Alabama CS Standards Alignment with CodeX Curriculum

5th grade	Unit 1	Unit 2	Unit 3
Computational Thinker			
5.AB.1 Construct a complex system of numbers or letters to represent information.			
5.AL.2 Create an algorithm to solve a problem while detecting and debugging logical errors within the algorithm.			
5.AL.3 Create an algorithm that is defined by simple pseudocode.			
5.AL.4 Create a simple pseudocode.			
5.AL.5 Develop and recommend solutions to a given problem and explain the process to an audience.			
5.PD.6 Create a working program in a block-based visual programming environment using arithmetic operators, conditionals, and repetition in programs.			
5.PD.7 Identify variables.			
5.PD.8 Demonstrate that programs require known starting values that may need to be updated appropriately during the execution of programs.			
Citizen of a Digital Culture			
5.SPS.9 Explain the proper use and operation of security technologies.			
5.LEP.10 Identify appropriate and inappropriate uses of communication technology and discuss the permanence of actions in the digital world.			
5.LEP.11 Explain that laws and tools exist to help ensure that people of varying abilities can access electronic and information technology.			
5.DI.12 Explain the different forms of web advertising and why websites, digital resources, and artifacts may include advertisements that may collect personal information.			
5.IC.13 Share knowledge of resources in the community that can give people access to technology.			
5.IC.14 Analyze the impact of social media on individuals, families, and society.			
5.IC.15 Explore and predict how advances in computing technologies affect job opportunities and/or processes now and in the future.			
Global Collaborator			
5.C.16 Use advanced features of digital tools and media-rich resources to communicate key ideas and details in a way that informs, persuades, and/or entertains.			
5.C.17 Publish organized information in different ways to make it more useful or relevant.			
5.C.18 Type 25 words per minute with 95% accuracy using appropriate keyboarding techniques.			
5.CR.19 Conduct advanced keyword searches to produce valid, appropriate results and evaluate results for accuracy, relevance, and appropriateness.			
5.SI. 20 Collaborate locally and globally using online digital tools under teacher supervision.			
Computing Analyst			
5.DA.21 Manipulate data to answer a question using a variety of computing methods and tools to collect, organize, graph, analyze, and publish the resulting information.			
5.SY.22 Identify computing services that may be initially turned on by default.			
5.SY.23 Identify the key components of a network.			
5.SY.24 Describe the need for authentication of users and devices as it relates to access permissions, privacy, and security.			
5.MS.25 Analyze the concepts, features, and behaviors illustrated by a simulation.			
5.MS.26 Connect data from a simulation to real-life events.			
Innovative Designer			
5.HCP.27 Define social engineering and discuss possible defenses.			
5.HCP.28 Develop, test, and refine prototypes as part of a cyclical design process to solve a complex problem.			

Alabama CS Standards Alignment with CodeX Curriculum

6th grade	Unit 1	Unit 2	Unit 3
Computational Thinker			
6.AB.1 Remove background details from an everyday process to highlight essential properties.			
6.AB.2 Define a process as a function.			
6.AL.3 Create pseudocode that uses conditionals			
6.AL.4 Differentiate between flowcharts and pseudocode.			
6.AL.5 Identify algorithms that make use of sequencing, selection or iteration.			
6.PD.6 Identify steps in developing solutions to complex problems using computational thinking.			
6.PD.7 Describe how automation works to increase efficiency.			
6.PD.8 Create a program that initializes a variable.			
Citizen of a Digital Culture			
6.SPS.9 Differentiate between a secure and a non-secure website including how they affect personal data			
6.LEP.10 . Describe the causes and effects of illegal use of intellectual property as it relates to print and digital media, considering copyright, fair use, licensing, sharing, and attribution.			
6.LEP.11 Differentiate between appropriate and inappropriate digital content and the use of that content.			
6.DI.12 Define digital permanence.			
6.DI.13 Define personal privacy, digital footprint, and open communication.			
6.IC.14 Discuss digital globalization and Internet censorship.			
6.IC.15 Identify emerging technologies in computing.			
Global Collaborator			
6.CC.16 Communicate and/or publish collaboratively to inform others from a variety of backgrounds and cultures about issues and problems.			
6.DT.17 Type 30 words per minute with 95% accuracy using appropriate keyboarding techniques.			
6.SI.18 Define censorship.			
Computing Analyst			
6.DA.19 Track data change from a variety of sources.			
6.DA.20 Identify data transferring protocols, visualization, and the purpose of data and methods of storage.			
6.DA.21 Identify varying data structures/systems and methods of classification, including decimal and binary.			
6.DA.22 Summarize the purpose of the American Standard Code for Information Interchange (ASCII).			
6.SY.23 Discuss how digital devices may be used to collect, analyze, and present information			
6.SY.24 Compare and contrast types of networks			
6.SY.25 Differentiate between secure and non-secure systems.			
6.MS.26 Explain why professionals may use models as logical representations of physical, mathematical, or logical systems or processes.			
6.MS.27 Explain how simulations serve to implement models.			
Innovative Designer			
6.HCP.28 Define assistive technologies and state reasons they may be needed.			
6.HCP.29 Define artificial intelligence and identify examples of artificial intelligence in the community.			
6.DE.30 Discuss and apply the components of the problem-solving process.			

