, sdrumm@iu.edu, to begin planning your event(s).

OPTION 2: IN-CLASS

The CS Education team from IU will visit your pre-service class (in-person or virtually) for a "taste" of computer science based on topics relevant to your course from the list below.

What's included in In-Class Option:

- Mutually-agreed upon time – in-person or virtual – for one or multiple sessions
- Stipend for organizing pre-service teacher educator
- Access to resources and accompanying curriculum

Available In-class Topics:

Click title to read full description below.

- Introduction to CS for K-8 Educators
- CSforSocialGood
- Primary AI (Artificial Intelligence in 3rd-5th Life Science)
- ReCT (Integration CT into K-2 Literacy)
- AI Goes Rural (CS/AI Intro for Middle Grade Learners)
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Learn More About Us:

Building Capacity for Indiana Preservice Computer Science Education

Building Capacity for Indiana Preservice Computer Science Education (BCPCS) is a grant-funded project designed to enhance and strengthen the impact of Indiana computer science learning opportunities for Indiana PK-12 students. BCPCS provides opportunities for pre-service and in-service teachers to increase their computer science pedagogical knowledge and increase their understanding of and ability to implement authentic problem-solving using computing. Though state-wide CS Summits and a CS Cohort, BCPCS also provides learning and support opportunities to educators within Indiana Educator Preparation Programs, as they seek to meaningfully integrate computer science pedagogy into their preservice teacher programs. For more information, visit https://cs4in.iu.edu/index.html

Indiana University Bloomington – School of Education

The mission of the IUB School of Education is to improve teaching, learning, and human development in a global, diverse, rapidly changing, and increasingly technological society. For more information, visit: https://education.indiana.edu/about/index.html

Questions? Ready to plan a workshop? Reach out to Susan Drumm at **sdrumm@iu.edu**.

Length:
Curriculum originally designed in four 1-hour blocks. Can be presented in part or whole, as in-class lessons or as a standalone workshop.

Modality:
Virtual or in-person

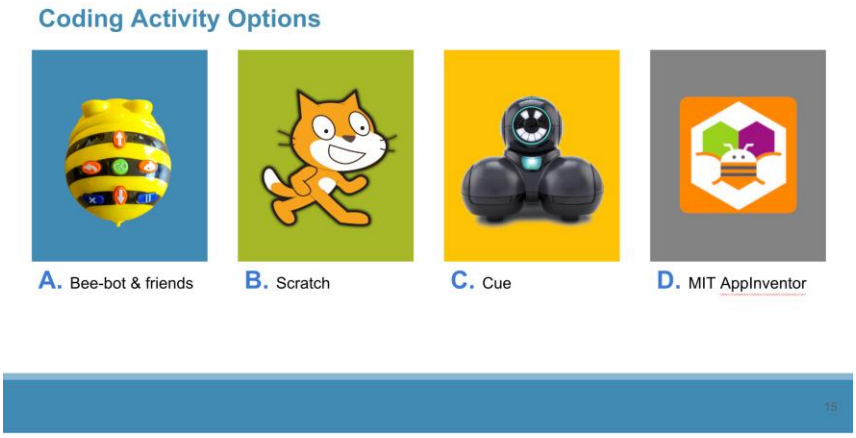
Course and Standard-Alignment:
EDUC-W200: Teaching with Technology

Incentive:
As a stand-alone workshop, $100 for Indiana pre-service teachers in the form of a Rewards Genius gift card & $500 stipend for organizing instructor. As an in-class visit, a $250 stipend for organizing instructor.

Introduction to CS K-8 Educators

With Indiana's adoption of a computer science strand within the Indiana Academic Standards for Science, it is vital that those entering the teaching profession have a basic knowledge and understanding of computer science topics. This computer science unit, consisting of 4 1-hour lessons, has been designed specifically for IU Bloomington's required preservice education course EDUC-W200 *Teaching with Technology.*

Topics addressed in the unit include computer science history and stereotypes; computational thinking concepts; computer science integration across the disciplines, particularly for creativity and problem-solving; machine learning and artificial intelligence; and the impacts of computer science on society. Participants will be encouraged to reflect and evaluate through relevant scenarios and discussion, and will practice in activities to deepen their skills and understanding.



