

[Computer Science and Cybersecurity Credentials:](#)

1. Computational thinking, problem solving, and algorithms;
2. Digital citizenship and cybersecurity;
3. Technology systems hardware and software;
4. Information literacy and data use; and
5. Impacts of computing.

[ND Computer Science and Cyber Security Standards](#)

Level 2 Credential (40 hours)

- **CYBER.ORG Cyber Teacher Middle School** (5 Days, 40 hours, Level 2 Credential)
- **CYBER.ORG Cyber Teacher High School** (5 Days, 40 hours, Level 2 Credential)
- **Code.org Computer Science Discoveries** (5 Initial Days plus 4 Additional days, 72 hours, Level 2 Credential)
- **Code.org Computer Science Principles** (5 Initial Days plus 4 Additional days, 72 hours, Level 2 Credential)

Level 3 Credential (15 hours)

- **CYBER.ORG STEAM Fundamentals Elementary** (2 Days, 16 hours, Level 3 Credential)
- **Code.org Computer Science Fundamentals** (1 Day, 8 hours, Towards Level 3 Credential)

Cafeteria Options

- **Minecraft** (1 Day, 8 hours, Cafeteria option)
- **CYBER.ORG Cyber Society** (8 hours over a month period, Cafeteria option)

CYBER.ORG Cyber Teacher Middle School (5 Days, 40 hours, Level 2 Credential)

Description: Teachers will explore the STEM EDA Curriculum for students in grades 6 through 8. STEM EDA (Explore, Discover, Apply) explores science, technology, engineering, and mathematics through hands on projects that builds experiences. Participants will also explore how the micro:bit can be incorporated into middle school curriculum.

Daily agenda:

Day 1: Teachers will explore the STEM EDA unit on Coding with Scratch. In this unit, students learn to create games in Scratch, an object-oriented, graphics-based programming language, while simultaneously learning about the fundamentals of many other programming languages. Teachers will then be introduced to the micro:bit and make:code programming software.

Standards Covered: 6-8.HS.1-3, 6-8.T.1, 6.PSA.1-3, 7-8.PSA.1-2, 6-8.DD.1

Day 2: Teachers will explore the STEM EDA unit on Music. In this unit, students learn about cryptography as a means for secret communication. Students learn how to create and decipher codes using the entry level decoding devices that are found in this unit. Teachers will continue to use the micro:bit to learn how to program music activities.

Standards Covered: 6-8.HS.1-5, 6-8.T.1, 6.PSA.1-3, 7-8.PSA.1-2, 6-8.DD.1

Day 3: Teachers will explore the STEM EDA unit on Aerospace. In this unit, students learn about gliders during WWII, components of gliders, and fundamental principles of flight. Students develop the skills to design and build their own glider. Teachers will continue to use the micro:bit to learn how to program games. Explore Everfi Ignite Digital Citizenship course.

Standards Covered: 6-8.HS.1-3, 6-8.T.1, 6.PSA.1-3, 7-8.PSA.1-2, 6-8.DCA.1, 6-8.DD.1, 6-8.RU.1-4, 6-8,DI.1

Day 4: Teachers will explore the Cyber Society and Cybersecurity courses as they apply to middle school grades. Cyber Society has a Media Literacy unit specifically for grades 6-8 and other topics under Ethics and Communities are also applicable for this age range. Cybersecurity also has units that could be introduced at this age level, including networking. Teachers will continue to use the micro:bit to learn how to program it to add sensors and wireless connections.

Standards Covered: 6-8.NI.1, 6-8.HS.1-5, 6-8.T.1, 6.PSA.1-3, 7-8.PSA.1-2, 6-8.DD.1, 6-8.A.1, 6-8.E.1, 6-8.C.1, 6-8.IP.1-3, 6-8.IC.1, 6-8.SI.1-2, 6-8.SE.1-4, 6-8.RU.1-4, 6-8,DI.1

Day 5: Follow-up Assignment. Teachers work with their students in the CYBER.ORG curriculum, prepare a lesson plan, and reflect on how the lesson went with their students. This is turned in with pictures from the lesson.

