



CodeHS

New York Computer Science 7-8

1 Semester for Middle School (50-60 contact hours)

Course Overview and Goals

New York Computer Science 7-8 is fully aligned to the New York State Computer Science and Digital Fluency Learning Standards for students in grades 7 through 8. Students will learn concepts in the framework including: Impacts of Computing, Computational Thinking, Networks & System Design, Cybersecurity, and Digital Literacy.

Learning Environment: The course utilizes a blended classroom approach. The content is fully web-based, with students writing and running code in the browser. Teachers utilize tools and resources provided by CodeHS to leverage time in the classroom and give focused 1-on-1 attention to students. Each unit of the course is broken down into lessons. Lessons consist of video tutorials, short quizzes, example programs to explore, and written programming exercises, adding up to over 100 hours of hands-on programming practice in total. Each unit ends with a comprehensive unit test and project that assesses student's mastery of the material from that unit.

Programming Environment: Students write and run programs in the browser using the CodeHS online editor. Students write text based programs using a modified JavaScript library with Karel and p5.js.

Prerequisites: The New York Computer Science 7-8 course is designed for complete beginners with no previous background in computer science. The course is highly visual, dynamic, and interactive, making it engaging for new coders.

More information: Browse the content of this course at <https://codehs.com/course/20480/overview>

Course Breakdown

Module 1: Exploring Digital Citizenship (2 weeks/10-12 hours)

In this module, students learn about Internet etiquette and how to stay safe on the world wide web.

Browse the full content of this module at <https://codehs.com/course/20480/explore/module/28323>

Objectives / Topics Covered	• Digital Footprint and Reputation • Cyberbullying • Internet Safety • Privacy & Security • Information Literacy • Creative Credit & Copyright • Hacking Ethics
Example Assignments	• Build a Positive Digital Footprint ◦ Reflect on your social media activity. Give an example of a social media post that builds a positive digital footprint. Give an example of a social media post that builds a negative digital footprint. • Final Project: Create a Public Service Announcement ◦ Create a Public Service Announcement (PSA) to teach your peers about your selected topic in digital citizenship and cyber hygiene. You could make a video, song, poster, or slideshow.

Module 2: Exploring Programming with Karel (2 weeks/10-12 hours)

In this module, students learn the basics of programming by giving Karel the Dog commands in a grid world.

Browse the full content of this unit at <https://codehs.com/course/20480/explore/module/28324>

Objectives / Topics Covered	• Commands • Functions • Conditionals • Looping • Control Flow
Example Assignments	• Program-specific tasks for Karel the Dog ◦ Example Exercise: Tennis Ball Game Setup Karel's getting ready to play a tennis ball game with friends at the dog park. Karel wants to hide 4 tennis balls around the dog park. Help Karel get the game setup by programming Karel to put one tennis ball on each of the purple squares around the dog park. • Teach Karel new commands like <code>turnRight()</code> or <code>makeStack()</code> ◦ Example Exercise: Tennis Ball Stacks Karel is setting up stacks of tennis balls for a game with friends. The stacks of tennis balls need to be placed on the cement squares in the 2nd, 4th, and 6th columns. Each stack should have three tennis balls. Create a function called <code>makeStack()</code> to help Karel create the tennis ball stacks. • Using control structures and conditionals to solve general problems ◦ Example Exercise: Karel's Race Your task is to get Karel to move around the racetrack eight times, and end up back in the starting position. Every time Karel hits a corner, Karel should put a ball down. Then at the end of the race there should be 8 balls on each corner.

Module 3: Exploring Computing (2 weeks/10-12 hours)

In this module, students explore different technologies and the impact they have on our world.

Browse the full content of this unit at <https://codehs.com/course/20480/explore/module/42306>

Objectives / Topics Covered	• History of Computing • How Software Works • Computer Hardware • Cloud Computing • Internet of Things • Ethics and Legal Considerations • Future of Computing • Project: Design the Computer Device of Tomorrow
Example Assignments	• History of Computing ◦ <i>Jigsaw: Computer Interaction Over the Decades:</i> In this activity, students are going to work in small groups to research what it was like to interact with computers over the various decades. For each section, students will want to consider what was typical for most

	computers. For example, GUI interfaces were first used in the 1970s, but they were not typical until the 1980s. • Cloud Computing ◦ <i>Case Study: Cloud Computing vs. Physical Computing:</i> Is cloud computing more efficient? Is physical computing the way to go? Students will read through a case study for a middle school that needs to decide between implementing a cloud computing solution or a physical computing solution. What are the pros and cons of each? Which way would you ultimately choose to implement?
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Module 4: Exploring the Internet (2 week/10-12 hours)

In this module, students learn network protocols and different strategies used to protect online information.

Browse the full content of this unit at <https://codehs.com/course/20480/explore/module/28321>

Objectives / Topics Covered	• What is the Internet • The Need for Protocols • Impact of the Internet • Cybersecurity • The CIA Triad • Encryption
Example Assignments	• Encrypt and Decrypt ◦ Explore the following simulation to practice encrypting and decrypting a message using a key. Create a message to encrypt and decide on a key. The key can be a word or a number (or a combination). Do you think you'd be able to decode and crack this message without the key? • Final Project: Steganography ◦ In the following activity, you will see a picture and the corresponding color codes associated with the pixels. There is a message hidden in the first 12 pixels! Your mission will be to reverse the process and find the secret message!

Module 5: Exploring Art with Code (2 week/10-12 hours)

In this module, students explore the intersection of art and technology by creating sketches using p5.js.

Browse the full content of this unit at <https://codehs.com/course/20480/explore/module/28372>

Objectives / Topics Covered	• Color Theory • Color Transitions • Color Transformations • Shape Transformations • Direction • Animation • Interactivity
Example Assignments	• Final Project: Animate an Emoji ◦ Create an animated sketch of an emoji. An emoji is a small icon used to represent an emotion, symbol, or object. Complete the

	project proposal to plan your sketch and then use drawing and color functions we have learned so far to create it using p5.js.
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