Alabama Digital Literacy and Computer Science: 4th Grade Course Syllabus

One Year for Elementary School, 36 Hours

Course Overview and Goals

The **Alabama Digital Literacy and Computer Science: 4th Grade Course** introduces students to foundational programming concepts through a block-based programming language. Students explore digital literacy and computer science skills while learning to create interactive projects, animations, and games. This course emphasizes creativity, collaboration, and real-world connections, providing students with a strong foundation in computer science concepts and digital literacy.

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.** Instruction follows an "I do, we do, you do" model and incorporates spiral review to reinforce concepts and build confidence over time. Many digital literacy lessons contain unplugged activities, requiring printed handouts and class activities to support hands-on learning.

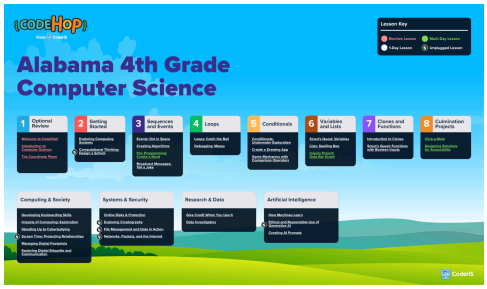
The course includes a total of **36 lessons,** each approximately 45 minutes long. The concepts taught in this course spiral across grade levels, ensuring that students can revisit and build upon their understanding year after year, even if all lessons are not completed within a single year.

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.

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/AL_4/overview



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

Course Breakdown

Optional Review

In this optional unit, students are introduced to key computer science vocabulary, practice logging into and navigating the Playground, and explore basic programming.

Objectives / Topics Covered	● Log in and navigate the Playground. ● Understand and use key computer science vocabulary. ● Create a simple program to demonstrate basic programming skills. ● Use the coordinate plane to position sprites.
Lessons	**Welcome to CodeHop!** ● Learn how to log in and explore the Playground to prepare for future lessons. **Introduction to Computer Science** ● Define key computer science vocabulary and create a simple program to apply foundational programming concepts. **The Coordinate Plane** ● Use the coordinate plane to position sprites and create an open-ended animation.

Unit 1: Getting Started (2 weeks)

In this unit, students apply computational thinking skills to design a school, using strategies like breaking down tasks, identifying patterns, and organizing ideas logically.

Objectives / Topics Covered	● Apply computational thinking skills. ● Learn about the components and functions of computing systems.
Lessons	**Exploring Computing Systems** ● Explore the components and functions of computing systems and learn basic troubleshooting techniques. ● *Standard Met: DLCS25.4.13* **Computational Thinking: Design a School** ● Apply computational thinking by breaking down tasks, identifying patterns, and organizing ideas to design a school layout. ● *Standard Met: DLCS25.4.3*

Unit 2: Sequences and Events (5 weeks)

In this unit, students deepen their understanding of events by programming with multiple event types and using broadcast messages to coordinate sprite interactions.

Objectives / Topics Covered	● Create programs using multiple types of event blocks to control when actions happen. ● Develop and compare algorithms to solve problems efficiently.
Lessons	**Events: Dot in Space** ● Create a program using multiple types of event blocks to trigger different actions. **Creating Algorithms** ● Write and compare different algorithms to determine which one best fits the goal of the program. ● *Standards Met: DLCS25.4.1, DLCS25.4.4, DLCS25.4.5* **Pair Programming: Create a Band (2 part lesson)** ● Work with a partner to design and code a musical band using keyboard inputs to control sprites. ● *Standard Met: DLCS25.4.23*

	Broadcast Messages: Tell a Joke ● Use broadcast messages to program sprites to tell a knock-knock joke.

Unit 3: Loops (2 weeks)

In this unit, students learn to use different types of loops to create a simple interactive game and understand how repetition can simplify code.

Objectives / Topics Covered	● Use different types of loops to simplify algorithms. ● Break down and analyze code to identify and fix errors.
Lessons	**Loops: Catch the Ball** ● Use two types of loops to create a simple interactive game where players catch a moving ball. **Debugging: Mazes** ● Break down and analyze a program to find and fix errors, focusing on loops and logical flow.

Unit 4: Conditionals (3 weeks)

Students explore conditional logic to make programs respond dynamically to different conditions and inputs.

Objectives / Topics Covered	● Use if/then and if/else blocks. ● Use conditionals to build interactive and reactive programs.
Lessons	**Conditionals: Underwater Exploration** ● Create a program that uses conditionals to control sprite behavior. **Create a Drawing App** ● Program keyboard and mouse inputs using loops and conditionals to create a drawing app. **Game Mechanics with Comparison Operators** ● Use operators and variables to create game end mechanics. ● *Standard Met: DLCS25.4.6*

Unit 5: Variables and Lists (4 weeks)

In this unit, students explore variables, lists, and comparison operators to manage and organize data in programs.