Follow up: If there are questions about what the teacher taught their students from the reflection, the instructor will follow up with those specific teachers with those questions and ways to improve their usage of the CYBER.ORG curriculum.

Missing Standards: none

Credentials: 1. Computational thinking, problem solving, and algorithms; 2. Digital citizenship and cybersecurity; 3. Technology systems hardware and software; 4. Information literacy and data use; and 5. Impacts of computing.

CYBER.ORG Cyber Teacher High School (5 Days, 40 hours, Level 2 Credential)

Description: Teachers will explore CYBER.ORG's Cyber Literacy course using the Parallax cyber:bot and the BBC micro:bit platforms to create complex builds that incorporate Python coding, a combination of tactile and infrared sensors, and dive deeper into the humanities that are at play in the world of privacy vs. security and artificial intelligence.

Teachers will explore how Cyber and Cybersecurity is integrated throughout our lives and ways to protect ourselves and our students. There will be time to explore resources to bring into the classroom. Teachers will also be exploring the BBC micro:bit platform for a more in depth understanding.

Daily agenda:

Day 1: Teachers will learn how to assemble a cyber:bot and how to set up the hardware and software to work on the cyber:bot. Teachers will begin programming basic functions to make the micro:bit light up, create sounds, and setting up simple electrical builds on the cyber:bot. Teachers will continue to learn how to program the cyber:bot and by the end of the day should be able to complete a simple navigation challenge.

Standards Covered: 9-12.HS.1, 9-12.T.1, 9-12.PSA.1, 9-12.DCA.1

Day 2: Teachers will explore the Cybersecurity course within the CYBER.ORG library. Teachers will explore security tools, understand how various cyberattacks operate, and learn to detect and mitigate attacks. Teachers will also explore the micro:bit while not connected to the cyber:bot for activities to bring to their classrooms.

Standards Covered: 9-12.NI.1-2, 9-12.HS.1-3, 9-12.T.1, 9-12.PSA.1, 9-12.SE.1-4, 9-12.RU.1-4, 9-12.DI.1

Day 3: Teachers will explore the Cyber Society course within the CYBER.ORG library. Cyber Society has a Media Literacy unit and other topics under Ethics and Communities that explore skills students need to be cyber safe and smart. Teacher will continue to program the cyber:bot using the Cyber Literacy course. The goal for this session is to program and set up the bot for the Whisker Navigation challenge.

Standards Covered: 9-12.HS.1, 9-12.T.1, 9-12.PSA.1, 9-12.DCA.1, 9-12.A.1, 9-12.E.1, 9-12.IP.1-3, 9-12.IC.1, 9-12.SI.1, 9-12.SE.1-4, 9-12.RU.1-4, 9-12.DI.1

Day 4: Teachers will continue to program the cyber:bot. The goal for this session is to program and set up the bot for Infrared Navigation and explore how to utilize switches on the cyber:bot. This will take teachers through the robotic builds and programming of Cyber Literacy I and starts to explore concepts in Cyber Literacy II. Teachers will also explore how sensors can be connected to a micro:bit.

Standards Covered: 9-12.HS.1, 9-12.T.1, 9-12.PSA.1, 9-12.DCA.1

Day 5: Follow-up Assignment. Teachers work with their students in the CYBER.ORG curriculum, prepare a lesson plan, and reflect on how the lesson went with their students. This is turned in with pictures from the lesson.

Standards Covered: 9-12.C.1

Follow up: If there are questions about what the teacher taught their students from the reflection, the instructor will follow up with those specific teachers with those questions and ways to improve their usage of the CYBER.ORG curriculum.

