PK–12 Foundational Computer Science Standards, Revised 2026 - DRAFT 3.0

		PK/K	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Middle School (Grades 6-8)	High School (Grades 9-12)
Algorithms & Design	**Algorithm Fundamentals**	EK-ALG-01: Carry out algorithms in daily activities.	E1-ALG-01: Decompose a problem or task into individual parts to develop an algorithm.	E2-ALG-01: Create an algorithm that includes sequence, events, and iteration to solve a problem or express ideas.	E3-ALG-01: Create an algorithm that includes sequence, events, iteration, and selection to solve a problem or express ideas.	E4-ALG-01: Write a description of an algorithm using everyday language that incorporates a combination of sequence, events, iteration, and selection to solve a problem or express ideas.	E5-ALG-01: Construct a visual representation of an algorithm that incorporates a combination of sequence, events, iteration, selection, and variables to solve a problem or express ideas.	MS-ALG-01: Develop an algorithm that includes variables, data, and storage. MS-ALG-02: Create a flowchart or pseudocode that includes a combination of sequence, events, iteration, selection, and variables to model an algorithm.	HS-ALG-01: Develop an algorithm that includes at least one procedure that has sequence, iteration, and selection.
	Problem Solving							MS-ALG-03: Verify the correctness of an algorithm for given inputs. MS-ALG-04: Decide whether to use rule-based, data-driven, or hybrid approaches when solving problems. MS-ALG-05: Generate outputs from AI models to assist in solving a computational problem.	HS-ALG-02: Evaluate algorithms for efficiency, correctness, and clarity, using metrics or test cases. HS-ALG-03: Optimize the design of an algorithmic solution using abstractions such as procedures, modules, lists, and/or objects. HS-ALG-04: Evaluate AI-generated output to assess bias, accuracy, and potential harms.
	Machine Learning	EK-ALG-02: Recognize patterns that people and machines can use to make decisions.	E1-ALG-02: Investigate how patterns can be used by people and machines to make predictions and classify objects into categories.	E2-ALG-02: Examine how computing technologies can learn from patterns in data.	E3-ALG-02: Investigate how AI models can evolve when new data is added to a training set.	E4-ALG-02: Train an AI model to make a classification or prediction.	E5-ALG-02: Analyze relationships between the properties of training data and an AI model's output.	MS-ALG-06: Make informed predictions about the hidden processes and functions of AI and other complex systems. MS-ALG-07: Investigate ways to improve the accuracy of an AI model and reduce bias by refining the quality of examples and non-examples in its training data. MS-ALG-08: Create a model card to describe the features and limitations of an AI model.	HS-ALG-05: Justify the selection of an AI algorithm to accomplish a task. HS-ALG-06: Evaluate training data by examining its source, quality, representativeness, potential biases, and privacy implications before using it to solve a problem. HS-ALG-07: Develop an AI model for a chosen task using appropriate data and tools.
	Impacts of Algorithms and Design	EK-ALG-03: Describe how people make algorithms.	E1-ALG-03: Illustrate how changes to algorithms lead to different outcomes for people.	E2-ALG-03: Describe how algorithms might impact peers in varied situations.	E3-ALG-03: Compare how different algorithms for solving the same problem produce outcomes that may benefit or disadvantage different groups of people.	E4-ALG-03: Evaluate how different algorithms may affect outcomes, situations, and people with a wide range of needs.	E5-ALG-03: Articulate how human-centered design principles can be incorporated into the development of computational solutions, including AI and other emerging technologies.	MS-ALG-09: Plan the design of a computational solution, considering human-centered design principles. MS-ALG-10: Describe evidence of beneficial and harmful impacts, ethical issues, and biases of algorithms encountered in daily life. MS-ALG-11: Modify an algorithm to address a specific societal impact, ethical issue, or bias.	HS-ALG-08: Develop computational solutions using human centered design principles. HS-ALG-09: Evaluate the ethical implications, societal impacts, and potential biases of rule-based and data-driven algorithms. HS-ALG-10: Articulate the values embedded in the design of algorithmic systems.

