



2nd Grade Massachusetts Digital Literacy and Computer Science Course Syllabus

One Year for Elementary School, 36 Hours

Course Overview and Goals

The 2nd Grade Massachusetts Digital Literacy and Computer Science course introduces students to foundational programming concepts through a block-based programming language. Students will develop computational thinking and problem-solving skills while learning to create interactive projects, animations, and games. This course emphasizes creativity and collaboration, providing students with a solid base in computer science concepts and digital literacy.

Learning Environment: This course is teacher-led and includes ready-to-use lessons following a consistent structure: Introduction, Guided Practice, Independent Practice, Extension, and Reflection. Instruction follows an “I do, we do, you do” model and incorporates spiral review to reinforce concepts and build confidence over time. The course includes 36 lessons, each approximately 45 minutes long, providing a full year of instruction when taught once per week. While the course allows for instructional flexibility, some lessons are required to fully meet state computer science standards and are clearly identified within the syllabus. All Digital Literacy lessons are required to ensure full standards alignment, as they address essential non-programming computer science concepts. Required lessons are labeled with the specific standards they address to support planning and compliance.

Standards Alignment Note: Lessons that list “*Standards Met*” (below) are required to fully meet state computer science standards. Lessons without a standards tag support spiral review, practice, or enrichment.

Programming Environment: Students will write and run programs that are saved in students’ accounts. The environment supports interactive, hands-on programming, enabling students to create and debug projects in a user-friendly interface.

Assessments: Some units conclude with a brief 4-question quiz designed to assess student understanding of the concepts and skills introduced in the unit. Quizzes can be assigned digitally, completed as a QuizBuzz activity, or printed for paper-based completion.

Prerequisites: There are no prerequisites for this course. It is designed to support all learners, regardless of prior computer science experience.

More Information: Browse the content of this course at <https://codehs.com/course/28647/overview>



A clickable PDF can be found at https://codehs.com/MA_Roadmaps

Course Breakdown

Optional Review

Reviews Kindergarten and 1st grade programming basics — logging in, events, and loops — for students who need extra practice before moving into 2nd grade content.

Objectives / Topics Covered	• Review the programming interface and events • Review repeat loops
Lessons	Welcome to CodeHop! • Log in and use the CodeHopJr Playground. Introduction to Programming • Navigate the programming interface to create a scene with characters. Events • Explain what an event is and use multiple event blocks in a program. Introduction to Repeat Loops • Use repeat loops to run a section of code multiple times. Forever Loop Dance Party • Create a sequence using a “repeat forever” loop to make characters repeat actions. Introduction to Message Events • Program a relay race that uses messages to make characters interact.

Unit 1: Getting Started (1 lesson)

Introduces students to computational thinking through a school-day-routines activity that kicks off the year.

Objectives / Topics Covered	• Identify patterns and sequence steps in a routine • Break down and simplify a multi-step process
Lessons	Computational Thinking: School Day Routines (K-2.CT.b.1, K-2.CT.b.2, K-2.CT.b.3) • Use computational thinking to identify patterns and sequence steps in a school-day routine.

Unit 2: Sequences & Events (3 lessons)

Introduces the grid as a tool for precise movement and continues building debugging skills with events and sequences.

Objectives / Topics Covered	• Use the grid to move characters to specific locations • Find and fix errors in a program
Lessons	Introduction to the Grid (2 classes K-2.DTC.a.3) • Use the grid feature to move characters to a specific location on the stage. Debugging: Events and Sequences • Find and fix errors in provided code. 2nd Grade Getting Started, Sequences & Events Quiz (4 questions)

Unit 3: Loops (4 lessons)

Expands on loops from earlier grades with timers, peer feedback, and algorithms for moving characters along a path.

Objectives	• Create programs using loops and timers
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/ Topics Covered	- Revise a program based on peer feedback - Create and adjust simple algorithms
Lessons	Loops: Follow the Path - Identify patterns and create a program using loops. Making a Timer - Use loops, wait blocks, and turn blocks to create and compare two timers with different speeds. Two-Step Dance & Feedback (K-2.CAS.b.4, K-2.DTC.b.1) - Create a program, revise it based on peer feedback, and give attribution to a peer who helped improve the work. Algorithms: Connecting a Path (K-2.CT.b.3) - Create and adjust simple algorithms to move characters based on their size, shape, and starting position. 2nd Grade Loops Quiz (4 questions)

Unit 4: Message Events (5 lessons)

Builds on message events with multi-page programs, cycles, debugging, and the design process.

Objectives / Topics Covered	- Use message events to control program flow and model cycles - Navigate between pages using messages - Use the design process to plan and improve a program
Lessons	Message Events: Scout Plays in the Forest - Use message events to control the flow of a program. Programming a Cycle - Use message events to model a cycle. Pages: Scout's Travels - Use messages to help Scout travel between pages in a program. Debugging: Message Events and Loops - Find and fix message event and loop errors in provided code. Exploring the Design Process - Use the design process to plan, create, and improve a program with loops that models a solution to a real-world problem. 2nd Grade Message Events Quiz (4 questions)

Unit 5: Culmination Projects (7 lessons)

Students apply the year's programming skills across three culminating projects: a coding review, a racing game, and a moving-targets game.