Missing Standards: None

Credentials: 1. Computational thinking, problem solving, and algorithms; 2. Digital citizenship and cybersecurity; 3. Technology systems hardware and software; 4. Information literacy and data use; and 5. Impacts of computing.

CYBER.ORG STEAM Fundamentals Elementary (2 Days, 16 hours, Level 3 Credential)

Description: STEAM Fundamentals is a phenomenon-based, hands-on science curriculum with technology ideas built into it. The modules are designed for student to learn the engineering design process to understand concepts and solutions. This course provides teachers with hands-on experience in how the course works and provides them with methods of teaching computer science and cybersecurity concepts in the elementary grade levels.

Day 1: Teachers will explore the grade 2 unit of What is Matter?. During this part of the day, they will explore content of the unit and work with each other on the Random Objects observation on page 14. Teachers will also explore the Cyber Pop outs for grade 2. Teachers will then explore the grade 3 unit of Robobees. During this part of the day, they will explore the content of the unit and work with each other on Traits assignment on page 17-21. Teachers will also explore the Cyber Pop outs for grade 3. Discussion on how Common Sense Media can be used in the classroom.

Day 2: Teachers will explore the grade 4 unit of Communications with a focus on the micro:bit. During this part of the day, they will explore content of the unit and work with the micro:bit on activities throughout the unit. Teachers will also explore the Cyber Pop outs for grade 4. Teachers will then explore the grade 5 unit of Titanic. During this part of the day, they will explore the content of the unit with a focus on how ships are designed and the flaws in the Titanic's design. Teachers will also explore the Cyber Pop outs for grade 5.

Follow up:

Standards Covered: 2-5.NI.1, 2-5.HS.1-3, 2-5.T.1, 2-5.PSA.1-3, 2-5.DCA.1, 2-5.DD.1, 2-5.A.1, 2-5.E.1, 2-5.C.1, 2-5.IP.1-3, 2-5.IC.1, 2-5.SI.1-2, 2-5.SE.1-4, 2-5.RU.1-4, 2-5.DI.1

Missing Standards: None

Credentials: 1. Computational thinking, problem solving, and algorithms; 2. Digital citizenship and cybersecurity; 3. Technology systems hardware and software; 4. Information literacy and data use; and 5. Impacts of computing.

Code.org Computer Science Fundamentals (1 Day, 8 hours, Towards Level 3 Credential)

Description: Code.org's Computer Science Fundamentals courses blend online and "unplugged" non-computer activities to teach students computational thinking, problem solving, programming concepts and digital citizenship. The course takes a wide lens on computer science by covering topics such as programming, pedagogy, overviews of the online curriculum and teacher dashboard, as well as strategies for teaching "unplugged" classroom activities.

Daily agenda: https://curriculum.code.org/media/uploads/image_eKIVMAz.png

Daily agenda: Overview of the workshop, the course and computer science, experience an unplugged-plugged lesson progression, understand how to navigate the code.org website and set up classes, introduce dry runs and materials for planning lessons, participants practice their dry run lessons, reflect on planning and dry run lessons, discuss what it will look like for the students, discuss what it means to teach CS Fundamentals in an accessible manner, make a plan to bring CS Fundamentals to the classroom, wrap up and end the day.

Day 1: Participants will explore the curriculum and learning tools and discuss classroom management and teaching strategies. They will develop their skills while working in small groups to deepen their understanding of the materials. Participation in the training will help build a community of teachers for support.

Follow up:

Standards Covered: K-5.NI.1, K-5.HS.1-3, K-5.T.1, K-5.PSA.1-4, K-5.DCA.1, K-5.DD.1-2, K-5.A.1, K-5.E.1, K-5.C.1, K-5.IP.1-3, K-5.IC.1, K-5.SI.1-2, K-5.SE.1-4, K-5.RU.1-4, K-5.DI.1

Credentials: 1. Computational thinking, problem solving, and algorithms; 2. Digital citizenship and cybersecurity; 3. Technology systems hardware and software; 4. Information literacy and data use; and 5. Impacts of computing.