Length:
Flexible

Modality:
Virtual or in-person

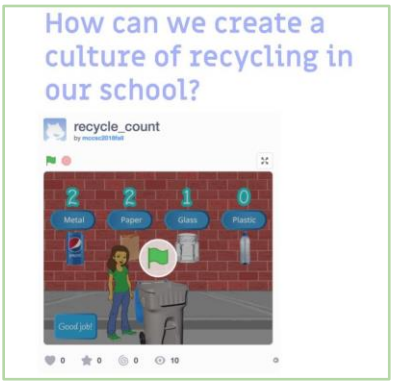
Course and Standard-Alignment:
Indiana CS Standards

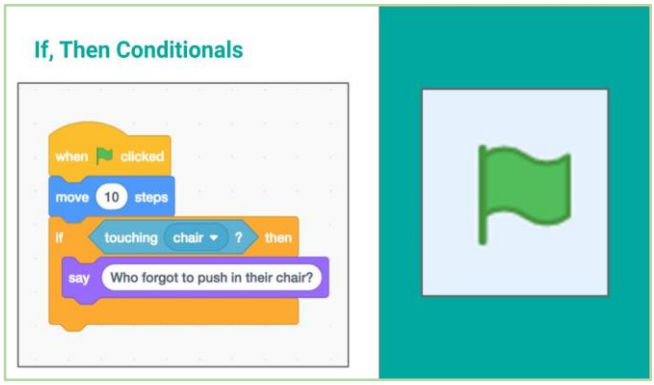
Incentive:
As a stand-alone workshop, $100 for Indiana pre-service teachers in the form of a Rewards Genius gift card & $500 incentive for organizing instructor. As an in-class visit, a $250 stipend for organizing instructor.

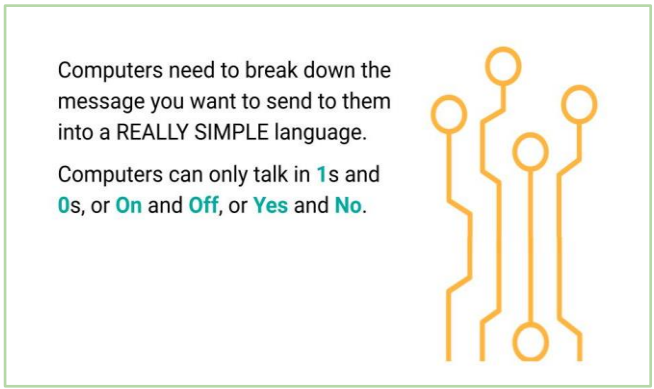
CSforSocialGood

Block coding is a way of learning programming in K-12. It can be done through plugged activities using Scratch or unplugged activities. One way to implement Computer Science and teach students coding by through having them design solutions to real-world problems. The CSforSocialGood curriculum consists of two units. The first unit is Introduction to Block Coding, and it includes 9 lessons. The second unit (8 lessons) focuses on Problem-Based Learning (PBL) and integrates block coding to solve real-world problems.

The workshop includes unplugged and plugged activities using manipulatives such as sorting cards and Scratch. These activities demonstrate the programming concepts and how they can be taught in the 6th-grade curriculum through problem-solving activities.







Length:
Flexible

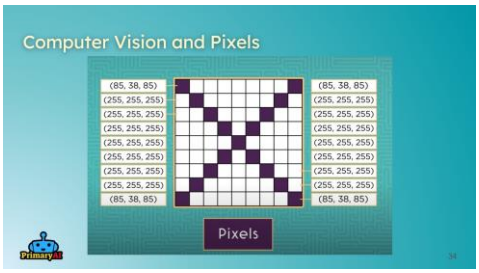
Modality:
Virtual or in-person

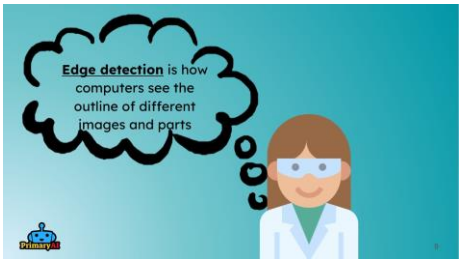
Incentive:
As a stand-alone workshop, $100 for Indiana pre-service teachers in the form of a Rewards Genius gift card & $500 incentive for organizing instructor. As an in-class visit, a $250 stipend for organizing instructor.