Objectives / Topics Covered	- Use a variety of coding blocks and explain their function - Create an interactive game with events, loops, and messages - Combine sequences, events, and pages in an original project
Lessons	Code Block Review (2 classes K-2.DTC.b.3) - Use a variety of coding blocks in a program and explain their function within the program. Racing Game (2 classes K-2.DTC.a.4, K-2.DTC.b.3, K-2.CT.d.3) - Create an interactive racing game with events, loops, and messages. Moving Targets Game (3 classes K-2.DTC.a.4, K-2.CT.d.3) - Create a moving-target game using sequences, events, and pages. 2nd Grade Culmination Projects Quiz (4 questions)

Unit 6: Computing Systems (3 lessons)

Explores how computers work, how people collaborate digitally, and how devices connect over networks.

Objectives / Topics Covered	- Identify computer input, output, hardware, and software - Collaborate digitally with others - Describe how networks connect devices
Lessons	Keyboarding Basics (K-2.DTC.a.1, K-2.DTC.a.2, K-2.CS.a.4) - Use a keyboard to type simple words and sentences. Computer Basics: Connections - Identify a computer's input, output, hardware, and software, and explain how they work together. Collaborating Digitally - Collaborate with others digitally to create a program telling about their classrooms. Exploring Computer Networks - Describe how networks connect devices to share information and model sending and receiving information using message blocks. 2nd Grade Computing Systems Quiz (4 questions)

Unit 7: Safety & Responsibility (2 lessons)

Introduces digital citizenship, digital footprints, and responsible technology use.

Objectives / Topics Covered	- Explain what it means to be a responsible digital citizen - Demonstrate safe and responsible technology use
Lessons	Responsible Digital Citizens (K-2.CAS.a.5, K-2.CAS.a.6, K-2.CAS.a.7, K-2.CAS.a.8, K-2.CAS.b.1) - Explain what it means to be a responsible digital citizen, including digital footprints, cyberbullying, and how to report concerns. Practicing Responsible Technology Use (K-2.CAS.b.2) - Demonstrate ways to use technology safely and responsibly. 2nd Grade Safety & Responsibility Quiz (4 questions)

Unit 8: Data & Analysis (5 lessons)

Introduces students to investigative questions, surveys, data storage, and choice-based research projects.

Objectives / Topics Covered	- Develop a question and collect data using a survey - Explain how computers store data as files - Collect and assess sources to answer a research question
Lessons	Data Explorers (2 classes K-2.CT.c.1, K-2.CT.c.2, K-2.CT.c.3, K-2.CT.c.4) - Develop an investigative question, collect data using a survey, and create a program to present the data visually. Managing Data Storage and Files (K-2.CT.c.5) - Recognize that computers store data as files and model how data is collected and stored. Choice Research (2 classes K-2.DTC.c.1, K-2.DTC.c.2, K-2.DTC.c.3, K-2.CT.c.2) - Collect and assess sources to answer a research question and communicate findings visually. 2nd Grade Data & Analysis Quiz (4 questions)

Unit 9: Impacts of Computing (2 lessons)

Explores how computing shapes careers and everyday life through fashion-retail and community-focused projects.

Objectives / Topics	- Explain how coding helps improve designs in a career field - Identify computing devices in daily life and explain how technology has changed how
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Covered	people live and work
Lessons	Careers in CS: Fashion-Retail (K-2.CAS.c.5) - Explain how coding helps create and improve fashion designs and create a program to design and animate a fashion character. Impacts of Computing: Changing World (K-2.CAS.c.5) - Identify examples of computing devices in daily life and use programming to explain how technology has changed how people live, work, and play.

Unit 10: AI Exploration (2 lessons)

Introduces how AI assistants answer questions and how tools like AutoDraw use AI to recognize and suggest drawings.

Objectives / Topics Covered	- Explain how AI assistants help people and change jobs - Describe how a classifier recognizes and suggests drawings
Lessons	How AI Helps Us (K-2.CS.b.2) - Explain how AI assistants answer questions and describe how AI helps people by solving problems and changing jobs. Machine Learning: AutoDraw - Describe how AutoDraw uses AI and a classifier to recognize and suggest drawings. 2nd Grade Impacts of Computing & AI Exploration Quiz (4 questions)

Unit 11: Preparing for Next Year (2 lessons)

Transitions students from CodeHopJr to the CodeHop Blocks editor they'll use in 3rd grade.

Objectives / Topics Covered	- Navigate the CodeHop Blocks editor - Create a program using an event and a loop in CodeHop Blocks
Lessons	From CodeHopJr to CodeHop Blocks - Navigate the basic interface of the CodeHop editor to create a simple program. From CodeHopJr to CodeHop Blocks: Part 2 - Create a CodeHop program that uses an event and a loop.

2nd Grade Massachusetts Digital Literacy and Computer Science Supplemental Materials

Resources	Description
Parent Welcome Letter (Spanish)	Send this letter home to introduce families to their new computer science curriculum.
Warm-Up Activities	This warm-up activity slide deck provides 5-10 minute problems aligned with computer science skills to engage students at the start of class, allowing teachers to preview or review concepts with answer keys and discussion tips included in the Speaker Notes.
Program Self-Assessment (Spanish)	This is a student self-assessment tool designed to help K-6 learners reflect on their programming projects, evaluate their skills in algorithms, debugging, collaboration, and reflection, and set goals for improvement.

Peer Review Resources (Spanish)	This provides structured worksheets to facilitate student feedback during collaborative coding projects. It encourages reflection by guiding students to highlight successes, ask questions, and offer constructive feedback on their partner's work.
Lesson Reflection & Computational Thinking (Spanish)	This guides students in engaging with computational thinking concepts, preparing for discussions, reflecting on lessons, and applying their learning to real-world problem-solving.
These resources and more are found on the CodeHop Resources Page .	