

## CompuScholar, Inc.

### Alignment to Alabama Digital Literacy and Computer Science Standards

9th - 12th grades

#### Alabama Course Details:

<b>Course Title:</b>	Digital Literacy and Computer Science
<b>Grade Level:</b>	9th - 12th grades
<b>Standards Link:</b>	<a href="#">2025 Alabama Digital Literacy and Computer Science (PDF)</a>

#### CompuScholar Course Details:

<b>Course Title:</b>	Computer Science Foundations
<b>Course ISBN:</b>	978-0-9887070-0-9
<b>Course Year:</b>	2026

### Course Description

9th-12th content for Alabama Digital Literacy and Computer Science (DLCS) is organized into five areas of focused study. CompuScholar's "Computer Science Foundations" course covers these topics as described below.

### Course Standards - 9th - 12th Grade

**Note 1:** Citation(s) listed may represent a subset of the instances where objectives are met throughout the course.

**Note 2:** Citation(s) for a "Lesson" refer to the "Lesson Text" elements and associated "Activities" within the course, unless otherwise noted. The "Instructional Video" components are supplements designed to introduce or reinforce the main lesson concepts and are not cited for alignment purposes.

**Note 3:** "Supplemental" or "Suppl." citation(s) refer to Supplemental chapters included at the end of the course.

Computational Thinking	CITATION(S)
<b>Algorithms, Abstraction, and Decomposition</b>	
1. Compare and contrast a generalized algorithm in pseudocode and its concrete implementation in a programming language.	Chapter 15, Lessons 2, 3
2. Translate pseudocode, flowcharts, or other planning tools into multiple programming languages.	Chapter 14, Lesson 2 / Activities 1, 2 Chapter 15, Lessons 1, 2, 4
3. Explain the characteristics of algorithms, including speed, accuracy, and storage requirements.	Chapter 16, Lessons 1, 2
4. Model and adapt classic algorithms, including sorting and searching, to solve computational problems.	Chapter 9, Lesson 4 Chapter 15, Lesson 3 Supplemental Chapter 3, Lesson 6
5. Decompose problems into component parts, extract key information, and model levels of abstraction in complex systems.	Chapter 4, Lesson 1 Chapter 9, Lesson 1 Chapter 12, Lessons 1, 4

6. Compare different data compression algorithms by analyzing their main features, including their compression speed and whether they preserve data exactly (lossless) or reduce data quality for higher compression (lossy).	Chapter 17, Lesson 4
7. Create software solutions using libraries and application programming interfaces (APIs) that demonstrate code reuse.	Chapter 10, Lessons 1, 2, 3 Chapter 14, Activity 1 Supplemental Chapter 2, Lesson 2
8. Compare and contrast the major categories of machine learning, including supervised, unsupervised, and reinforcement learning. [AI]	Supplemental Chapter 4, Lesson 1
<b>Programming</b>	
9. Compare and contrast fundamental data structures and their uses. Examples: strings, lists, arrays, dictionaries, stacks, queues	Chapter 4, Lesson 4 Chapter 9, Lesson 1 Supplemental Chapter 3, Lesson 4
10. Develop and use a series of test cases to verify that a program performs according to its design specifications.	Chapter 14, Lesson 4 / Activity 3
11. Utilize an iterative and incremental software design process, including learning from mistakes, to improve a program.	Chapter 14, Lessons 2, 4 Chapter 14, Activity 3
12. Improve existing code by restructuring (refactoring) it to enhance readability and/or increase efficiency without changing its overall behavior.	Chapter 12, Lesson 4
13. Select and utilize effective debugging techniques to correct problems in software.	Chapter 7, Lessons 2, 3
14. Create a complete program to solve a problem or explore personal interests, using a text-based programming language.	Chapters 13 and 14 (All Activities)
15. Design and implement a program that processes user input, applies relational and logical operators within conditional logic, maintains program state, and produces appropriate responses. Examples: chatbot, tic-tac-toe	Chapter 5, Lesson 2 / Activity (input) Chapter 6, Lessons 3, 4 / Activity (logic) Chapter 9, Lesson 1 / Activity (state) Chapters 13 and 14 (All Activities)

<b>Data Science</b>	<b>CITATION(S)</b>
<b>Data Collection and Representation</b>	
16. Create interactive data visualizations to help others understand real-world phenomena. [AI]	Chapter 17, Lesson 3 / Activity
17. Verify the validity of a dataset by identifying missing, out-of-range, inconsistent, or invalid data and distinguishing these from statistical outliers using basic measures such as range, mean, or standard deviation.	Chapter 17, Lesson 2 Supplemental Chapter 3, Lesson 5
<b>Data Analysis</b>	
18. Correct or remove entries containing missing, out-of-range, inconsistent, or invalid data from a dataset to prepare it for analysis.	Chapter 17, Lesson 2
19. Utilize data analysis tools and statistical methods on a dataset to discover useful information, identify patterns, or make an informed decision.	Chapter 17, Lessons 1, 3

