Arkansas Computer Science: 4th Grade Course Syllabus

One Year for Elementary School, 36 Hours

Course Overview and Goals

The **Arkansas 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 in bold parentheses (below) are required to fully meet state computer science standards.

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 5 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/AR_4/overview



A clickable PDF can be found at https://codehs.com/AR-K-4Roadmaps

Course Breakdown

Optional Review

In this optional unit, students review logging in to the Playground and use image editing tools to create and program sea creatures.

Objectives / Topics Covered	● Log in and navigate the Playground ● Use image editing tools to create sprites
Lessons	**Welcome to CodeHop!** ● Learn how to log in and explore the Playground to prepare for future lessons. **Drawing Tools: Sea Creatures** ● Use image editing tools to create and program deep sea creatures.

Unit 1: Getting Started (2 weeks)

In this unit, students learn key computer science vocabulary, create a simple program, and apply computational thinking to design a school.

Objectives / Topics Covered	● Understand and use key computer science vocabulary ● Create a simple program ● Apply computational thinking skills
Lessons	**Introduction to Computer Science** ● Define key computer science vocabulary and create a simple program. **Computational Thinking: Design a School (CSK4.4.2.1.3, CSK4.4.2.1.4)** ● Break down tasks, identify patterns, and organize ideas to design a school. **Getting Started Quiz (5 questions)**

Unit 2: Sequences & Events (3 weeks)

In this unit, students compare and refine algorithms and create a choose-your-own-path game about culture.

Objectives / Topics Covered	● Compare and refine algorithms for efficiency ● Create an interactive choose-your-own-path game
Lessons	**Compare and Refine Algorithms (CSK4.4.2.1.2)** ● Compare multiple algorithms for the same task to find the most efficient one. **Choose Your Own Path: Elements of Culture (2 part lesson | CSK4.4.2.1.3, CSK4.4.2.2.1)** ● Create a choose-your-own-path game that explores elements of culture. **Sequences & Events Quiz (5 questions)**

Unit 3: Loops (3 weeks)

In this unit, students use different types of loops to build games and turtle graphics and decompose programs to debug them.

Objectives / Topics Covered	● Use different types of loops ● Decompose a program to debug it ● Create looping turtle graphics

Lessons	**Loops: Catch the Ball** ● Use two types of loops to create a simple catching game. **Debugging: Mazes (CSK4.4.2.1.3, CSK4.4.2.2.2)** ● Decompose a maze program to find and fix bugs. **Creating Turtle Graphics (CSK4.4.2.1.1)** ● Use the pen tool and loops to create turtle graphics. **Loops Quiz (5 questions)**

Unit 4: Conditionals & Operators (3 weeks)

In this unit, students use conditionals to control program behavior and learn to give credit when creating or remixing programs.

Objectives / Topics Covered	● Use if/then and if/then/else conditionals ● Give appropriate attribution when remixing programs
Lessons	**Conditionals: Underwater Exploration (CSK4.4.2.2.1, CSK4.4.2.3.1)** ● Create an underwater program that uses conditionals. **Giving Credit through Attributions (CSK4.4.1.3.2)** ● Give appropriate attribution when creating or remixing programs online. **Complex Conditionals: Chase the Star (CSK4.4.2.2.1, CSK4.4.2.3.2)** ● Use “if/then/else” conditionals to program a chase game. **Conditionals & Operators Quiz (5 questions)**

Unit 5: Variables & Lists (2 weeks)

In this unit, students use variables to control program behavior and lists to store and display data.

Objectives / Topics Covered	● Use variables to control pitch and speed ● Use lists to store data in a game
Lessons	**Variables in Dance** ● Use variables to control pitch and dance speed in a program. **Lists: Spelling Bee** ● Use lists to create a spelling bee game. **Variables & Lists Quiz (5 questions)**

Unit 6: Culmination Project (2 weeks)

In this unit, students use the design thinking process to redesign a game so it is more accessible for diverse users.

Objectives / Topics Covered	● Apply the design thinking process ● Improve accessibility and usability for diverse users
Lessons	**Designing Solutions for Accessibility (2 part lesson)** ● Use design thinking to redesign a game so it is accessible and usable for everyone.

