2026 CSTA PK–12

COMPUTER SCIENCE STANDARDS

Validated Alignment of CodeAI AI Foundations

CodeAI AI Foundations

An introductory course covering AI literacy, programming, computing systems, and data science, culminating in building interactive web apps.

Learn more: https://studio.code.org/courses/ai-foundations-year1-2026

Alignment Summary

In June 2026, CSTA conducted a rigorous, independent process to validate how these curricular materials align to the 2026 CSTA PK-12 Standards. This process included reviews by multiple independent experts in the CSTA PK-12 Standards, CS teaching, and CS curriculum design. The findings are presented below in two formats: high-level tables summarizing alignment of the curriculum to each concept and/or specialty area, and more granular tables indicating alignment to each standard. Note that the data below reflects only standards that are fully aligned; in many cases, there is partial alignment not indicated below.

High School Foundation

Concept	Aligned Standards	Total Standards	Percent Aligned
Algorithms & Design	6	11	55%
Programming	5	9	55%
Data & Analysis	4	8	50%
Systems & Security	8	9	89%
Computing & Society	6	9	67%
Overall	29	46	63%

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High School Specialty

Specialty Area	Level	Aligned Standards	Total Standards	Percent Aligned
Artificial Intelligence	Specialty I	6	14	43%
Cybersecurity	Specialty I	7	15	47%
Cybersecurity	Specialty II	2	12	17%
Data Science	Specialty I	7	14	50%
Data Science	Specialty II	4	15	27%
Software Development	Specialty I	3	8	38%
Software Development	Specialty II	1	9	11%

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Alignment to High School Foundational Standards

Algorithms & Design

Identifier	Standard	Fully Aligned?
HS-ALG-PS-01	Design an algorithm using appropriate data structures to solve a problem or express an idea.	✅
HS-ALG-PS-02	Optimize the design of an algorithm using procedural abstraction and control structures.	✅
HS-ALG-PS-03	Evaluate algorithms for efficiency, correctness, and clarity, using metrics or test cases.	
HS-ALG-PS-04	Describe the differences between deterministic and probabilistic algorithms.	
HS-ALG-PS-05	Evaluate AI-generated output to assess bias, accuracy, and potential harms.	✅
HS-ALG-ML-06	Justify the selection of a type of AI algorithm to accomplish a task.	
HS-ALG-ML-07	Evaluate training data by examining its source, quality, representativeness, potential biases, and privacy implications.	✅
HS-ALG-ML-08	Develop a machine learning model for a chosen task using appropriate data and tools.	
HS-ALG-IM-09	Design a computing technology using human-centered design principles.	✅
HS-ALG-IM-10	Evaluate the ethical implications, societal impacts, and potential biases of rule-based and data-driven algorithms.	
HS-ALG-IM-11	Articulate the values embedded in the design of an algorithmic system.	✅

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Programming

Identifier	Standard	Fully Aligned?
HS-PRO-PD-12	Create a modular program that uses procedures, external libraries, or objects to improve reusability and readability.	✅
HS-PRO-PD-13	Use documentation, libraries, application programming interfaces (APIs), and other tools in program development.	
HS-PRO-PD-14	Apply appropriate attribution of intellectual property when developing a computing technology.	✅
HS-PRO-PD-15	Collaborate on a programming project using a defined workflow that includes design documentation and clear task roles.	
HS-PRO-VD-16	Create a program that uses appropriate data structures to store, access, and manipulate data.	✅
HS-PRO-RD-17	Analyze how a segment of code works, including the role of parameters, return values, and data structures.	✅
HS-PRO-RD-18	Evaluate AI-generated code for accuracy, reliability, and alignment with program requirements.	✅
HS-PRO-TR-19	Evaluate a computing technology's alignment with design specifications and responsible design values, including its correctness, effectiveness, and user experience.	
HS-PRO-TR-20	Refine a computing technology based on user feedback, testing results, and responsible design values to improve its effectiveness and impact.	

