Standards

AI Literacy Framework (Review Draft May 2025)
Knowledge
Skills

Revised PreK-12 Computer Science Standards (CSTA): Draft 2.0 for Public Comment
Foundational Standards
Specialty Standards for High School - Artificial Intelligence

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AI Literacy Framework

Knowledge

		Lesson 1.1					Lesson 1.2				1.3	Lesson 2.1						Lesson 2.2				Lesson 2.3	
		A1.1.1	A1.1.2	A1.1.3	A1.1.4	P1.1.5	A1.2.1	A1.2.2	A1.2.3	P1.2.4	B1.3.1	A2.1.1	A2.1.2	A2.1.3	A2.1.4	A2.1.5	P2.1.6	A2.2.1	A2.2.2	A2.2.3	P2.2.4	A2.3.1	B2.3.2
The Nature of AI	K1.1: AI systems use algorithms that combine step-by-step procedures with statistical inferences (e.g., weights and biases) to process data, detect patterns, and generate probable outputs.													✓		✓		✓		✓	✓		
	K1.2: Machines “learn” by inferring how to generate outputs such as predictions, content, and recommendations that influence physical or virtual environments, in response to information from the input they receive. They do so with varying levels of autonomy and adaptiveness after deployment.								✓	✓				✓		✓			✓		✓		
	K1.3: Generative AI uses probabilities to generate human-like outputs across various modalities (e.g., text, audio, visuals) but lacks authentic understanding and intent.	✓		✓		✓	✓	✓	✓	✓	✓				✓			✓			✓		
	K1.4: AI systems operate differently depending on their purpose, whether to create, predict, recommend, or respond.													✓			✓				✓		
AI Reflects Human Choices and Perspectives	K2.1: Building and maintaining AI systems relies on humans to design algorithms, collect and label data, and moderate harmful content. These systems reflect human choices, assumptions, and labor practices, shaped by unequal global conditions.			✓				✓	✓	✓								✓		✓	✓		
	K2.2: AI is trained on vast datasets sourced from publicly available information, user-generated content, curated databases, and real-world data collected through sensors, interactions, and digital systems.			✓				✓	✓	✓						✓						✓	
	K2.3: AI systems gather new data from interactions with users; decisions, processes, and outputs may be directly influenced by inputs in real time.	✓					✓		✓	✓		✓	✓		✓	✓			✓	✓	✓		
	K2.4: AI systems are trained to identify patterns among data elements that humans have selected, categorized, and prioritized.							✓	✓	✓				✓	✓	✓		✓			✓	✓	
	K2.5: Bias inherently exists in AI systems, which can also reflect societal biases embedded in its training data or algorithm design. Humans can perpetuate or mitigate harmful biases in AI systems during the design, development, or testing process.							✓	✓	✓				✓		✓		✓		✓	✓		

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AI Reshapes Work and Human Roles	K3.1: AI systems automate structured tasks, augment decision-making, and transform industries, requiring humans to adapt, reskill, and upskill.								✓	✓									✓	✓			✓
	K3.2: AI integration requires individuals to determine which tasks are best suited for machines and which require human intervention or expertise.				✓				✓	✓						✓		✓	✓	✓	✓		✓
	K3.3: While AI can support analysis and prediction, humans must be responsible for decisions that reflect human judgment and ethical considerations.			✓			✓		✓	✓					✓	✓		✓		✓	✓		
AI Capabilities and Limitations	K4.1: AI excels at pattern recognition and automation but lacks emotions, ethical reasoning, context, and originality.	✓		✓				✓	✓	✓								✓		✓	✓		
	K4.2: AI requires vast amounts of computing power and data, which consumes energy, thus demanding limited natural resources and increasing carbon emissions. AI's long-term sustainability impact, both positive and negative, largely depends on how it is implemented and utilized.																			✓			
	K4.3: The capability of generative AI, particularly large language models (LLMs), to generate humanlike content can make it difficult to distinguish fact from fabrication, increasing the potential to generate misinformation, deepfakes, or manipulative materials.			✓		✓	✓		✓	✓								✓		✓	✓		
AI's Role in Society	K5.1: AI plays an increasingly prevalent role in decision-making that impacts humans, from hiring practices to healthcare to criminal justice.								✓	✓								✓		✓	✓		
	K5.2: AI systems must be understood, audited, and regulated to ensure that their use leads to more benefits than harm for individuals and society.														✓	✓		✓		✓	✓		
	K5.3: Generative AI and Large Language Models create content based on existing materials in training data, which includes copyright-protected work, thereby raising questions about authenticity, authorship, and ownership.			✓		✓																	
	K5.4: Ethical AI design encompasses fairness, transparency, explainability, accountability, respect for privacy, and legal compliance			✓												✓				✓	✓		

