TECHNOKids® CSTA Standards

Computer Science Standards

Correlation of TechnoKids Technology Projects by Grade to Computer Science Teacher Association Standards

Identifier	Level	Grades	Concept	Standard	Start	Whiz	Me	Tales
1A-CS-01	1A	K-2	Computing Systems	Select and operate appropriate software to perform a variety of tasks, and recognize that users have different needs and preferences for the technology they use.	●	●		●
1A-CS-02	1A	K-2	Computing Systems	Use appropriate terminology in identifying and describing the function of common physical components of computing systems (hardware).	●			
1A-CS-03	1A	K-2	Computing Systems	Describe basic hardware and software problems using accurate terminology.	●			
1A-NI-04	1A	K-2	Networks & the Internet	Explain what passwords are and why we use them, and use strong passwords to protect devices and information from unauthorized access.	●			
1A-DA-05	1A	K-2	Data & Analysis	Store, copy, search, retrieve, modify, and delete information using a computing device and define the information stored as data.			●	
1A-DA-06	1A	K-2	Data & Analysis	Collect and present the same data in various visual formats.			●	
1A-DA-07	1A	K-2	Data & Analysis	Identify and describe patterns in data visualizations, such as charts or graphs, to make predictions.			●	
1A-AP-08	1A	K-2	Algorithms & Programming	Model daily processes by creating and following algorithms (sets of step-by-step instructions) to complete tasks.		●		●
1A-AP-09	1A	K-2	Algorithms & Programming	Model the way programs store and manipulate data by using numbers or other symbols to represent information.		●		●
1A-AP-10	1A	K-2	Algorithms & Programming	Develop programs with sequences and simple loops, to express ideas or address a problem.		●		●
1A-AP-11	1A	K-2	Algorithms & Programming	Decompose (break down) the steps needed to solve a problem into a precise sequence of instructions.		●		●
1A-AP-12	1A	K-2	Algorithms & Programming	Develop plans that describe a program’s sequence of events, goals, and expected outcomes.		●		●
1A-AP-13	1A	K-2	Algorithms & Programming	Give attribution when using the ideas and creations of others while developing programs.			●	
1A-AP-14	1A	K-2	Algorithms & Programming	Debug (identify and fix) errors in an algorithm or program that includes sequences and simple loops.		●		●
1A-AP-15	1A	K-2	Algorithms & Programming	Using correct terminology, describe steps taken and choices made during the iterative process of program development.		●		●
1A-IC-16	1A	K-2	Impacts of Computing	Compare how people live and work before and after the implementation or adoption of new computing technology.	●			
1A-IC-17	1A	K-2	Impacts of Computing	Work respectfully and responsibly with others online.	●	●	●	●
1A-IC-18	1A	K-2	Impacts of Computing	Keep login information private, and log off of devices appropriately.	●			

Identifier	Level	Grades	Concept	Standard	Arcade	Race	Sales	Trivia	Turtle
1B-CS-01	1B	3-5	Computing Systems	Describe how internal and external parts of computing devices function to form a system.					
1B-CS-02	1B	3-5	Computing Systems	Model how computer hardware and software work together as a system to accomplish tasks.					
1B-CS-03	1B	3-5	Computing Systems	Determine potential solutions to solve simple hardware and software problems using common troubleshooting strategies.					
1B-NI-04	1B	3-5	Networks & the Internet	Model how information is broken down into smaller pieces, transmitted as packets through multiple devices over networks and the Internet, and reassembled at the destination.					
1B-NI-05	1B	3-5	Networks & the Internet	Discuss real-world cybersecurity problems and how personal information can be protected.	●	●			
1B-DA-06	1B	3-5	Data & Analysis	Organize and present collected data visually to highlight relationships and support a claim.				●	
1B-DA-07	1B	3-5	Data & Analysis	Use data to highlight or propose cause-and-effect relationships, predict outcomes, or communicate an idea.				●	
1B-AP-08	1B	3-5	Algorithms & Programming	Compare and refine multiple algorithms for the same task and determine which is the most appropriate.	●	●			●
1B-AP-09	1B	3-5	Algorithms & Programming	Create programs that use variables to store and modify data.	●	●			●
1B-AP-10	1B	3-5	Algorithms & Programming	Create programs that include sequences, events, loops, and conditionals.	●	●			●
1B-AP-11	1B	3-5	Algorithms & Programming	Decompose (break down) problems into smaller, manageable subproblems to facilitate the program development process.	●	●		●	●
1B-AP-12	1B	3-5	Algorithms & Programming	Modify, remix, or incorporate portions of an existing program into one's own work, to develop something new or add more advanced features.	●	●		●	●
1B-AP-13	1B	3-5	Algorithms & Programming	Use an iterative process to plan the development of a program by including others' perspectives and considering user preferences.	●	●		●	●
1B-AP-14	1B	3-5	Algorithms & Programming	Observe intellectual property rights and give appropriate attribution when creating or remixing programs.		●			
1B-AP-15	1B	3-5	Algorithms & Programming	Test and debug (identify and fix errors) a program or algorithm to ensure it runs as intended.	●	●		●	●
1B-AP-16	1B	3-5	Algorithms & Programming	Take on varying roles, with teacher guidance, when collaborating with peers during the design, implementation, and review stages of program development.	●	●		●	●
1B-AP-17	1B	3-5	Algorithms & Programming	Describe choices made during program development using code comments, presentations, and demonstrations.	●	●			●
1B-IC-18	1B	3-5	Impacts of Computing	Discuss computing technologies that have changed the world, and express how those technologies influence, and are influenced by, cultural practices.	●	●		●	●
1B-IC-19	1B	3-5	Impacts of Computing	Brainstorm ways to improve the accessibility and usability of technology products for the diverse needs and wants of users.	●	●		●	●
1B-IC-20	1B	3-5	Impacts of Computing	Seek diverse perspectives for the purpose of improving computational artifacts.	●	●		●	●
1B-IC-21	1B	3-5	Impacts of Computing	Use public domain or creative commons media, and refrain from copying or using material created by others without permission.		●		●	●