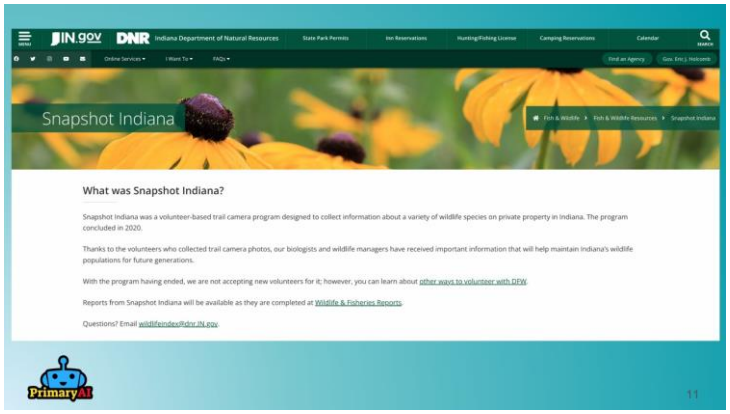
Primary AI (3-5 Artificial Intelligence in Life Science)

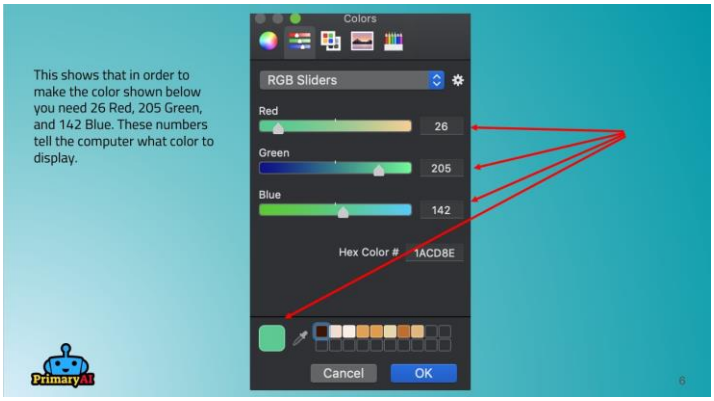
Artificial intelligence has become a fundamental technology with a transformative impact on our society. It is crucial to foster favorable attitudes and outlooks toward AI among elementary school students, making the design of educational experiences for this age group exceptionally significant. PrimaryAI represents a comprehensive AI and science curriculum integrated with an immersive learning environment. It introduces upper elementary science students to various AI concepts such as perception, planning, robotics, and machine learning, while also addressing ethical considerations related to AI.

The workshop consists of an introduction to Artificial Intelligence, an exploration of the Primary AI curriculum, its objectives, and alignment with standards, as well as example activities that can be implemented with students in elementary classrooms.









Length:
Flexible

Modality:
Virtual or in-person

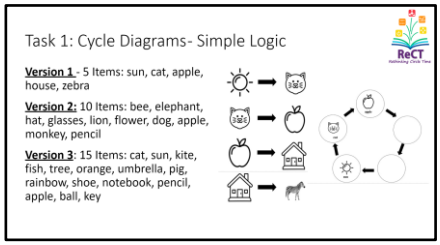
Course and Standard-Alignment:
ELA – Common Core Standards
CS – CSTA standards

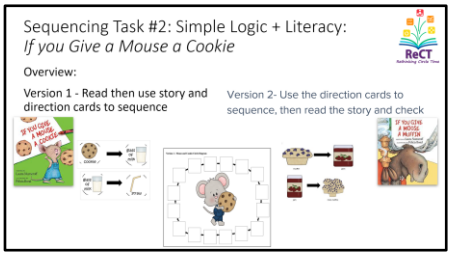
Incentive:
As a stand-alone workshop, $100 for Indiana pre-service teachers in the form of a Rewards Genius gift card & $500 incentive for organizing instructor. As an in-class visit, a $250 stipend for organizing instructor.

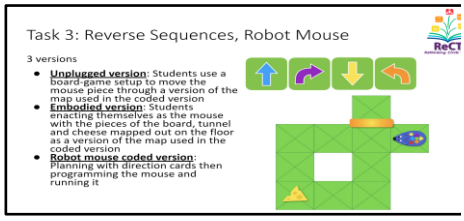
ReCT (Introducing CT into K-2 Literacy)

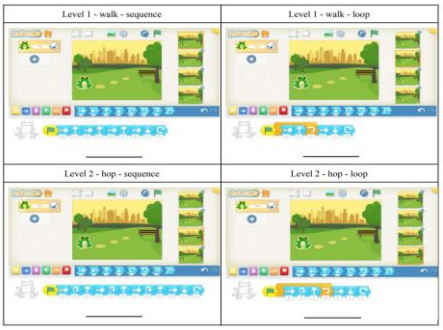
Computational Thinking (CT) is a set of characteristics needed to have a systematic way of approaching a problem so a computer can solve it. Basic elements of CT include pattern recognition, abstraction, decomposition, and algorithm design. This workshop targets the preservice teachers focusing on K-2 learners and introduces how K-2 educators can integrate computer science into literacy classes.

The workshop includes unplugged, embodied, and Scratch Jr. activities using manipulatives such as picture cards, direction cards, and circle diagrams to demonstrate how to integrate literacy to support K-2 learners' development in CT concepts.