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	A1.1.1	A1.1.2	A1.1.3	A1.1.4	P1.1.5	A1.2.1	A1.2.2	A1.2.3	P1.2.4	B1.3.1	A2.1.1	A2.1.2	A2.1.3	A2.1.4	A2.1.5	P2.1.6	A2.2.1	A2.2.2	A2.2.3	P2.2.4	A2.3.1	B2.3.2
S1: Evaluate AI-generated content for accuracy, fairness, and bias to make informed and ethical decisions.	✓		✓	✓	✓			✓	✓								✓		✓	✓		
S2: Collaborate with AI to create and refine original ideas while considering issues of ownership, attribution, and responsible use.		✓		✓	✓													✓		✓		
S3: Decompose problems and provide instructions in ways that allow AI systems to effectively contribute to solutions.										✓		✓				✓		✓	✓	✓	✓	
S4: Recognize how AI influences personal choices, relationships, and communities, and reflect on its broader societal and environmental impact.							✓										✓		✓	✓		
S5: Work effectively with AI and humans by communicating clearly, giving feedback, and navigating shared tasks.								✓	✓									✓	✓	✓		✓
S6: Explain how AI is used in a way that promotes transparency, avoids anthropomorphism, and encourages responsible use.	✓				✓												✓			✓		
S7: Determine when and how to use AI for a task by assessing its capabilities, risks, and ethical implications.			✓		✓	✓	✓										✓		✓	✓		

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Revised PreK-12 CSTA Standards

Foundational Standards

		Lesson 1.1					Lesson 1.2				1.3	Lesson 2.1						Lesson 2.2				Lesson 2.3	
		A1.1.1	A1.1.2	A1.1.3	A1.1.4	P1.1.5	A1.2.1	A1.2.2	A1.2.3	P1.2.4	B1.3.1	A2.1.1	A2.1.2	A2.1.3	A2.1.4	A2.1.5	P2.1.6	A2.2.1	A2.2.2	A2.2.3	P2.2.4	A2.3.1	B2.3.2
Algorithms (ALG)	**Algorithm Fundamentals**																						
	HS-ALG-AF-02. Describe the differences between deterministic algorithms and probabilistic algorithms.						✓											✓					
	HS-ALG-AF-04. Design procedures that include sequence, selection, and iteration.																				✓	✓	
	Human-Centered Design																						
	HS-ALG-HD-06. Design algorithms for diverse audiences by incorporating feedback, evaluating effectiveness, and identifying potential harms or unintended consequences.								✓	✓											✓		
	Problem Solving																						
	HS-ALG-PS-07. Determine how variables and constants affect an algorithm's results.																			✓	✓		
	Impacts of Algorithms																						
	HS-ALG-IM-11. Evaluate the societal impacts, ethical implications, potential biases, and unintended consequences of both deterministic and probabilistic algorithms.						✓	✓										✓			✓		
Programming (PRO)	**Programming Fundamentals**																						
	HS-PRO-PF-01. Convert an algorithm written in pseudocode into a program that uses sequence, selection, iteration, procedures with parameters, and lists.																					✓	
	Program Develoment																						
	HS-PRO-PD-07. Evaluate the societal impacts, ethical implications, potential biases, and unintended consequences of using AI tools for program development.																	✓		✓			
	Testing and Refining Code																						
	HS-PRO-TR-12. Verify that a program performs according to its design specifications and documented test cases.						✓														✓		
	HS-PRO-TR-13. Assess the accuracy, efficiency, and ethical considerations of computer-generated code.						✓														✓		
	Project Management																						
	HS-PRO-PM-14. Apply correct attribution to intellectual property (e.g., code, libraries, use of AI).								✓														
	HS-PRO-PM-16. Critique the societal impacts and unintended computational impacts of program modifications from the lenses of specific user groups.								✓	✓													