Code.org Computer Science Discoveries (5 Initial Days plus 4 Additional days, 72 hours, Level 2 Credential)

For teachers of grades 6-10

Description: Computer Science Discoveries is an introductory computer science course that empowers students to create authentic artifacts and engage with computer science as a medium for creativity, communication, problem solving, and fun.

The course takes a wide lens on computer science by covering topics such as programming, physical computing, HTML/CSS, and data.

Daily agenda:

5 Initial Days: <https://curriculum.code.org/media/uploads/Screen-Shot-2019-04-21-at-9.10.23-PM.png>

Agenda focuses on the first semester of content for the course to prepare teachers to start teaching CS Discoveries. The units included in these days are Unit 1: Problem Solving and Unit 2: Web Development.

Unit 1 is a highly interactive and collaborative introduction to the field of computer science, as framed within the broader pursuit of solving problems. A problem-solving process will be used to address a series of puzzles, challenges and real-world scenarios. Participants will also learn how computers input, output, store, and process information to help humans solve problems. The unit concludes with a project in designing an application that helps solve a problem.

Unit 2 will show students how to create and share content on their own web pages. After deciding what content they want to share with the world, they'll learn how to structure and style their pages using HTML and CSS. They'll also practice valuable programming skills such as debugging and commenting. By the end of the unit, they'll have a personal website that can be published to the Internet.

1st Additional Day – Agenda focuses on Unit 3: Animations and Games

In Unit 3, students build on their coding experience as you program animations, interactive art, and games in Game Lab. The unit starts off with simple shapes and builds up to more sophisticated sprite-based games, using the same programming concepts and the design process computer scientists use daily. In the final project, students develop a personalized, interactive program.

2nd Additional Day – Agenda focuses on Unit 4: The Design Process

Unit 4 introduces the broader social impacts of computing. Through a series of design challenges, students will learn how to better understand the needs of others while developing a solution to a problem. The second half of the unit consists of an iterative team project, during which teams have the opportunity to identify a need that they care about, prototype solutions both on paper and in App Lab, and test solutions with real users to get feedback and drive further iteration.

3rd Additional Day – Agenda focuses on Unit 5: Data and Society

Unit 5 is about the importance of data in solving problems and highlights how computers can help in this process. The first chapter explores different systems used to represent information in a computer and the challenges and tradeoffs posed by using them. In the second chapter you'll learn how collections of data are used to solve problems, and how computers help to automate the steps of this process. The

chapter concludes by considering how the data problem solving process can be applied to an area of your choosing.

4th Additional Day – Agenda focuses on Unit 6: Physical Computing

Unit 6 explores the role of hardware platforms in computing and how different sensors can provide more effective input and output than the traditional keyboard, mouse, and monitor. Using App Lab and Adafruit’s Circuit Playground, you’ll develop programs that utilize the same hardware inputs and outputs that you see in the smart devices, looking at how a simple rough prototype can lead to a finished product. The unit concludes with a design challenge to use the Circuit Playground as the basis for an innovation of your own design.

Follow up: Follow up from the initial 5 days occurs through the 4 additional days.

Standards Covered: 6-10.NI.1-2, 6-10.HS.1-5, 6-10.T.1, 6-10.PSA.1-3, 6-10.DCA.1, 6-8.DD.1, 6-10.A.1, 6-10.E.1, 6-10.C.1, 6-10.IP.1-3, 6-10.IC.1, 6-10.SI.1-2, 6-10.SE.1-4, 6-10.RU.1-4, 6-10.DI.1

Credentials: 1. Computational thinking, problem solving, and algorithms; 2. Digital citizenship and cybersecurity; 3. Technology systems hardware and software; 4. Information literacy and data use; and 5. Impacts of computing.

Code.org Computer Science Principles (5 Initial Days plus 4 Additional days, 72 hours, Level 2 Credential)

For teachers of grades 9-12.