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Programming	**Programming Fundamentals**	EK-PRO-04: Create a sequence of commands to complete a simple task or express ideas.	E1-PRO-04: Create code from an algorithm that includes sequence and events to complete a task or express ideas.	E2-PRO-04: Create code from an algorithm that includes sequence, events, and iteration to complete a task or express ideas.	E3-PRO-04: Develop code from a student-created algorithm that includes sequence, events, iteration, and selection to complete a task or express ideas.	E4-PRO-04: Compare different programming solutions to the same problem based on their correctness and clarity.	E5-PRO-04: Create a novel program by modifying or combining elements of existing programs.	MS-PRO-12: Use procedures to structure code for clarity and reusability. MS-PRO-13: Use reference documentation and online resources to write, debug, and improve programs. MS-PRO-14: Explain the importance of attribution and intellectual property in programming. MS-PRO-15: Apply inclusive collaboration practices to develop a program.	HS-PRO-11: Create a modular program that uses procedures, modules, or objects to improve reusability and readability. HS-PRO-12: Use documentation, libraries, Application Programming Interfaces (APIs), and development tools to write, debug, and improve programs. HS-PRO-13: Apply proper attribution and respect intellectual property in digital artifacts. HS-PRO-14: Collaborate on a programming project using a defined workflow that includes design documentation, version control, and clear task roles. HS-PRO-15: Translate an algorithm written in pseudocode into a working program that
	Program Development		E1-PRO-05: Discuss how a program might affect different users.	E2-PRO-05: Collaborate with a partner to develop a program that solves a problem or expresses an idea.	E3-PRO-05: Use structured, constructive feedback to improve programs.	E4-PRO-05: Collaborate with a team by offering a meaningful contribution to creating a program.	E5-PRO-05: Construct individual components of a program that are collaboratively assembled into a working project.		
	Reading and Documenting Code	EK-PRO-05: Describe how code has completed a task.	E1-PRO-06: Explain the function of code that includes sequence and events.	E2-PRO-06: Explain the steps taken during program development, recognizing the contributions of others in the process.	E3-PRO-06: Articulate how a specific segment of code contributes to the overall purpose of a program.	E4-PRO-06: Document a program to clarify its functionality.	E5-PRO-06: Create embedded or external documentation for a programming project.	MS-PRO-16: Analyze how a segment of code works by identifying the roles of iteration, selection, variables, and procedures. MS-PRO-17: Examine AI-generated code for accuracy and usability in a programming project.	HS-PRO-16: Analyze how a segment of code works, including the role of sequence, iteration, selection, variables, procedures, parameters, and data structures. HS-PRO-17: Evaluate AI-generated code for accuracy, reliability, and alignment with program requirements.
	Testing and Refining Code	EK-PRO-06: Identify steps in a sequence of commands that do not work as expected.	E1-PRO-07: Debug programs that include sequence and events.	E2-PRO-07: Debug programs that include sequence, events, and iteration.	E3-PRO-07: Debug iteration errors and selection errors in a program.	E4-PRO-07: Debug programs that include sequence, events, iteration, and selection.	E5-PRO-07: Debug programs using systematic strategies.	MS-PRO-18: Use standard practices to test, debug, document, and peer-review code. MS-PRO-19: Refine a program based on user feedback to improve its usability and accessibility.	HS-PRO-18: Evaluate a program's alignment with design specifications and responsible design values, including its correctness, effectiveness, and user experience. HS-PRO-19: Refine a program based on user feedback and testing results, applying responsible design values to improve functionality, usability, accessibility, accuracy, and efficiency.