Objectives / Topics Covered	● Learn how variables store information. ● Use comparison operators to create more complex decision-making logic.
Lessons	**Scout's Quest: Variables** ● Create and use variables to track information such as points in a game. **Lists: Spelling Bee** ● Use lists to build a spelling bee game that stores and displays words. **Inquiry Project: Data Bar Graph (2 part lesson)** ● Follow the inquiry process to gather data and modify a program to display findings as a bar graph. ● *Standard Met: DLCS25.4.7*

Unit 6: Clones and Functions (2 weeks)

In this unit, students explore how to use clones and functions to create more efficient and dynamic programs.

Objectives / Topics Covered	● Explore how clones affect program behavior. ● Use functions with boolean inputs to trigger actions based on conditions.
Lessons	**Introduction to Clones** ● Create an animation using clones and explore how clone behavior affects the program's outcome. **Scout's Quest: Functions with Boolean Inputs** ● Build a function that uses a boolean input to perform different actions, such as checking if a password is correct.

Unit 7: Culmination Projects (4 weeks)

In this unit, students apply their understanding of conditionals, variables, functions, and events to design and build interactive games.

Objectives / Topics Covered	● Apply key programming concepts including conditionals, variables, and events. ● Demonstrate mastery of coding skills through creative problem-solving and game design.
Lessons	**Click-a-Mole (2 part lesson)** ● Create an interactive Whack-a-Mole style game using conditionals, variables, and events to demonstrate mastery of core programming concepts. **Designing Solutions for Accessibility (2 part lesson)** ● Explore how to apply design thinking to create digital tools and experiences that are accessible to everyone. ● *Standard Met: DLCS25.4.17*

Unit 8: Computing & Society (5 weeks)

In this unit, students explore how different computing technologies impact the world around them and gain an understanding of how to use digital tools responsibly.

Objectives / Topics Covered	● Understand how technology impacts society. ● Learn strategies for staying safe online.
Lessons	**Developing Keyboarding Skills (Ongoing typing program)** ● Use proper finger placement to practice typing on a keyboard. ● *Standard Met: DLCS25.4.26* **Impacts of Computing: Exploration** ● Explore how computing affects individuals, society, and the world around us. ● *Standard Met: DLCS25.4.15* **Standing Up to Cyberbullying** ● Recognize different types of online hurtful behavior and describe ways to respond. ● *Standard Met: DLCS25.4.14* **Screen Time: Protecting Relationships** ● Create a healthy screen time plan. ● *Standard Met: DLCS25.4.15* **Managing Digital Footprints** ● Explain how online actions create permanent digital footprints. ● *Standards Met: DLCS25.4.20, DLCS25.4.22* **Exploring Digital Etiquette and Communication** ● Demonstrate proper etiquette when communicating online. ● *Standard Met: DLCS25.4.21*

Unit 9: Systems & Security (4 weeks)

In this unit, students will learn how to stay safe online and explore how networks connect devices.

Objectives / Topics Covered	● Recognize common digital threats. ● Understand how messages move between devices using a network. ● Manage files on a device.
Lessons	**Online Risks & Protection** ● Demonstrate how to stay safe online by practicing secure habits. ● *Standards Met: DLCS25.4.11, DLCS25.4.12* **Exploring Cryptography** ● Learn basic cryptography to solve multiple ciphers. ● *Standard Met: DLCS25.4.2* **File Management and Data in Action** ● Explain how data size varies and explore different ways digital files are stored. ● *Standards Met: DLCS25.4.9, DLCS25.4.24* **Networks, Packets, and the Internet** ● Model how information travels through the Internet, including packet transfer and reassembly, and create a secure communication method. ● *Standard Met: DLCS25.4.10*

Unit 10: Research & Data (2 weeks)

In this unit, students will learn how to search for trustworthy information online and communicate what they learn through interactive programs.

Objectives / Topics Covered	● Follow laws when researching online. ● Analyze data for accuracy and to draw conclusions.
Lessons	**Give Credit When You Use It** ● Research information online to answer questions and give credit to sources properly. ● *Standards Met: DLCS25.4.18, DLCS25.4.19* **Data Investigators** ● Evaluate data for reliability and analyze it to draw conclusions. ● *Standard Met: DLCS25.4.7*

Unit 11: Artificial Intelligence (3 weeks)

In this unit, students will learn how to use AI tools responsibly and effectively.

Objectives / Topics Covered	● Understand how machines learn information and make predictions. ● Describe how emerging technologies can be used in daily life. ● Write AI prompts.
Lessons	**How Machines Learn** ● Explain the different machine learning approaches. ● *Standard Met: DLCS25.4.8* **Ethical and Responsible Use of Generative AI** ● Describe the pros and cons of generative AI and complete a class Code of Conduct to follow when using AI. ● *Standard Met: DLCS25.4.16* **Creating AI Prompts** ● Create, test, and improve AI prompts. ● *Standard Met: DLCS25.4.25*

4th 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.
Design-Your-Own-Lesson Templates	Empower your students to explore and express their knowledge creatively with our versatile graphic organizer templates. Designed with adaptability and ease of use in mind, these interactive tools transform any subject into an engaging, hands-on learning experience.
These resources and more are found on the **CodeHop Resources Page**.	