Colorado 2nd Grade Computer Science Course Syllabus

One Year for Elementary School, 36 Hours

Course Overview and Goals

The **Colorado 2nd Grade Computer Science Course** introduces students to foundational programming concepts through a block-based programming language. Students explore digital literacy and computer science skills while engaging in lessons that integrate coding into math, science, English language arts (ELA), and social studies. This course emphasizes creativity, collaboration, and real-world connections, providing students with a strong foundation in both academic content, digital literacy, and computer science.

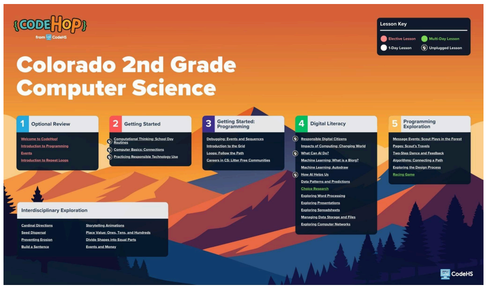
Learning Environment: This course is designed to be teacher-led, with ready-to-use lesson plans. Each programming lesson follows a structured format: **Introduction, Guided Practice, Independent Practice, Extension, and Reflection.** Many digital literacy lessons contain unplugged activities, requiring printed handouts and class activities to support hands-on learning.

The lessons are delivered in an **"I do, we do, you do"** format, ensuring a gradual release of responsibility and fostering confidence in students as they learn. Teachers can adapt the content to fit their schedule and instructional needs. The concepts taught in this course spiral across grade levels, ensuring that students can revisit and build upon their understanding year after year, even if all lessons are not completed within a single year. The course includes a total of **36 lessons,** each approximately 45 minutes long. This provides a full school year of material if teaching one lesson per week.

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.

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/CO_2/overview



Colorado 2nd Grade Computer Science

Lesson Key
🟥 Elective Lesson
🟩 Multi-Day Lesson
○ 1-Day Lesson
✋ Unplugged Lesson

1 Optional Review
- Welcome to CodeHop!
- Introduction to Programming
- Events
- Introduction to Repeat Loops

2 Getting Started
- ✋ Computational Thinking: School Day Routines
- ✋ Computer Basics: Connections
- ✋ Practicing Responsible Technology Use

3 Getting Started: Programming
- Debugging: Events and Sequences
- Introduction to the Grid
- Loops: Follow the Path
- Careers in CS: Litter Free Communities

4 Digital Literacy
- ✋ Responsible Digital Citizens
- Impacts of Computing: Changing World
- ✋ What Can AI Do?
- Machine Learning: What is a Blorg?
- Machine Learning: Autodraw
- ✋ How AI Helps Us
- Data Patterns and Predictions
- Choice Research
- Exploring Word Processing
- Exploring Presentations
- Exploring Spreadsheets
- Managing Data Storage and Files
- Exploring Computer Networks

5 Programming Exploration
- Message Events: Scout Plays in the Forest
- Pages: Scout's Travels
- Two-Step Dance and Feedback
- Algorithms: Connecting a Path
- Exploring the Design Process
- Racing Game

Interdisciplinary Exploration
- Cardinal Directions
- Seed Dispersal
- Preventing Erosion
- Build a Sentence
- Storytelling Animations
- Place Value: Ones, Tens, and Hundreds
- Divide Shapes into Equal Parts
- Events and Money

A clickable PDF can be found at https://codehs.com/CO-K-5Roadmaps

Course Breakdown

Optional Review

This optional review unit is designed to support students who would benefit from additional practice before or after completing core lessons.

Objectives / Topics Covered	● Log in and navigate the Playground. ● Explore and interact with the CodeHop environment. ● Use sequences and loops to animate characters.
Lessons	**Welcome to CodeHop!** ● Learn how to log in and explore the Playground; a brief introduction that can be used on its own or before starting a full lesson. **Introduction to Programming** ● Navigate the CodeHop interface and create a scene using characters. **Events** ● Explain events in programming and use event blocks to trigger actions. **Introduction to Repeat Loops** ● Use repeat loops to run a section of code multiple times.

Unit 1: Getting Started (3 lessons)

In this unit, students will explore the basics of computing by learning the functions of computers and their components and apply foundational computational thinking skills like pattern recognition, sequencing, and task decomposition to real-life routines.

Objectives / Topics Covered	● Recognize the basic parts of a computer. ● Practice computational thinking in everyday routines.
Lessons	**Computational Thinking: School Day Routines** ● Identify patterns, sequence steps, and break down tasks using evening routines as an example. ● *Standard Met: CS.2.2.1a* **Computer Basics: Connections** ● Learn what a computer is, how it works, and how hardware, software, input, and output work together. **Practicing Responsible Technology Use** ● Demonstrate ways to use technology safely and responsibly. ● *Standard Met: CS.2.6.1a*

Unit 2: Getting Started: Programming (4 lessons)

In this unit, students will create basic programs while learning about events, sequences, and loops. Students will practice debugging their programs to solve simple problems.