Identifier	Level	Grades	Concept	Standard	Code	Budget	HTML5	BotAI	Python	Ad
2-CS-01	2	6-8	Computing Systems	Recommend improvements to the design of computing devices, based on an analysis of how users interact with the devices.				●		
2-CS-02	2	6-8	Computing Systems	Design projects that combine hardware and software components to collect and exchange data.						
2-CS-03	2	6-8	Computing Systems	Systematically identify and fix problems with computing devices and their components.						
2-NI-04	2	6-8	Networks & the Internet	Model the role of protocols in transmitting data across networks and the Internet.			●			
2-NI-05	2	6-8	Networks & the Internet	Explain how physical and digital security measures protect electronic information.						
2-NI-06	2	6-8	Networks & the Internet	Apply multiple methods of encryption to model the secure transmission of information.						
2-DA-07	2	6-8	Data & Analysis	Represent data using multiple encoding schemes.		●				●
2-DA-08	2	6-8	Data & Analysis	Collect data using computational tools and transform the data to make it more useful and reliable.		●				●
2-DA-09	2	6-8	Data & Analysis	Refine computational models based on the data they have generated.	●	●		●	●	
2-AP-10	2	6-8	Algorithms & Programming	Use flowcharts and/or pseudocode to address complex problems as algorithms.	●			●	●	
2-AP-11	2	6-8	Algorithms & Programming	Create clearly named variables that represent different data types and perform operations on their values.	●			●	●	
2-AP-12	2	6-8	Algorithms & Programming	Design and iteratively develop programs that combine control structures, including nested loops and compound conditionals.	●			●	●	
2-AP-13	2	6-8	Algorithms & Programming	Decompose problems and subproblems into parts to facilitate the design, implementation, and review of programs.	●		●	●	●	
2-AP-14	2	6-8	Algorithms & Programming	Create procedures with parameters to organize code and make it easier to reuse.			●		●	
2-AP-15	2	6-8	Algorithms & Programming	Seek and incorporate feedback from team members and users to refine a solution that meets user needs.	●		●	●	●	
2-AP-16	2	6-8	Algorithms & Programming	Incorporate existing code, media, and libraries into original programs, and give attribution.	●		●	●		
2-AP-17	2	6-8	Algorithms & Programming	Systematically test and refine programs using a range of test cases.	●		●	●	●	
2-AP-18	2	6-8	Algorithms & Programming	Distribute tasks and maintain a project timeline when collaboratively developing computational artifacts.				●		
2-AP-19	2	6-8	Algorithms & Programming	Document programs in order to make them easier to follow, test, and debug.			●	●	●	
2-IC-20	2	6-8	Impacts of Computing	Compare tradeoffs associated with computing technologies that affect people's everyday activities and career options.	●		●	●		
2-IC-21	2	6-8	Impacts of Computing	Discuss issues of bias and accessibility in the design of existing technologies.	●		●	●	●	
2-IC-22	2	6-8	Impacts of Computing	Collaborate with many contributors through strategies such as crowdsourcing or surveys when creating a computational artifact.	●			●	●	●
2-IC-23	2	6-8	Impacts of Computing	Describe tradeoffs between allowing information to be public and keeping information private and secure.	●		●	●		●