<b>Modeling and Simulation</b>	
20. Create and utilize models and simulations to help formulate, test, and refine a hypothesis.	Chapter 16, Lesson 3 / Activity Chapter 17, Lesson 3 / Activity
21. Update an existing model to address flaws and improve precision.	Chapter 16, Lesson 3 Chapter 16 Activity

<b>Computing Systems</b>	<b>CITATION(S)</b>
<b>Networks and Internet</b>	
22. Analyze how network infrastructure impacts the speed, reliability, and scalability of services.	Chapter 2, Lessons 3, 4
23. Explain how security protocols in networked systems protect or expose data and assess the risks associated with IoT devices and cloud services.	Chapter 2, Lessons 1, 3 Chapter 20, Lessons 1, 2
<b>Cybersecurity</b>	
24. Explain the tradeoffs when selecting and implementing cybersecurity recommendations, balancing cost, performance, usability, and security. Examples: multi-factor authentication, password requirements, location-based requirements	Chapter 20, Lesson 2
25. Summarize the mechanisms and purposes of various tracking technologies and identify strategies to manage them.	Chapter 20, Lessons 1, 3
26. Investigate the purpose of and relationship among various computer security measures. Examples: firewalls, authentication, encryption	Chapter 20, Lesson 2
27. Create a personal cybersecurity plan incorporating the CIA Triad (confidentiality, integrity, and availability) to safeguard sensitive information and ensure its trustworthiness and accessibility.	Chapter 20, Lesson 2
28. Investigate the motivations behind hacking and examine the associated ethical considerations. Examples: white, black, and gray hat hacking	Chapter 20, Lessons 2, 3 Chapter 20 Activity
29. Appraise the trustworthiness of new or unfamiliar resources in order to make safe choices when downloading, installing, and using software.	Chapter 20, Lesson 1
<b>Hardware and Software</b>	
30. Compare alternative computing architectures, including cluster and quantum computing, to classical computing systems.	Chapter 1, Lesson 1 (quantum) Chapter 2, Lesson 4 (clustered) Supplemental Chapter 3, Lesson 3
31. Explain the interactions between application software, operating systems, drivers, and hardware.	Chapter 1, Lesson 3
32. Compare and contrast the common metadata elements of various file types.	Chapter 27, Lesson 1
33. Develop and implement troubleshooting strategies to identify and correct problems with computing devices.	Chapter 7, Lessons 2, 3 Supplemental Chapter 3, Lesson 1

<b>Impact of Computing</b>	<b>CITATION(S)</b>
<b>Career Paths</b>	
34. Research and explain the impact of computing technology on career pathways across different industries and career fields.	Chapter 29, Lessons 1, 4 Chapter 29 Activity
35. Research and share information regarding current AI applications in various career fields. [AI]Examples: healthcare, transportation, entertainment	Supplemental Chapter 4, Lesson 2
<b>Ethics</b>	
36. Analyze the implications of data privacy and consent for making informed decisions about personal data security.	Chapter 19, Lesson 1 Chapter 20, Lessons 1, 2, 3
37. Identify and evaluate the consequences of technology-related laws and policies, including those addressing privacy, accessibility, and intellectual property.	Chapter 19, Lessons 2, 3
<b>Society</b>	
38. Analyze the ethical issues related to AI technologies and evaluate their societal and ecological impacts. [AI]	Supplemental Chapter 4, Lessons 2, 3
<b>Emerging Technology</b>	
39. Predict the transformative effects of hypothetical future technologies. [AI]	Chapter 19, Lesson 1 Supplemental Chapter 3, Lesson 3 Supplemental Chapter 4, Lesson 3
<b>Accessibility</b>	
40. Follow Americans with Disabilities Act (ADA) standards to design digital artifacts that reduce barriers caused by the digital divide, disability, or bias.	Chapter 16, Lesson 3 Chapter 18, Lesson 1 Chapter 19, Lesson 2 Chapter 25, Lesson 2 / Activity

<b>Digital Proficiency</b>	<b>CITATION(S)</b>
<b>Information Literacy</b>	
41. Research and report potential dangers and unintended consequences of over-reliance on AI tools. [AI]Examples: misinformation, disinformation, implicit bias	Supplemental Chapter 4, Lesson 3
<b>Digital Life</b>	
42. Explain how systems learn user preferences and behaviors to deliver personalized content and targeted advertisements. [AI]	Chapter 20, Lesson 1
43. Investigate the mental health risks associated with excessive technology use, including social isolation, anxiety, and depression, and develop strategies to mitigate them.	Chapter 18, Lesson 2 Supplemental Chapter 4, Lesson 3
<b>Digital Tools</b>	
44. Evaluate the usability of software applications for broad audiences by considering feedback from real-world users.	Chapter 14, Lesson 4 Chapter 14, Activity 3
45. Identify a problem best solved through human-machine collaboration, decomposing it into tasks suited for each.	Supplemental Chapter 4, Lesson 2