Objectives / Topics Covered	● Debug sequences in a program. ● Plan character movement using the grid. ● Use loops to repeat actions.
Lessons	**Debugging: Events and Sequences** ● Find and fix errors in a program. ● *Standard Met: CS.2.3.1b*

	Introduction to the Grid ● Use the grid to move characters to specific locations. **Loops: Follow the Path** ● Identify patterns and create a program using loops. **Careers in CS: Litter Free Communities** ● Explore how CS can address community problems by creating a program that collects and sorts litter.

Unit 3: Digital Literacy (14 lessons)

In this unit, students will learn what it means to be a responsible digital citizen by identifying appropriate behavior and following laws. Students will also explore digital literacy concepts such as AI, data and research, and types of software.

Objectives / Topics Covered	● Behave respectfully online. ● Model how computers store information. ● Collect and represent data. ● Model how networks function. ● Interact with software tools.
Lessons	**Responsible Digital Citizens** ● Understand digital footprints, cyberbullying, and appropriate ways to report online concerns. ● *Standard Met: CS.2.6.1a* **Impacts of Computing: Changing World** ● Explain how technology has changed the way people live, work, and play. ● *Standards Met: CS.2.5.1e* **What Can AI Do?** ● Identify tools that use AI, understand how AI learns from data, and compare human tasks vs. AI tasks. ● *Standards Met: CS.2.5.1e, CS.2.5.2a* **Machine Learning: What is a Blorg?** ● Explain how AI can learn information. ● *Standards Met: CS.2.5.1a, CS.2.5.1b* **Machine Learning: AutoDraw** ● Describe how AutoDraw uses AI. ● *Standards Met: CS.2.5.1a, CS.2.5.1b, CS.2.5.1c* **How AI Helps Us** ● Observe how AI assistants answer questions and learn how AI supports people in different tasks. ● *Standards Met: CS.2.5.1b, CS.2.5.1c, CS.2.5.1d, CS.2.5.2b, CS.2.5.2c* **Data Patterns and Predictions** ● Identify patterns and trends in data visualizations and create a program to communicate predictions. **Choice Research (2 part lesson)** ● Gather information from sources and present findings visually. ● *Standard Met: CS.2.6.1b* **Exploring Word Processing** ● Use word processing tools to create a document about a favorite season. ● *Standard Met: CS.2.3.1a* **Exploring Presentations** ● Create a presentation using basic slide-editing features to share personal interests. ● *Standard Met: CS.2.3.1a* **Exploring Spreadsheets** ● Use spreadsheet software to review and present data on class pets and favorite colors. ● *Standard Met: CS.2.3.1a* **Managing Data Storage and Files** ● Recognize how computers store information as files and model basic data storage.

	Exploring Computer Networks ● Describe how networks connect devices and model sending and receiving information using message blocks.

Unit 4: Programming Exploration (7 lessons)

In this unit, students will gain basic programming skills using a block-based programming language. Students will practice with events, sequences, loops, and the design thinking process.

Objectives / Topics Covered	● Control character interaction using message events. ● Develop simple algorithms to solve problems. ● Use the design process to plan program improvements.
Lessons	**Message Events: Scout Plays in the Forest** ● Use message events to control the flow of a program. **Pages: Scout's Travels** ● Use messages to help Scout travel between pages in a program. **Two-Step Dance & Feedback** ● Create a program, revise it using peer feedback, and credit helpers appropriately. ● *Standard Met: CS.2.6.1b* **Algorithms: Connecting a Path** ● Create and adjust simple algorithms. **Exploring the Design Process** ● Plan, create, and improve a program to solve a real-world problem. ● *Standard Met: CS.2.2.1a* **Racing Game (2 part lesson)** ● Create an interactive racing game.

Unit 5: Interdisciplinary Exploration (8 lessons)

This unit integrates programming with subjects like social studies, math, science, and ELA, enabling students to model real-world concepts using events, messages, and interactive programs.

Objectives / Topics Covered	● Use sequences, loops, and messages to model concepts in social studies, math, science, and ELA.
Lessons	**Cardinal Directions** ● Use events to create an interactive compass rose. **Seed Dispersal** ● Model seed dispersal using message events and loops to show how animals help spread seeds. **Preventing Erosion** ● Create a program comparing different solutions that prevent wind or water erosion. **Build a Sentence** ● Make an interactive program that uses events to build and read sentences aloud. **Storytelling Animations** ● Retell a story in order using an animated program. **Place Value: Ones, Tens, and Hundreds** ● Program an activity that connects digit placement to number value using events. **Divide Shapes into Equal Parts** ● Animate circles and rectangles partitioned into equal parts. **Events and Money** ● Create a program that identifies the value of a set of coins.

2nd Grade Course 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**.	