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Data & Analysis

Identifier	Standard	Fully Aligned?
HS-DAT-DC-21	Use a computational tool to generate simulated data that fits certain parameters for use in a simulation.	✅
HS-DAT-DC-22	Create a data dictionary that describes the name, type, and allowable values for each attribute and the logical relationships between variables in a dataset.	
HS-DAT-DC-23	Use a computational tool to clean and organize text-based data.	
HS-DAT-DC-24	Evaluate different approaches to verifying consistency and compliance with expected data types, values, and ranges.	✅
HS-DAT-DI-25	Create a data visualization of a multivariate dataset to answer a question or make a classification or prediction.	
HS-DAT-DI-26	Evaluate a data simulation or visualization to answer a data question, inform decision-making, and identify potential limitations.	✅
HS-DAT-IM-27	Evaluate the societal, environmental, and ethical implications of large-scale data collection and processing, including within AI applications.	✅
HS-DAT-IM-28	Debate the efficacy of a policy or regulation to ensure responsible data use.	

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Systems & Security

Identifier	Standard	Fully Aligned?
HS-SYS-HW-29	Differentiate an operating system as a special type of software that manages both the hardware and other software components of a computing system, including handling memory and peripherals.	✅
HS-SYS-HW-30	Demonstrate the capabilities and limitations of a physical or simulated computing device to address a task or problem.	✅
HS-SYS-SE-31	Identify different types of cybersecurity and physical security measures and the trade-offs for users, data, and devices.	✅
HS-SYS-SE-32	Classify the causes and impacts of security breaches and social engineering attacks for individuals, industries, communities, and governments.	
HS-SYS-SE-33	Formulate a solution to a security flaw in a given system.	✅
HS-SYS-NT-34	Diagram a network of computing systems, including hardware and software.	✅
HS-SYS-NT-35	Analyze how the internet functions as a network of networks and how it differs from other types of networks.	✅
HS-SYS-IM-36	Evaluate the rationale behind a law or policy governing the design and use of computing systems.	✅
HS-SYS-IM-37	Investigate how computing systems and infrastructure impact society and the environment, identifying who is affected and why.	✅

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Computing & Society

Identifier	Standard	Fully Aligned?
HS-SOC-HI-38	Analyze the historical trajectory of a specific computing technology and how its development is linked to societal and environmental factors.	
HS-SOC-HI-39	Propose modifications to an existing policy or piece of legislation that encourages ethical innovation and minimizes societal risks associated with technology.	✅
HS-SOC-ET-40	Evaluate the fundamental technological differences between an emerging technology and established technologies and how those differences influence computing.	✅
HS-SOC-ET-41	Evaluate the societal and environmental impacts of an emerging technology, including those that lead to inequities in access and outcomes.	✅
HS-SOC-ET-42	Design a conceptual solution to a real-world problem using an emerging technology, analyzing its potential benefits and harms.	✅
HS-SOC-HU-43	Evaluate how human choices in using, designing, deploying, and regulating computing technologies have risks, benefits, and long-term impacts.	✅
HS-SOC-HU-44	Debate perspectives on differences between human and artificial intelligence and their implications for consciousness, ethics, and human responsibility.	
HS-SOC-CE-45	Analyze how diverse teams of people use computational thinking and computing technologies to solve problems and express ideas.	✅
HS-SOC-CE-46	Connect computing knowledge and skills acquired to students' personal goals and career aspirations.	

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Alignment to High School Specialty Standards

Artificial Intelligence – Specialty I

Identifier	Standard	Fully Aligned?
S1-AIN-DD-01	Analyze AI systems to differentiate the types of problems they address.	✅
S1-AIN-DD-02	Modify AI system training data to improve fairness and accuracy in outputs.	
S1-AIN-DD-03	Create an application using a prebuilt supervised learning model to make a classification or prediction.	
S1-AIN-DD-04	Compare data representations and how representation choice constrains applicable algorithms.	
S1-AIN-DD-05	Evaluate whether an AI or non-AI computational solution is appropriate for a real-world problem.	✅
S1-AIN-DS-06	Examine how data flows through a neural network structure.	
S1-AIN-DS-07	Apply data acquisition, cleaning, and transformation techniques to prepare data for AI analysis.	
S1-AIN-HR-08	Plan safeguards for AI systems that protect human well-being and privacy while ensuring meaningful human involvement in decision-making.	✅
S1-AIN-HR-09	Analyze the potential biases and limitations of AI systems.	✅
S1-AIN-HR-10	Analyze the environmental impacts of widespread AI adoption.	
S1-AIN-PP-11	Integrate a prebuilt AI agent into an application.	
S1-AIN-PP-12	Analyze how AI tools shape user experiences for people with diverse backgrounds and characteristics.	✅
S1-AIN-PP-13	Assess how unauthorized data collection has influenced the practice of training AI models.	✅
S1-AIN-PP-14	Evaluate how ethical implications of AI have changed over time.	

