

4-H Computer Science Pathway Resources

Area of interest: Coding- Learning Programming language

Website	Description	Curriculum/ Link	Age Group
Discover	The Discover 4-H Clubs series guides new 4-H volunteers through the process of starting a 4- H computer science club or provides a guideline for seasoned volunteers to try a new project area.	Discover - 4-H Code Clubs	For beginner, Grades K- 8
		Discover 4-H Scratch Code Clubs	For intermediate coders ages 9-14
		Discover - 4-H Python code Clubs	For advanced coders grades 9-12
Discovering Computer Science & Programming through Scratch: Level 1 Youth Guide	Introduces young people to five fundamental principles of computer programming, providing a foundation for exploring and creating.	Discovering Computer Science & Programming through Scratch: Level 1 Youth Guide	Grades 5 to 12
Discovering Computer Science & Programming through Scratch: Level 1 Facilitator Guide	This guide assists facilitators of the above mentioned youth guide with basic skills necessary to lead a beginning Scratch programming club.	Discovering Computer Science & Programming through Scratch: Level 1 Facilitator Guide	Grades 5 to 12

Online Resources

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Website	Description	Curriculum/ Link	Age Group
Code.org	Serves to teach youth how computer programmers use geometry and algebra to develop video games.	Juniors	Grades K-5
	Will help youth explore and develop complex scientific models through agent-based programming.	Intermediates	Grades 6-8
	This course is designed to broaden youth's participation in computer science.	Seniors	Grades 9-12
	This is an advanced placement course that covers a wide range of computer science topics.	Seniors- Advanced	Grades 9-12
Scratch	Scratch makes it easy for youth to create their own interactive stories, animations, games, music and art. It's also a social network that allows youth to share their creations online.	http://scratched.media.mit.edu/	Grades 4-8
Google CS First	No CS experience is required to begin. Each CS First club is based on a real-world theme and offers about 10 hours of lessons and activities. The different club themes aim to attract and engage youth of varying backgrounds and interests.	https://www.cs-first.com/en/home	4th - 8th grades (or between the ages of 9 - 14)

Online Resources

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Website	Description	Curriculum/ Link	Age Group
Made with code	Made w/ Code is an online learning site that was developed for girls to get them enthused about coding. The website states: "If we can inspire teen girls to see that code can help them pursue their passions, whatever they may be, then hopefully they will begin to contribute their voices to the field of technology for the benefit of all."	https://www.madewithcode.com/home/	Grades 6 to 12
CodeChangers	The CODECHANGERS offers a unique technology education experience with an online, self-paced program that is easy to use and carefully mixed with hands-on activities designed to help inspire creativity and connection to real-world projects.	https://codechangers.com/about/	Grade 3 and up
Blockly Games	Blockly Games is a series of activities that teach programming. It is designed for children who have not had prior experience with computer programming. By the end of these games, players are ready to use conventional text-based languages.	https://blockly-games.appspot.com	Grade 4 and up
Hack Club	Structure for starting a coding club with hackathon-style meetings	http://hackclub.com	high school
Free Code Camp	"We're a community that helps you learn to code, then get experience by	https://www.freecodecamp.org/	high school+

	contributing to open source projects used by nonprofits."		
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Online Resources:

Area of interest: Coding- Developing Applications for mobile phones

Website	Description	Curriculum/ Link	Age Group
AppInventor	MIT App Inventor is an innovative beginner's introduction to programming and app creation that transforms the complex language of text-based coding into visual, drag-and- drop building blocks. The simple graphical interface grants even an inexperienced novice the ability to create a basic, fully functional app within an hour or less.	http://appinventor.mit.edu/explore/index-2.html	Grades 6 to 12

Online Resources:

Area of interest: Coding- Developing Video Games

Website	Description	Curriculum/ Link	Age Group
Alice	This is a 3D programming platform that makes it simple to create an animation for playing an interactive game, telling a story or a video to share online.	http://www.alice.org/	Grades 6 to 8
Kodu	Kodu allows youth to create games on their PC and even an XBox. Aside from computer programming, Kodu can be used to teach creativity, problem solving and storytelling.	http://www.kodugamelab.com/	Grades 4 and up

Online Resources:

Area of interest: Educational Courses

Coursera.org and EdX.org offer a wide variety of CS-related courses. Each course is like an interactive textbook, featuring pre-recorded videos, quizzes and projects. These 12 week courses are free, however, for a nominal fee you will have access to all of the features and content you need to earn a course certificate. The following courses are recommended for older youth and adult volunteers.

- edX.org – Programming in Scratch <https://www.edx.org/course/programming-scratch-harveymuddx-cs002x-1>
- Coursera – Programming for Everybody (Getting Started with Python) <https://www.coursera.org/learn/python>
- edX.org – Introduction to Computing using Python <https://www.edx.org/course/introduction-computing-using-python-gtx-cs1301x>
- edX.org – How to Code: Simple Data <https://www.edx.org/course/how-code-simple-data-ubcx-htc1x>
- edX.org – Introduction to Java Programming <https://www.edx.org/course/introduction-java-programming-part-1-hkustx-comp102-1x-3>
- edX.org – Programming with C# <https://www.edx.org/course/programming-c-microsoft-dev204x-3>
- MIT Open Courseware <https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-092-introduction-to-programming-in-java-january-iap-2010/>
- Khan Academy – Learn the basics <https://www.khanacademy.org/computing/computer-programming>
- Udemy.com – Learn coding online <https://www.udemy.com>

Offline resources:

The following is a list of unplugged lessons/activities to use in clubs to teach the fundamentals of CS, whether you have computers or not. Try using these lessons as stand-alone or complementary activities.

Website	Description	Curriculum/ Link	Age Group
Code.org	Teach the fundamentals of CS, whether you have computers in your club or not.	https://code.org/curriculum/unplugged	Grade K to 5
CS Unplugged	CS without a computer	http://csunplugged.org	Grades K to 9
Kids Code CS	Computer Science Unplugged is a free curriculum created by teachers and researchers for kids.	https://www.kidscodecs.com/coding-kids-ages-5-to-8/	Grades K to 3