Unit 7: Computing Systems (2 weeks)

In this unit, students identify the parts of a computing system and model how data travels between devices on a network.

Objectives / Topics Covered	● Identify parts of a computing system ● Identify simple hardware and software problems ● Model how data moves across a network
Lessons	**Exploring Computing Systems (CSK4.4.4.1.1, CSK4.4.4.1.3, CSK4.4.4.1.4)** ● Identify parts of a computing system and simple hardware and software problems. **Modeling Network Connections (CSK4.4.4.3.2, CSK4.4.4.3.3)** ● Create a program that models how data travels from one device to another. **Computing Systems Quiz (5 questions)**

Unit 8: Safety & Responsibility (8 weeks)

In this unit, students learn to respond to cyberbullying, protect their information, manage their digital footprints, communicate respectfully, and build healthy screen-time habits.

Objectives / Topics Covered	● Recognize and respond to cyberbullying ● Practice secure habits to protect information ● Manage digital footprints responsibly ● Create a healthy screen-time plan
Lessons	**Standing Up to Cyberbullying (CSK4.4.1.1.1, CSK4.4.1.1.2)** ● Recognize online hurtful behavior, including cyberbullying, and describe ways to respond. **Online Risks & Protection (CSK4.4.1.2.1, CSK4.4.1.2.3)** ● Practice secure habits and explore tools that protect personal information. **Cybersecurity & Privacy (2 part lesson | CSK4.4.1.2.4)** ● Create an animated program that solves a real-world cybersecurity issue. **Digital Responsibility: Owning Your Choices (CSK4.4.1.2.1, CSK4.4.1.2.3, CSK4.4.4.1.2)** ● Identify online dangers and practice making responsible choices to stay safe. **Managing Digital Footprints (CSK4.4.1.1.3)** ● Explain how online actions create permanent digital footprints and how to manage them. **Digital Etiquette and Teamwork (CSK4.4.1.1.4, CSK4.4.1.2.2)** ● Demonstrate proper digital etiquette when communicating in an online community. **Screen Time: Protecting Relationships (CSK4.4.1.3.1)** ● Explain how screen time affects relationships and create a healthy screen-time plan. **Safety & Responsibility Quiz (5 questions)**

Unit 9: Data & Analysis (9 weeks)

In this unit, students evaluate data and sources, research and present information, follow the inquiry process to graph results, and learn how data is stored.

Objectives / Topics Covered	● Evaluate data and sources for reliability ● Research and present information using productivity software ● Display investigation results in a line graph ● Explain how digital data is stored
Lessons	**Data Investigators (CSK4.4.3.1.1, CSK4.4.3.1.3, CSK4.4.3.2.1, CSK4.4.3.2.3)** ● Evaluate data for reliability and analyze it to draw conclusions and make predictions. **Use and Search the Right Way (CSK4.4.1.2.4, CSK4.4.1.3.2, CSK4.4.1.3.3)** ● Search for information online and give proper credit to sources.

	Research: Informational Programs (2 part lesson | CSK4.4.4.2.2) ● Research healthy sleep habits and create a public service announcement program. **Persuasive Productivity Software Project (2 part lesson | CSK4.4.3.3.1, CSK4.4.3.3.2, CSK4.4.4.2.1)** ● Use word processing, spreadsheet, and presentation software to persuade an audience. **Inquiry Project: Line Graph (2 part lesson | CSK4.4.3.1.2, CSK4.4.3.2.1, CSK4.4.3.2.2, CSK4.4.3.3.1)** ● Follow the inquiry process and modify a program to display results as a line graph. **File Management and Data in Action (CSK4.4.4.2.3)** ● Explain how data size varies and explore different ways digital files are stored. **Data & Analysis Quiz (5 questions)**

Unit 10: Artificial Intelligence (2 weeks)

In this unit, students explore how machines learn to make predictions and how emerging technologies are designed and used.

Objectives / Topics Covered	● Explain different machine learning approaches ● Model how AI is trained to make predictions ● Describe how emerging technologies are used
Lessons	**How Machines Learn** ● Explain machine learning approaches and modify a program to model how AI makes predictions. **Creating Smart Machines (CSK4.4.4.3.1)** ● Describe how emerging technologies are used and why people design new technology. **Artificial Intelligence Quiz (5 questions)**

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**.	