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Cybersecurity – Specialty I

Identifier	Standard	Fully Aligned?
S1-CYB-ND-01	Analyze the role of network services and protocols in secure communication and their potential vulnerabilities.	
S1-CYB-ND-02	Examine the concepts of the Open Systems Interconnection (OSI) model and their role in network communication.	
S1-CYB-ND-03	Distinguish between networks based on their protocols, topologies, and addressing schemes.	
S1-CYB-ND-04	Examine security risks in digital systems and corresponding mitigation strategies.	✅
S1-CYB-NO-05	Apply diagnostic tools and techniques to resolve network connectivity issues.	
S1-CYB-NO-06	Analyze system processes and network activity using command-line tools to identify potential security concerns.	
S1-CYB-TS-07	Analyze how common cyber threats related to network activity exploit system vulnerabilities.	
S1-CYB-TS-08	Evaluate a security threat using the CIA triad, states of data, and types of control.	✅
S1-CYB-TS-09	Analyze how encryption methods in network communication protect privacy and security.	✅
S1-CYB-TS-10	Evaluate security measures as part of a layered defense strategy to protect sensitive information.	✅
S1-CYB-CP-11	Explain the importance of cybersecurity policies in protecting organizational assets and mitigating risks.	
S1-CYB-CP-12	Explain key components of effective security policies.	
S1-CYB-PP-13	Analyze the potential consequences of a cybersecurity decision on individuals, organizations, and society.	✅
S1-CYB-PP-14	Analyze social engineering techniques and how they exploit human cognitive biases and organizational weaknesses.	✅
S1-CYB-PP-15	Translate cybersecurity concepts, risks, and solutions clearly to both technical and nontechnical audiences.	✅

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Cybersecurity – Specialty II

Identifier	Standard	Fully Aligned?
S2-CYB-ND-01	Integrate security features in networking hardware and software.	
S2-CYB-ND-02	Design a secure network, including servers, switches, routers, endpoints, and firewalls.	
S2-CYB-ND-03	Evaluate the security implications of different network topologies.	
S2-CYB-NO-04	Analyze network traffic patterns to distinguish between normal and potentially malicious behavior.	
S2-CYB-NO-05	Analyze cybersecurity tasks to improve efficiency and reliability.	
S2-CYB-TS-06	Design access controls to protect sensitive information.	✅
S2-CYB-TS-07	Evaluate security risks to determine appropriate risk management strategies.	
S2-CYB-TS-08	Examine an incident response plan for a real-world scenario.	
S2-CYB-CP-09	Debate how various regulations impact organizational security policies, procedures, and compliance.	
S2-CYB-PP-10	Analyze the benefits, risks, and ethical implications of AI in cybersecurity.	✅
S2-CYB-PP-11	Analyze cybersecurity vulnerabilities and incidents to inform responsible disclosure practices.	
S2-CYB-PP-12	Create documentation of cybersecurity processes and decisions that supports team coordination and accountability.	

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Data Science – Specialty I

Identifier	Standard	Fully Aligned?
S1-DSC-CC-01	Apply exploratory data analysis techniques to non-hierarchical quantitative data.	✅
S1-DSC-CC-02	Interpret metadata when using data collected by others.	
S1-DSC-CC-03	Develop a program to manipulate and transform data to prepare for analysis.	
S1-DSC-AM-04	Apply appropriate analytic and visualization techniques for categorical and quantitative data.	✅
S1-DSC-AM-05	Examine missing data and its impact on data analysis.	
S1-DSC-AM-06	Analyze structured categorical and/or quantitative datasets, using computational tools and libraries.	
S1-DSC-MI-07	Interpret the results of a data analysis to explain patterns, anomalies, and trends, and connect them back to the original problem or research question.	✅
S1-DSC-MI-08	Explain the appropriateness of predictive models for the specific problem being addressed.	
S1-DSC-MI-09	Explain how dataset size affects model stability and performance.	
S1-DSC-VZ-10	Create a data visualization that communicates key findings to diverse audiences.	✅
S1-DSC-VZ-11	Analyze how graphical conventions in data visualizations support accurate interpretation and how breaking conventions can mislead.	✅
S1-DSC-PP-12	Apply ethical principles to data collection, analysis, and communication to promote privacy, transparency, and accountability.	
S1-DSC-PP-13	Assess how data collection and use may impact marginalized and underrepresented groups.	✅
S1-DSC-PP-14	Document data analysis results in a format appropriate for an audience with diverse backgrounds and perspectives.	✅