Identifier	Level	Grades	Concept	Standard	Future AI	Ad	Chatbot AI
3A-CS-01	3A	9-10	Computing Systems	Explain how abstractions hide the underlying implementation details of computing systems embedded in everyday objects.	●		●
3A-CS-02	3A	9-10	Computing Systems	Compare levels of abstraction and interactions between application software, system software, and hardware layers.			
3A-CS-03	3A	9-10	Computing Systems	Develop guidelines that convey systematic troubleshooting strategies that others can use to identify and fix errors.	●		
3A-NI-04	3A	9-10	Networks & the Internet	Evaluate the scalability and reliability of networks, by describing the relationship between routers, switches, servers, topology, and addressing.			
3A-NI-05	3A	9-10	Networks & the Internet	Give examples to illustrate how sensitive data can be affected by malware and other attacks.	●		
3A-NI-06	3A	9-10	Networks & the Internet	Recommend security measures to address various scenarios based on factors such as efficiency, feasibility, and ethical impacts.	●		
3A-NI-07	3A	9-10	Networks & the Internet	Compare various security measures, considering tradeoffs between the usability and security of a computing system.		●	
3A-NI-08	3A	9-10	Networks & the Internet	Explain tradeoffs when selecting and implementing cybersecurity recommendations.	●		
3A-DA-09	3A	9-10	Data & Analysis	Translate between different bit representations of real-world phenomena, such as characters, numbers, and images.			
3A-DA-10	3A	9-10	Data & Analysis	Evaluate the tradeoffs in how data elements are organized and where data is stored.			
3A-DA-11	3A	9-10	Data & Analysis	Create interactive data visualizations using software tools to help others better understand real-world phenomena.	●		
3A-DA-12	3A	9-10	Data & Analysis	Create computational models that represent the relationships among different elements of data collected from a phenomenon or process.	●		
3A-AP-13	3A	9-10	Algorithms & Programming	Create prototypes that use algorithms to solve computational problems by leveraging prior student knowledge and personal interests.	●		●
3A-AP-14	3A	9-10	Algorithms & Programming	Use lists to simplify solutions, generalizing computational problems instead of repeatedly using simple variables.			●
3A-AP-15	3A	9-10	Algorithms & Programming	Justify the selection of specific control structures when tradeoffs involve implementation, readability, and program performance, and explain the benefits and drawbacks of choices made.			
3A-AP-16	3A	9-10	Algorithms & Programming	Design and iteratively develop computational artifacts for practical intent, personal expression, or to address a societal issue by using events to initiate instructions.	●		●
3A-AP-17	3A	9-10	Algorithms & Programming	Decompose problems into smaller components through systematic analysis, using constructs such as procedures, modules, and/or objects.	●		●
3A-AP-18	3A	9-10	Algorithms & Programming	Create artifacts by using procedures within a program, combinations of data and procedures, or independent but interrelated programs.	●		●
3A-AP-19	3A	9-10	Algorithms & Programming	Systematically design and develop programs for broad audiences by incorporating feedback from users.	●		●
3A-AP-20	3A	9-10	Algorithms & Programming	Evaluate licenses that limit or restrict use of computational artifacts when using resources such as libraries.	●		
3A-AP-21	3A	9-10	Algorithms & Programming	Evaluate and refine computational artifacts to make them more usable and accessible.	●		●
3A-AP-22	3A	9-10	Algorithms & Programming	Design and develop computational artifacts working in team roles using collaborative tools.	●		●