	Data Handling	EK-PRO-07: Identify everyday gestures and symbols that represent information people use to make choices.	E1-PRO-08: Identify terms that refer to values that change over time in everyday life.	E2-PRO-08: Label different representations of information with a name and whether its value is constant or changes.	E3-PRO-08: Identify the variables being stored and manipulated in a program.	E4-PRO-08: Trace how data flows through a program and changes variable values during execution.	E5-PRO-08: Use variables to store, compare, and modify data within a program.	MS-PRO-20: Use appropriate data types and structures to store, modify, update, and iterate over data within a program.	HS-PRO-20: Create a program that uses appropriate data structures to store, access, and manipulate data. HS-PRO-21: Compare fundamental data types and their uses.

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Data & Analysis	**Data Fundamentals**	EK-DAA-08: Demonstrate how people create and collect data to help answer questions.	E1-DAA-09: Use multiple methods, including observation, measurement, and survey, to collect both numeric and non-numeric data.	E2-DAA-09: Compare numeric and non-numeric types of data in terms of how they are collected and what they can tell us.	E3-DAA-09: Evaluate numeric and non-numeric data for accuracy and completeness.	E4-DAA-09: Organize collected data into tables using digital tools, with rows representing records and columns representing attributes.	E5-DAA-09: Use digital tools to collect and organize different types of data.	MS-DAA-21: Evaluate how different levels of precision and granularity in data collection affect accuracy, storage, and analysis. MS-DAA-22: Explain how data and its associated metadata can be used to answer questions.	HS-DAA-22: Use a digital tool to generate data that fits certain parameters for use in simulations. HS-DAA-23: Create a data dictionary that describes the names and types of attributes, allowable values/ranges for each attribute, and logical relationships between variables in a dataset.
	Data Processing							MS-DAA-23: Use a digital tool to sort, filter, group, aggregate, and otherwise transform quantitative and qualitative data. MS-DAA-24: Analyze options to address data quality issues.	HS-DAA-24: Use a digital tool to clean and organize text-based data. HS-DAA-25: Evaluate different approaches to verifying consistency and compliance with expected data types, values, and ranges.
	Data Investigation	EK-DAA-09: Investigate a question that can be answered by collecting data in students' everyday environments.	E1-DAA-10: Compare questions that can be answered with data investigations and questions that are answered through other means.	E2-DAA-10: Develop a question that can be answered with data.	E3-DAA-10: Investigate a data question involving relationships between multiple attributes.	E4-DAA-10: Write a brief narrative that includes at least one data visualization to report the process and results of a data investigation, using computing tools.	E5-DAA-10: Analyze a dataset to identify the nature and possible sources of variability in the data.	MS-DAA-25: Use computational tools to identify relationships among variables in a dataset and make classifications or predictions. MS-DAA-26: Create data visualizations to show how different design choices can impact the interpretation of the same data. MS-DAA-27: Summarize a data investigation process by describing the question, the data collection and analysis methods, potential biases and limitations, and the evidence supporting the conclusion.	HS-DAA-26: Use computational tools to create data visualizations of multivariate data sets to answer a question, classify, or make predictions. HS-DAA-27: Evaluate the results of data simulations and data visualizations to help answer data questions and to inform decision-making, including identifying limitations.
	Impacts of Data Science	EK-DAA-10: Investigate how data can help a person make informed decisions in everyday life.	E1-DAA-11: Examine a variety of data questions that address the needs of a person or community.	E2-DAA-11: Distinguish between data collection approaches, including those that may lead to inaccurate or biased data.	E3-DAA-11: Design a data collection process that addresses the needs of people from different backgrounds or groups.	E4-DAA-11: Investigate how data collected about people may affect individuals and groups.	E5-DAA-11: Analyze the benefits and risks of computing technology that uses collected data.	MS-DAA-28: Explain the benefits and risks of allowing personal data and metadata to be collected and incorporated into datasets, including data ownership, privacy, and sovereignty. MS-DAA-29: Analyze how decisions made during data collection, data processing, data analysis, and data presentation can lead to biased data, misleading conclusions, and compromised AI models.	HS-DAA-28: Evaluate the societal, environmental, and ethical implications of large-scale data collection and processing, including AI applications. HS-DAA-29: Debate the efficacy of policies and regulations to ensure responsible data use.