Alabama CS Standards Alignment with CodeX Curriculum

7th grade	Unit 1	Unit 2	Unit 3
Computational Thinker			
7.AB.1 Create a function to simplify a task			
7.AL.2 Create complex pseudocode using conditionals and Boolean statements.			
7.AL.3 Create algorithms that demonstrate sequencing, selection or iteration.			
7.AL.4 Design a complex algorithm that contains sequencing, selection or iteration.			
7.PD.5 Solve a complex problem using computational thinking.			
7.PD.6 Create and organize algorithms in order to automate a process efficiently.			
7.PD.7 Create a program that updates the value of a variable in the program.			
7.PD.8 Formulate a narrative for each step of a process and its intended result, given pseudocode or code.			
Citizen of a Digital Culture			
7.SPS.9 Identify common methods of securing data.			
7.LEP.10 Explain social engineering, including countermeasures, and its impact on a digital society			
7.LEP.11 Demonstrate positive, safe, legal, and ethical habits when creating and sharing digital content and identify the consequences of failing to act responsibly.			
7.DI.12 Discuss the impact of data permanence on digital identity including best practices to protect personal digital footprint.			
7.IC.13 Compare and contrast information available locally and globally.			
7.IC.14 Discuss current events related to emerging technologies in computing and the effects such events have on individuals and the global society.			
7.IC.15 Discuss unique perspectives and needs of a global culture when developing computational artifacts, including options for accessibility for all users.			
Global Collaborator			
7.CC.16 Construct content designed for specific audiences through an appropriate medium.			
7.DT.17 Publish content to be available for external feedback.			
7.DT.18 Type 35 words per minute with 95% accuracy using appropriate keyboarding techniques.			
7.SI.19 Discuss the benefits and limitations of censorship.			
7.DA.20 Evaluate the validity and accuracy of a data set.			
Computing Analyst			
7.DA.21 Compare common transfer protocols.			
7.DA.22 Compare data storage structures.			
7.SY.23 Demonstrate the use of a variety of digital devices individually and collaboratively to collect, analyze, and present information for content-related problems.			
7.SY.24 Diagram a network given a specific setup or need.			
7.SY.25 List common methods of system cybersecurity.			
7.MS.26 Categorize models based on the most appropriate representation of various systems.			
7.MS.27 Identify data needed to create a model or simulation of a given event.			
Innovative Designer			
7.HCP.28 Classify types of assistive technologies.			
7.HCP.29 Compare and contrast human intelligence and artificial intelligence.			
7.DE.30 Apply the problem-solving process to solve real-world problems.			