Length:
Full or Half Day Workshop

Modality:
Virtual or in-person

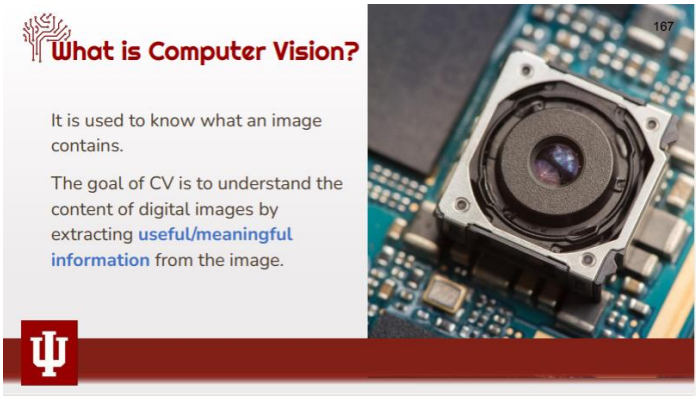
Course and Standard-Alignment:
AI4K12 Guidelines

Incentive:
As a stand-alone workshop, $100 for Indiana pre-service teachers in the form of a Rewards Genius gift card & $500 incentive for organizing instructor. As an in-class visit, a $250 stipend for organizing instructor.

AI Goes Rural

AI Goes Rural develops AI introductory lessons for 6-8 learners. The purpose is to emphasize the importance of visualization and representation with computers, how computers perceive and learn from data, provide opportunities for learners to apply AI concepts to real-world applications, and consider the ethical implications of AI.

The workshop provides various hands-on options to learn how AI (ML, NLP, Computer vision) can help our society and solve daily problems. The options include step-by-step instructions that support both preservice teachers and 6-8 learners.



Length:
Curriculum originally designed in four 1-hour blocks. Can be presented in part or whole, as in-class lessons or as a standalone workshop.

Modality:
Virtual or in-person

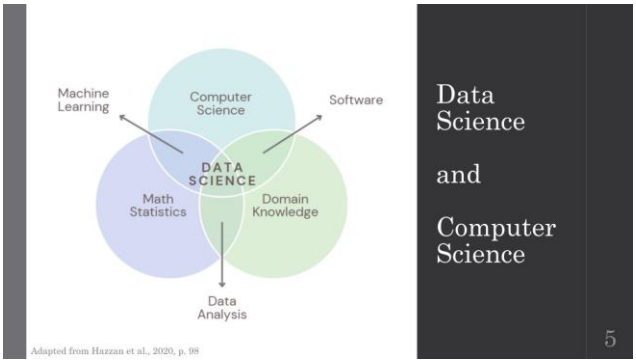
Alignment:
CS Educator Standards

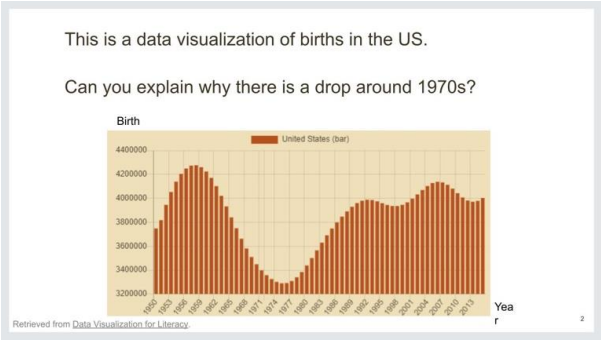
Incentive:
As a stand-alone workshop, $100 for Indiana pre-service teachers in the form of a Rewards Genius gift card & $500 incentive for organizing instructor. As an in-class visit, a $250 stipend for organizing instructor.

Data Literacy for Teachers and Students

A current focus of CS education is the integration of Data Science (DS) and Data Literacy concepts into K-12 curricula. DS is an emerging field of interdisciplinary integration in three areas: Mathematics/Statistics, CS, and domain knowledge. In our daily lives, technologies are constantly collecting and using data (e.g., website browsing history, shopping history). In addition, artificial intelligence (AI) is an increasingly critical element of our daily lives, and AI relies on data to generate decisions and predictions. Therefore, understanding where and how we use data to inform these models is a critical topic for future generations, in order to ensure that AI is manipulated ethically and understood correctly. By introducing DS to K-12 learners, they will be prepared to understand and use data wisely in this data-driven world.

This is a three-unit lesson design targeting preservice teacher education. Each unit has two 75-minute courses with basic concepts of DS, AI, and data literacy through hands-on activities.






BCPCS
Building Capacity for Inclusive Prevention
Computer Science Education