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Systems & Security	**Hardware and Software**	EK-SAS-11: Examine the use of tools to accomplish tasks or solve problems for different users.	E1-SAS-12: Describe the purpose of basic hardware components of a computing system, using accurate terminology.	E2-SAS-12: Explain how the basic hardware components of a computing system, including sensors, work together to perform input and output (I/O) operations.	E3-SAS-12: Describe the role of software in a computing system to accomplish tasks or solve problems.	E4-SAS-12: Apply basic troubleshooting processes to identify and fix common hardware and software issues.	E5-SAS-12: Explain how hardware and software components of a computing system work together to perform input and output (I/O), processing, and storage.	MS-SAS-30: Examine differences between computing systems based on user needs, system requirements, and potential societal, environmental, and ethical impacts. MS-SAS-31: Describe computing devices used in industry, their basic functions, and how they are used to accomplish tasks and/or solve problems.	HS-SAS-30: Differentiate operating systems 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-SAS-31: Apply a physical or simulated computing device to address a real-world task or problem, demonstrating understanding of its capabilities and limitations.
	Security	EK-SAS-12: Differentiate between public and private information.	E1-SAS-13: Describe how to keep online accounts safe from unauthorized access.	E2-SAS-13: Explain how online actions have real-world consequences and that laws and rules may also apply when online.	E3-SAS-13: Distinguish between authentication and authorization in protecting devices and private information.	E4-SAS-13: Evaluate how sharing information online might reveal personally identifiable information (PII) and other details to people other than the intended recipients.	E5-SAS-13: Describe the concepts of the CIA (Confidentiality, Integrity, Access) Triad and how each part is important in protecting information.	MS-SAS-32: Explain the effects of failing to use the CIA (Confidentiality, Integrity, Access) Triad. MS-SAS-33: Evaluate common types of cyber attacks, including social engineering and malware, and preventions.	HS-SAS-32: Identify different types of cybersecurity and physical security measures and the trade-offs for users, data, and devices. HS-SAS-33: Classify the causes and impacts of security breaches and social engineering attacks for individuals, industries, communities, and governments. HS-SAS-34: Formulate a solution to a security flaw in a given system.
	Networks				E3-SAS-14: Explain how people access the Internet to gain information and communicate with each other.	E4-SAS-14: Critique the ways computing devices connect to the Internet, wired or wireless.	E5-SAS-14: Investigate the components of wired and wireless networks.	MS-SAS-34: Model how information in a network is broken down into packets, transmitted between devices, and reassembled. MS-SAS-35: Explain how the resilience of the Internet depends on the interconnected devices, including their roles and functions within the network.	HS-SAS-35: Diagram a network of computing systems, including hardware and software HS-SAS-36: Analyze how the Internet functions as a network of networks, including similarities and differences between the Internet and other types of networks in terms of structure, protocols, and scalability.
	Impacts of Computing Systems	EK-SAS-13: Identify an individual's role in responsibly using computing systems and tools.	E1-SAS-14: Describe an individual's role in responsibly using computing systems and tools.	E2-SAS-14: Describe the benefits and harms that arise from an individual's use of computing technology.	E3-SAS-15: Describe how widely used computing technologies may impact an individual's life and community.	E4-SAS-15: Investigate the impacts for widely used computing technologies on natural resources and the environment.	E5-SAS-15: Examine how computing technologies impact culture and the ways people live and work.	MS-SAS-36: Collaboratively improve the design of a computing system so it can be better used by people with different needs, abilities, and ways of thinking. MS-SAS-37: Examine differences in access to computing systems, based on personal and social factors, including physical ability, geographic location, socioeconomic status, and age.	HS-SAS-37: Evaluate the rationales behind laws and policies governing the design and use of computing systems. HS-SAS-38: Investigate how computing systems and infrastructure impact society and the environment, identifying who is affected and why.