Alabama CS Standards Alignment with CodeX Curriculum

8th grade	Unit 1	Unit 2	Unit 3
Computational Thinker			
8.AB.1 Design a function using a programming language that demonstrates abstraction.			
8.AB.2 Explain how abstraction is used in a given function.			
8.AL.3 . Create an algorithm using a programming language that includes the use of sequencing, selections, or iterations.			
8.AL.4 Create a function to simplify a task.			
8.PD.5 Discuss the efficiency of an algorithm or technology used to solve complex problems			
8.PD.6 Describe how algorithmic processes and automation increase efficiency.			
8.PD.7 Create a program that includes selection, iteration, or abstraction, and initializes, and updates, at least two variables.			
Citizen of a Digital Culture			
8.SPS.8 Compare and contrast common methods of securing data.			
8.SPS.9 Secure a file or other data.			
8.LEP.10 Analyze different modes of social engineering and their effectiveness.			
8.LEP.11 Advocate for positive, safe, legal, and ethical habits when creating and sharing digital content			
8.DI.12 Cite evidence of the positive and negative effects of data permanence on personal and professional digital identity.			
8.IC.13 Evaluate the impact of digital globalization on public perception and ways Internet censorship can affect free and equitable access to information.			
8.IC.14 Analyze current events related to computing and their effects on education, the workplace, individuals, communities, and global society.			
8.IC.15 Critique computational artifacts, including options for accessibility for all users, with respect to the needs of a global culture.			
Global Collaborator			
8.CC.16 Present content designed for specific audiences through an appropriate medium.			
8.DT.17 Communicate and publish individually or collaboratively to persuade peers, experts, or community about issues and problems.			
8.DT.18 Type 40 words per minute with 95% accuracy using appropriate keyboarding techniques.			
8.SI.19 Critique the impacts of censorship as it impacts global society.			
8.DA.20 Examine an artifact that demonstrates bias through distorting, exaggerating, or misrepresenting data and redesign it using factual, relevant, unbiased content to more accurately reflect the truth.			
Computing Analyst			
8.DA.21 Differentiate types of data storage and apply most efficient structure.			
8.DA.22 Encrypt and decrypt various data.			
8.SY.23 Design a digital artifact to propose a solution for a content-related problem.			
8.SY.24 Compare and contrast common methods of cybersecurity.			
8.SY.25 Create a model that represents a system.			
8.MS.26 Create a simulation that tests a specific model.			
Innovative Designer			
8.HCP.27 Analyze assistive technologies and how they improve the quality of life for users.			
8.HCP.28 Develop a logical argument for and against artificial intelligence.			
8.DE.29 Create an artifact to solve a problem using ideation and iteration in the problem-solving			