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Data and Analysis (DAA)	**Data Fundamentals**																						
	HS-DAA-DF-02. Use computational tools such as programs or spreadsheets to generate data that fits certain parameters (e.g., random numbers, normal distributions, random samples from a larger dataset) for use in simulations.								✓	✓													
	Data Processing																						
	HS-DAA-DP-05. Reshape data, using computational tools (e.g., transform from tall to wide format, make or flatten hierarchy).								✓														
	HS-DAA-DP-06. Use computational tools to clean and organize text-based data (e.g., trimming white space, standardizing capitalization, and sorting open-ended responses into categories).								✓	✓													
	HS-DAA-DP-07. Use computational tools to identify and address outliers and out-of-bounds values in data.								✓	✓													
	Data Investigation																						
	HS-DAA-DI-11. Design a process that uses computational tools to collect data to answer a question, make classifications, or make predictions.								✓	✓													
	HS-DAA-DI-13. Evaluate data visualizations, based on visual appeal, clarity, accessibility, and integrity.								✓	✓													
	HS-DAA-DI-14. Justify a data-driven conclusion to a data question by creating a formal report that explains the investigative process and supports the conclusion with evidence, including potential biases or limitations that might lead to alternative interpretations.								✓	✓													
	Impacts of Data Science																						
	HS-DAA-IM-15. Analyze the consequences of using data in AI/ML applications, including how biased training data can lead to biased output and reinforce societal inequalities and injustices with misinformation and disinformation.			✓				✓	✓					✓						✓			
	HS-DAA-IM-16. Evaluate the societal, environmental, and ethical implications of largescale data collection and usage.								✓	✓													
	HS-DAA-IM-18. Write plans to solve a specific problem, using the results of a data investigation.								✓	✓													

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Systems and Security (SAS)	**Hardware and Software**																						
	HS-SAS-HW-01. Describe computing devices used in industry (e.g., robots, electronic control units in vehicles, medical imaging devices), how they function, and how they are used to accomplish tasks and/or solve problems.								✓	✓													
	Impacts of Computing Systems																						
	HS-SAS-IM-11. Debate the trade-offs of global access to computing systems for society in terms of societal norms, interactions, and digital engagement.														✓					✓			
	HS-SAS-IM-13. Investigate the societal and environmental impacts of computing systems and the physical infrastructure that supports them (e.g., data centers, servers, and mobile devices).														✓								
Computing and Society (CAS)	**Emerging Technologies**																						
	HS-CAS-ET-07. Evaluate an emerging technology through multiple ethical perspectives.			✓	✓	✓		✓															
	HS-CAS-ET-09. Evaluate the societal and environmental impacts of emerging technologies, including those that lead to inequities in access and outcomes.								✓	✓													
	Career Exploration																						
	HS-CAS-CE-11. Investigate how professionals apply CS in their careers, drawing from their personal narratives.						✓																

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Revised PreK-12 CSTA Standards

Specialty Standards - Artifical Intelligence

		Lesson 1.1					Lesson 1.2				1.3	Lesson 2.1						Lesson 2.2				Lesson 2.3	
		A1.1.1	A1.1.2	A1.1.3	A1.1.4	P1.1.5	A1.2.1	A1.2.2	A1.2.3	P1.2.4	B1.3.1	A2.1.1	A2.1.2	A2.1.3	A2.1.4	A2.1.5	P2.1.6	A2.2.1	A2.2.2	A2.2.3	P2.2.4	A2.3.1	B2.3.2
Specialty I	**AI Concepts, Development, and Application**																						
	S1-AIN-CD-01. Apply data collection and cleaning techniques to prepare data for AI analysis and modeling.								✓	✓		✓			✓								
	S1-AIN-CD-02. Apply foundational knowledge and skills in prompt engineering to generate outputs from AI models.	✓	✓	✓	✓		✓		✓	✓			✓						✓	✓	✓		
	S1-AIN-CD-03. Explain the principles of natural language processing (NLP) and their application in AI.						✓																
	S1-AIN-CD-05. Develop a computational artifact that integrates an existing AI tool.								✓	✓							✓			✓	✓	✓	
	AI History, Ethics, and Human Interaction																						
	S1-AIN-HE-06. Evaluate the role of human decision-making in the development of emerging technologies.			✓			✓	✓	✓	✓					✓	✓		✓	✓	✓	✓		
	S1-AIN-HE-07. Summarize the historical development, current capabilities, potential future applications, and ethical implications of AI.								✓	✓													
	S1-AIN-HE-08. Analyze machine learning model optimization techniques, accuracy metrics, decision-making processes, and ethical considerations related to model use.													✓									
Specialty II	**AI Concepts, Development, and Application**																						
	S2-AIN-CD-09. Compare different computational solutions to real-world problems, including how AI tools and libraries are used in different solutions.								✓	✓						✓							
	S2-AIN-CD-11. Apply data analysis techniques, including regression models and probabilistic reasoning, to extract insights from datasets and make informed predictions.								✓	✓				✓									
	AI History, Ethics, and Human Interaction																						
	S2-AIN-HE-14. Conduct user interviews to gain insights into AI user needs and experiences.								✓	✓													
	S2-AIN-HE-15. Analyze the ethical implications of AI, including bias, fairness, transparency, and accountability.				✓			✓	✓	✓					✓			✓		✓	✓		
	S2-AIN-HE-16. Critically analyze the potential biases and limitations of advanced ML techniques.															✓							
	S2-AIN-HE-17. Apply bias mitigation strategies to ensure fairness in student-created AI systems.								✓	✓						✓					✓		