Description: Computer Science Principles introduces students to the foundational concepts of computer science and challenges them to explore how computing and technology can impact the world. More than a traditional introduction to programming, it is a rigorous, engaging, and approachable course that explores many of the foundational ideas of computing so all students understand how these concepts are transforming the world we live in.

The Code.org Professional Learning Program is designed to promote growth by providing space for you to become comfortable with curricular materials, CS content, and pedagogy. The program supports teachers with diverse teaching backgrounds as they prepare to teach CS Principles.

Daily agenda:

5 Initial Days: <https://curriculum.code.org/media/uploads/Screen-Shot-2019-04-21-at-9.09.58-PM.png>

Agenda focuses on the first semester of content for the course which includes Unit 1: The Internet and Unit 2: Digital Information

Unit 1 explores the technical challenges and questions that arise from the need to represent digital information in computers and transfer it between people and computational devices. The unit then explores the structure and design of the internet and the implications of those design decisions.

Unit 2 further explores the ways that digital information is encoded, represented, and manipulated. Being able to digitally manipulate data, visualize it, and identify patterns, trends, and possible meanings are important practical skills that computer scientists do every day. Understanding where data comes from, having intuitions about what could be learned or extracted from it, and being able to use computational tools to manipulate data and communicate about it are the primary skills addressed in the unit.

1st Additional Day – Agenda focuses on Unit 3: Intro to Programming

Unit 3 introduces the foundational concepts of computer programming, which unlocks the ability to make rich, interactive apps. This course uses JavaScript as the programming language, and App Lab as the programming environment to build apps, but the concepts learned in these lessons span all programming languages and tools.

2nd Additional Day – Agenda focuses on Unit 4: Big Data and Privacy

Unit 4 focuses on the data-rich world we live in and introduces many complex questions related to public policy, law, ethics, and societal impact. The goals of this unit are to develop a well-rounded and balanced view about data in the world, including the positive and negative effects of it, and to understand the basics of how and why modern encryption works.

3rd Additional Day – Agenda focuses on Chapter 1 of Unit 5: Building Apps and the Create Performance Task Prep Unit

Unit 5 continues the introduction of foundational concepts of computer programming, which unlocks the ability to make rich, interactive apps. This course uses JavaScript as the programming language, and App Lab as the programming environment to build apps, but the concepts learned in these lessons span all programming languages and tools

The Create Performance Task Prep lessons are here to help you understand, prepare for, and do the AP Create Performance Task.

4th Additional Day – Agenda focuses on Chapter 2 of Unit 5: Building Apps and AP Test Prep

Follow up: Follow up from the initial 5 days occurs through the 4 additional days.

Standards Covered: 9-12.NI.1-2, 9-12.HS.1-3, 9.T.1, 9-12.PSA.1, 9-12.DCA.1, 9-12.A.1, 9-12.E.1, 9-12.C.1, 9-12.IP.1-3, 9.IC.1, 9-12.SI.1, 9-12.SE.1-4, 9-12.RU.1-4, 9-12.DI.1

Credentials: 1. Computational thinking, problem solving, and algorithms; 2. Digital citizenship and cybersecurity; 3. Technology systems hardware and software; 4. Information literacy and data use; and 5. Impacts of computing.

Minecraft (1 Day, 8 hours, Cafeteria option)

Description: Participants will learn how to obtain and license Minecraft and use Minecraft in the classroom to help students unlock their creative potential. Explore other free resources and tools that will take learning and student engagement to a new level and identify how Minecraft can be used in your content area. Practice creating learning experiences for your students in the Minecraft environment.