Alabama CS Standards Alignment with CodeX Curriculum

High School	Unit 1	Unit 2	Unit 3
Computational Thinker			
HS.AB.1 Decompose problems into component parts, extract key information, and develop descriptive models to understand the levels of abstractions in complex systems.			
HS.AB.2 Explain how computing systems are often integrated with other systems and embedded in ways that may not be apparent to the user.			
HS.AL.3 Differentiate between a generalized expression of an algorithm in pseudocode and its concrete implementation in a programming language.			
HS.AL.3a Explain that some algorithms do not lead to exact solutions in a reasonable amount of time and thus approximations are acceptable.			
HS.AL.3b Compare and contrast the difference between specific control structures such as sequential statements, conditional, iteration, and explain the benefits and drawbacks of choices			
HS.AL.3c Distinguish when a problem solution requires decisions to be made among alternatives, such as selection constructs, or when a solution needs to be iteratively processed to arrive at a result, such as iterative "loop" constructs or recursion.			
HS.AL.3d Evaluate and select algorithms based on performance, reusability, and ease of implementation.			
HS.AL.3e Explain how more than one algorithm may solve the same problem and yet be characterized with different priorities.			
HS.AL.4 Use and adapt classic algorithms to solve computational problems.			
HS.PD.5 Design and iteratively develop computational artifacts for practical intent, personal expression, or to address a societal issue by using current events.			
HS.PD.6 Decompose problems into smaller components through systematic analysis, using constructs such as procedures, modules, and/or objects, with parameters, and which return a result.			
HS.PD.7 Compare and contrast fundamental data structures and their uses.			
HS.PD.8 Demonstrate code reuse by creating programming solutions using libraries and Application Programming Interfaces.			
HS.PD.9 Demonstrate the ability to verify the correctness of a program.			
HS.PD.9a Develop and use a series of test cases to verify that a program performs according to its design specifications			
HS.PD.9b Collaborate in a code review process to identify correctness, efficiency, scalability and readability of program code.			
HS.PD.10 Resolve or debug errors encountered during testing using iterative design process.			
Citizen of a Digital Culture			
HS.SPS.11 Model and demonstrate behaviors that are safe, legal, and ethical while living, learning, and working in an interconnected digital world.			
HS.SPS.11a Recognize user tracking methods and hazards.			
HS.SPS.11b Understand how to apply techniques to mitigate effects of user tracking methods.			
HS.SPS.11c Understand the ramifications of end-user license agreements and terms of service associated with granting rights to personal data and media to other entities.			
HS.SPS.11d Explain the relationship between online privacy and personal security.			
HS.SPS.11e Identify physical, legal, and ethical consequences of inappropriate digital behaviors.			
HS.SPS.11f Explain strategies to lessen the impact of negative digital behaviors and assess when to apply them.			
HS.SPS.12 Describe how sensitive data can be affected by malware and other attacks.			
HS.SPS.13 Compare various security measures of a computer system.			
HS.SPS.14 Compare ways to protect devices, software, and data.			
HS.LEB.15 Explain the necessity for the school's Acceptable Use Policy.			
HS.LEB.16 Identify laws regarding the use of technology and their consequences and implications.			
HS.LEB.17 Discuss the ethical ramifications of malicious hacking and its impact on society.			
HS.LEB.18 Explain the beneficial and harmful effects that intellectual property laws can have on innovation.			
HS.DI.19 Prove that digital identity is a reflection of persistent, publicly available artifacts.			
HS.DI.20 Evaluate strategies to manage digital identity and reputation with awareness of the permanent impact of actions in a digital world.			
HS.IC.21 Explain how technology facilitates the disruption of traditional institutions and services.			
HS.IC.22 Research the impact of computing technology on possible career pathways.			
HS.SY.23 Debate the positive and negative effects of computing innovations in personal, ethical, social, economic, and cultural spheres.			
Global Collaborator			
HS.CC.24 Compare and contrast Internet publishing platforms, including suitability for media types, target audience, and feedback mechanism.			
HS.DT.25 Utilize a variety of digital tools to create digital artifacts across content areas.			
HS.CR.26 Use collaborative technologies to work with others including peers, experts, or community members to examine local, national, and global issues and problems from multiple viewpoints.			
HS.SI.27 Apply tools and methods for collaboration on a project to increase connectivity among people in different cultures and career fields.			
Computing Analyst			
HS.DA.28 Develop a model that reflects the methods, procedures and concepts used by computing devices in translating digital bits as real-world phenomena, such as print characters, sound, images, and video.			
HS.DA.29 Summarize the role of compression and encryption in modifying the structure of digital artifacts and the varieties of information carried in the metadata of these artifacts.			
HS.DA.30 Evaluate the tradeoffs involved in choosing methods for the organization of data elements and the location of data storage, including the advantages and disadvantages of networked computing.			
HS.DA.31 Create interactive data visualizations using software tools to help others understand real-world phenomena.			
HS.DA.32 Use data analysis tools and techniques to identify patterns in data representing complex systems.			
HS.SY.33 Evaluate the scalability and reliability of networks by describing the relationship between routers, switches, servers, topology, packets, or addressing, as well as the issues that impact network functionality			
HS.SY.33a Explain the purpose of Internet Protocol addresses and how domain names are resolved to IP addresses through a Domain Name System server.			
HS.SY.33b Understand the need for networking protocols and examples of common protocols.			
HS.SY.34 Categorize the roles of operating system software.			
HS.SY.35 Appraise the role of artificial intelligence in guiding software and physical systems.			
HS.SY.36 . Explain the tradeoffs when selecting and implementing cybersecurity recommendations.			
HS.MS.37 Evaluate the ability of models and simulations to test and support the refinement of hypotheses.			
HS.MS.37a Create and utilize models and simulations to help formulate, test, and refine a hypothesis.			
HS.MS.37b Form a model of a hypothesis, testing the hypothesis by the collection and analysis of data generated by simulations.			
HS.MS.37c Explore situations where a flawed model provided an incorrect answer.			
Innovative Designer			
HS.HCP.38 Systematically design and develop programs for broad audiences by incorporating feedback from users.			
HS.HCP.39 Identify a problem that cannot be solved by either humans or machines alone and discuss a solution for it by decomposing the task into sub-problems suited for a human or machine to accomplish.			
HS.DE.40 Use an iterative design process, including learning from mistakes, to gain a better understanding of a problem domain.			