Identifier	Level	Grades	Concept	Standard	Future AI	Ad	Chatbot AI
3A-AP-23	3A	9-10	Algorithms & Programming	Document design decisions using text, graphics, presentations, and/or demonstrations in the development of complex programs.			
3A-IC-24	3A	9-10	Impacts of Computing	Evaluate the ways computing impacts personal, ethical, social, economic, and cultural practices.	●		●
3A-IC-25	3A	9-10	Impacts of Computing	Test and refine computational artifacts to reduce bias and equity deficits.	●		
3A-IC-26	3A	9-10	Impacts of Computing	Demonstrate ways a given algorithm applies to problems across disciplines.			●
3A-IC-27	3A	9-10	Impacts of Computing	Use tools and methods for collaboration on a project to increase connectivity of people in different cultures and career fields.	●		●
3A-IC-28	3A	9-10	Impacts of Computing	Explain the beneficial and harmful effects that intellectual property laws can have on innovation.	●		
3A-IC-29	3A	9-10	Impacts of Computing	Explain the privacy concerns related to the collection and generation of data through automated processes that may not be evident to users.	●		●
3A-IC-30	3A	9-10	Impacts of Computing	Evaluate the social and economic implications of privacy in the context of safety, law, or ethics.	●		
3B-CS-01	3B	11-12	Computing Systems	Categorize the roles of operating system software.			
3B-CS-02	3B	11-12	Computing Systems	Illustrate ways computing systems implement logic, input, and output through hardware components.			
3B-NI-03	3B	11-12	Networks & the Internet	Describe the issues that impact network functionality (e.g., bandwidth, load, delay, topology).			
3B-NI-04	3B	11-12	Networks & the Internet	Compare ways software developers protect devices and information from unauthorized access.	●		
3B-DA-05	3B	11-12	Data & Analysis	Use data analysis tools and techniques to identify patterns in data representing complex systems.			
3B-DA-06	3B	11-12	Data & Analysis	Select data collection tools and techniques to generate data sets that support a claim or communicate information.	●		
3B-DA-07	3B	11-12	Data & Analysis	Evaluate the ability of models and simulations to test and support the refinement of hypotheses.			
3B-AP-08	3B	11-12	Algorithms & Programming	Describe how artificial intelligence drives many software and physical systems.	●		●
3B-AP-09	3B	11-12	Algorithms & Programming	Implement an artificial intelligence algorithm to play a game against a human opponent or solve a problem.			●
3B-AP-10	3B	11-12	Algorithms & Programming	Use and adapt classic algorithms to solve computational problems.			
3B-AP-11	3B	11-12	Algorithms & Programming	Evaluate algorithms in terms of their efficiency, correctness, and clarity.			●
3B-AP-12	3B	11-12	Algorithms & Programming	Compare and contrast fundamental data structures and their uses.			
3B-AP-13	3B	11-12	Algorithms & Programming	Illustrate the flow of execution of a recursive algorithm.			
3B-AP-14	3B	11-12	Algorithms & Programming	Construct solutions to problems using student-created components, such as procedures, modules and/or objects.	●		

Identifier	Level	Grades	Concept	Standard	Future AI	Ad	Chatbot AI
3B-AP-15	3B	11-12	Algorithms & Programming	Analyze a large-scale computational problem and identify generalizable patterns that can be applied to a solution.			
3B-AP-16	3B	11-12	Algorithms & Programming	Demonstrate code reuse by creating programming solutions using libraries and APIs.			
3B-AP-17	3B	11-12	Algorithms & Programming	Plan and develop programs for broad audiences using a software life cycle process.			
3B-AP-18	3B	11-12	Algorithms & Programming	Explain security issues that might lead to compromised computer programs.	●		
3B-AP-19	3B	11-12	Algorithms & Programming	Develop programs for multiple computing platforms.			
3B-AP-20	3B	11-12	Algorithms & Programming	Use version control systems, integrated development environments (IDEs), and collaborative tools and practices (code documentation) in a group software project.			
3B-AP-21	3B	11-12	Algorithms & Programming	Develop and use a series of test cases to verify that a program performs according to its design specifications.	●		●
3B-AP-22	3B	11-12	Algorithms & Programming	Modify an existing program to add additional functionality and discuss intended and unintended implications (e.g., breaking other functionality).			●
3B-AP-23	3B	11-12	Algorithms & Programming	Evaluate key qualities of a program through a process such as a code review.			
3B-AP-24	3B	11-12	Algorithms & Programming	Compare multiple programming languages and discuss how their features make them suitable for solving different types of problems.			
3B-IC-25	3B	11-12	Impacts of Computing	Evaluate computational artifacts to maximize their beneficial effects and minimize harmful effects on society.	●		●
3B-IC-26	3B	11-12	Impacts of Computing	Evaluate the impact of equity, access, and influence on the distribution of computing resources in a global society.	●		
3B-IC-27	3B	11-12	Impacts of Computing	Predict how computational innovations that have revolutionized aspects of our culture might evolve.	●		
3B-IC-28	3B	11-12	Impacts of Computing	Debate laws and regulations that impact the development and use of software.	●		