Daily agenda:

Install and set up Minecraft Education Edition and navigate menus and settings. Set up a Minecraft Edu world and navigate different game modes and difficulties. Understand ways to walk, swim, use slash commands, learn the x, y, and z coordinates for teleporting and fill commands, and use blocks to apply recipes for crafting tools. Explore how to use Code Builder in Minecraft. Learn the requirements for setting up a multiplayer world, how to join someone else's world, and how to have students join your world. Explore the Classroom Mode to control your world, have students interact in the same world, and how to communicate with your students in Minecraft. Begin to lay the foundation for establishing a positive learning community with your students. There will be time allotted to plan your classroom integration with Minecraft to develop your academic purpose and to explore classroom management best practices. Review typical Minecraft lesson plans to develop your plan for integrating Minecraft into your classroom.

Standards Covered: 3-5.HS.2, 3-5.T.1, 3.PSA.1-2, 4-5.PSA.2-3, 3.DD.1-2, 4.DD.1, 5.DD.1-2, 3.SE.1-2, 4.SE.1-2, 3-5.RU.1-4, 3-5.DI.1, 6-8.HS.1-3, 6-8.T.1, 6.PSA.1-3, 7-8.PSA.1-2, 6-8.DD.1, 6-8.SI.1-2, 6-8.SE.1, 6-8.RU.1-4, 6.DI.1, 9-12.HS.1-2, 9-12.T.1, 9-12.PSA.1, 9-12.RU.1-4, 9-12.DI.1

Follow up:

Credentials: 1. Computational thinking, problem solving, and algorithms; 2. Digital citizenship and cybersecurity; 3. Technology systems hardware and software; 4. ~~Information literacy and data use~~; and 5. ~~Impacts of computing~~.

CYBER.ORG Cyber Society (8 hours over a month period, Cafeteria option) (combination asynchronous and synchronous)

Description: Teachers will explore the Cyber Society course within the CYBER.ORG library. Cyber Society has a Media Literacy unit and other topics under Ethics and Communities that explore skills students need to be cyber safe and smart.

Daily agenda:

Explore and define how Law, Politics, and Terrorism are related to Cyber (short video with information)

Review Intellectual Property Lesson (Flipgrid response)

Explore and define how Ethics and Communities are related to Cyber (short video with information)

Review Dramatic Tableau Lesson (1.5 hour virtual session)

Explore and define how Business and AI are related to Cyber (short video with information)

Review the Data Threats Lesson (Flipgrid response)

Explore and define how Media Literacy is related to Cyber (short video with information)

Complete an AICS – Protests in Chicago (1.5 hour virtual session)

Follow up: Final 1.5 hour session will be a culmination of what has been discussed through the Analysis and Investigation of Cyber Scenario

Standards Covered: 9-12.A.1, 9-12.E.1, 9-12.C.1, 9-12.IP.1-3, 9-12.IC.1, 9-12.SI.1, 9-12.SE.1-4, 9-12.RU.1-4

Credentials: ~~1. Computational thinking, problem solving, and algorithms;~~ 2. Digital citizenship and cybersecurity; ~~3. Technology systems hardware and software;~~ 4. Information literacy and data use; and 5. Impacts of computing.

Cafeteria Plan in Development:

Digital Citizenship (currently being revamped) (8 hours)

- Explore resources and information about digital citizenship to prepare you and your students for a positive digital experience.

Computational Thinking (8-16 hours)

- Teachers will explore this curriculum that combines decomposition, pattern recognition, abstraction, and algorithm design into a project-based approach to learning in core subject areas.

1 Day CYBER.ORG Middle School (8 hours)

- Explore how STEM EDA (Explore, Discover, Apply) uses hands-on projects and the Engineering Design Process and can be incorporated into middle school curriculum. Teachers will come to understand the progression of the curriculum and practice short examples.

Cybersecurity (8 hours)

- Teachers will explore security tools, understand how various cyberattacks operate, and learn to detect and mitigate attacks.

Cyber Fundamentals (micro:bit) (8 hours)

- Introduces teachers to the foundational concepts of coding and robotics through project-driven, hands-on modules based around the micro:bit.