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Data Science – Specialty II

Identifier	Standard	Fully Aligned?
S2-DSC-CC-01	Apply exploratory data analysis techniques to a hierarchical structured data source.	
S2-DSC-CC-02	Document the origin, structure, and preparation of a dataset to support clarity and reproducibility.	
S2-DSC-CC-03	Develop a program to collect and integrate data from multiple sources.	
S2-DSC-CC-04	Choose appropriate data to collect for a data science project based on available tools, skills, and project goals.	
S2-DSC-AM-05	Build a model to explain relationships, make predictions, and evaluate the influence of different variables.	
S2-DSC-AM-06	Evaluate strategies for handling missing data.	✅
S2-DSC-AM-07	Analyze an unstructured, mixed-type, or high-dimensional dataset using computational tools and libraries.	
S2-DSC-MI-08	Evaluate the performance of models using established metrics.	
S2-DSC-MI-09	Analyze the trade-offs between interpretability, accuracy, and generalizability as they relate to model complexity.	
S2-DSC-MI-10	Analyze how adding or removing variables affects model behavior and performance.	
S2-DSC-VZ-11	Create a visualization that accurately represents data and avoids misleading design choices.	
S2-DSC-VZ-12	Critique a data visualization for misleading elements and their role in spreading misinformation.	✅
S2-DSC-PP-13	Evaluate ethical, legal, and social considerations when working with large-scale datasets, predictive models, and emerging technologies.	
S2-DSC-PP-14	Evaluate protective measures in data collection, usage, and governance for privacy, security, and fairness.	✅
S2-DSC-PP-15	Translate technical results for diverse audiences in professional communication artifacts.	✅

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Software Development – Specialty I

Identifier	Standard	Fully Aligned?
S1-SWD-DD-01	Implement linear data structures to organize and access collections of data when solving computational problems.	
S1-SWD-DD-02	Design software that accounts for complexity through abstraction.	
S1-SWD-DD-03	Use integrated development environment (IDE) features to streamline software development, including code editing, debugging, version control, and project management.	
S1-SWD-UX-04	Refine a user interface design using accessibility and responsive design tools.	✅
S1-SWD-UX-05	Create software that serves intended users and contexts using human-centered design principles.	✅
S1-SWD-TR-06	Use AI-assisted IDE tools or features to understand unfamiliar code and identify errors during debugging.	✅
S1-SWD-TR-07	Design a test plan that exercises program functionality, including edge cases, error conditions, and varied user inputs.	
S1-SWD-PP-08	Collaborate to develop software that reflects diverse perspectives.	

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Software Development – Specialty II

Identifier	Standard	Fully Aligned?
S2-SWD-DD-01	Apply associative and hierarchical data structures to solve computational problems.	
S2-SWD-DD-02	Develop a prototype using diverse user personas and user journey maps to guide design decisions.	
S2-SWD-DD-03	Develop a project in iterative cycles, documenting changes and the rationale for each cycle.	
S2-SWD-DD-04	Modify an existing algorithm to improve efficiency, considering factors such as data structures and algorithmic paradigms.	
S2-SWD-UX-05	Evaluate the user experience to improve usability.	
S2-SWD-UX-06	Create a user-friendly, accessible, and responsively designed interface.	✅
S2-SWD-TR-07	Use an IDE to test and refine a complex software project.	
S2-SWD-TR-08	Debug a complex software project to identify, isolate, and fix errors.	
S2-SWD-PP-09	Apply an industry-standard software development process to plan and deliver a project while prioritizing equity and justice.	

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