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Computing & Society	**History of Computing**	EK-CAS-14: Identify computing technologies used in daily life that have changed over time.	E1-CAS-15: Compare how one familiar daily activity was done before and after the introduction of a specific computing technology.	E2-CAS-15: Analyze the ways that people from different cultures, backgrounds, and time periods have designed computing technologies to help them solve problems and express themselves.	E3-CAS-16: Examine how computing innovations have changed the ways people live, work, or communicate over time.	E4-CAS-16: Investigate the contributions of diverse and often overlooked individuals and communities in the history of computing.	E5-CAS-16: Analyze how the inclusion or exclusion of diverse and often overlooked individuals and communities has shaped the design, development, and societal impact of computing technologies.	MS-CAS-38: Compare the roles of individuals, communities, organizations, and governments in shaping computing technologies across major eras in computing history. MS-CAS-39: Analyze intended and unintended impacts of historical computing technologies on society and the environment.	HS-CAS-39: Analyze the historical trajectory of specific computing technologies and how their development is linked to social, political, environmental, and economic factors. HS-CAS-40: Propose modifications to existing policies and legislation that encourage ethical innovation and minimize societal risks associated with technology.
	Emerging Technologies				E3-CAS-17: Describe how new technologies create both benefits and risks in personal and family life.	E4-CAS-17: Analyze how the limitations of existing technologies can lead to emerging technologies.	E5-CAS-17: Examine how people decide whether or not to use emerging technologies.	MS-CAS-40: Evaluate when it is appropriate to use AI and other emerging technologies to solve a problem based on their capabilities, limitations, and environmental impacts. MS-CAS-41: Evaluate how design decisions in emerging technologies influence user experiences differently across different communities. MS-CAS-42: Debate ways an emerging technology impacts the social, cultural, and ecological issues in their communities.	HS-CAS-41: Hypothesize how AI or another emerging technology could lead to enhancements or alternative approaches for an existing computing system or device. HS-CAS-42: Evaluate the societal and environmental impacts of emerging technologies, including those that lead to inequities in access and outcomes. HS-CAS-43: Design a conceptual or prototype solution to a real-world problem using an emerging technology, supported by credible research and an ethical analysis of its potential benefits and harms to people and the environment.
	Humans and Computing	EK-CAS-15: Describe that people design and develop computing technologies.	E1-CAS-16: Differentiate between activities that humans do well and activities that computing technologies do well.	E2-CAS-16: Investigate situations where humans have created computing technologies to solve problems.	E3-CAS-18: Examine why people design and build computing technologies, including AI.	E4-CAS-18: Distinguish between the ways humans learn and the ways computing technologies learn.	E5-CAS-18: Evaluate when it is appropriate to use or not use computing technologies to solve a problem.	MS-CAS-43: Analyze how the decisions humans make when using computing technologies influence ethical and social outcomes.	HS-CAS-44: Evaluate how human choices in using, designing, deploying, and regulating computing technologies influence their risks, benefits, and long-term impacts. HS-CAS-45: Debate perspectives on the necessary differences between human and artificial intelligence, including implications for sentience, consciousness, ethics, rights, and societal responsibilities.
	Career Exploration	EK-CAS-16: Identify how people use digital devices in their homes, schools, and work.	E1-CAS-17: Describe how computing is used by people in your life at home, school, and work.	E2-CAS-17: Investigate how your personal interests connect to computing in different industries and careers.	E3-CAS-19: Explain how people in different industries use computing technologies and skills to accomplish their work.	E4-CAS-19: Investigate how the workforce adopts new computing technologies and continues to update their computing skills.	E5-CAS-19: Examine how professionals collaborate while using computing technologies to solve problems.	MS-CAS-44: Analyze how workers in different careers use computational thinking to solve real-world problems. MS-CAS-45: Evaluate how automation in technology can create or replace jobs and change how people work.	HS-CAS-46: Analyze narratives about how diverse teams of people used computational thinking and technologies to solve problems. HS-CAS-47: Connect computing knowledge and skills acquired to students' personal goals and career aspirations.