Alabama CS Standards Alignment with CodeX Curriculum

Alabama Course of Study Digital Literacy Computer Science Standards- Recurring Standards for All Grade Levels	Unit 1	Unit 2	Unit 3
Safety, Privacy, and Security			
1. Identify, demonstrate, and apply personal safety use of digital devices.			
The safety, security, and privacy of students are essential both physically and digitally. In early grades, this equates to helping students understand the importance of protecting themselves when utilizing digital technologies and accessing resources in a responsible manner. As students mature, the specific ways in which they interact with technology will change. Utilizing passwords to access remote resources, protecting their identity online, and interacting appropriately in online environments are only a few examples of skills students need to master. As students progress to the senior high level, they should develop a greater understanding of how policies and license agreements could threaten their personal identity. Therefore, all Alabama graduates should possess the skills required to mitigate threats from individuals, as well as automated software agents.			
Legal and Ethical Behavior			
2. Recognize and demonstrate age-appropriate responsible use of digital devices and resources as outlined in school/district rules.			
It is important for students to demonstrate age-appropriate responsible use of digital devices and resources. In the early grades, students demonstrate an understanding of their district's acceptable use policy by such actions as giving another author credit for work, identifying examples of cyberbullying, and stating consequences for misuse. Upper elementary students should be able to demonstrate and apply responsible use of computers, devices, and resources. These students should also practice and share an understanding of guidelines for copyright. Students in middle grades may review the school/district rules and advocate for or against policies. As students reach secondary grades, they should be able to apply legal and ethical standards as they utilize digital tools for synthesizing information, utilizing protected content, collaborating, exploring social networks, and developing/presenting original content while adhering to local acceptable use policies.			
Impact of Computing			
3. Analyze the potential impact of computing.			
While meant to advance the processes of work, computing heavily impacts our lives. It is important for students to recognize both beneficial and harmful effects of computing. At a young age, students can be given a manual task and an automated task to determine which occurs more efficiently. Students can then begin to identify advances in computing that have improved efficiency or allowed innovation. As students mature, they can begin to identify the positive and negative impacts of computing. At the secondary level, students should identify economic, social, and cultural influences that affect computational innovation and/or limitations.			
Systems			
4. Identify and employ appropriate troubleshooting techniques used to solve computing or connectivity issues.			
Because technology is such a prevalent part of daily life, it is essential that students practice basic troubleshooting tasks at an age-appropriate level. Young students can complete simple tasks such as restarting "frozen" devices or notifying a trusted adult when they experience an unexpected response from the device. As students enter upper elementary grades, they should be able to quit a program when it is responding inappropriately and be able to diagnose simple network connection errors. In middle grades, students will be able to determine if an update is needed for a program or operating system. In secondary grades, students will apply a systematic approach to problem solving with programs and computer systems.			
Collaborative Research			
5. Locate, curate, and evaluate information from digital sources to answer research questions.			
With unlimited access to information, students need to develop the skills to process information. In early grades, teachers support collaborative research as students learn to gather data from a variety of sources and then compare their findings with those of their peers. As students progress in age, research will be less teacher-directed and more student-driven. As students mature, they will be able to identify sources as valid or invalid based on multiple factors such as publication date, location of material, author, supporting evidence, etc. The complexity of data will increase at an age-appropriate level. At the secondary level, students will work cooperatively to access digital sources from a variety of perspectives and media to synthesize and report answers for complex research questions.			
Digital Tools			
6. Produce, review, and revise authentic artifacts using appropriate digital tools.			
One goal of the DLCS COS is to produce effective communicators capable of sharing their viewpoints through digital media. With guidance from their teachers, young students will work in a variety of platforms including word processing, presentations, spreadsheets, and web applications and progress toward opening their own files and saving them either onto a computer or in the cloud. Students will then progress to selecting appropriate mediums for communicating information. Secondary students will utilize appropriate technologies for creation and management of content with due consideration of desired artifacts, content area, and prescribed and logistical limitations.			