

## K-2 Computer Science Teachers Association (CSTA) Computer Science Standards

Concept	Subconcept	Practice	Level 1A (Ages 5-7) By the end of Grade 2, students will be able to. . .	Coding Lessons	In-App Content	Challenge Cards	Curriculum Guide	
Computing Systems	Devices	P1.1	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.		●		●	
	Hardware & Software	P7.2	Use appropriate terminology in identifying and describing the function of common physical components of computing systems (hardware).	●				
	Troubleshooting	P6.2 P7.2	Describe basic hardware and software problems using accurate terminology.				●	
Networks & the Internet	Cybersecurity	P7.3	Explain what passwords are and why we use them, and use strong passwords to protect devices and information from unauthorized access.					
Data Analysis	Storage	P4.2	Store, copy, search, retrieve, modify, and delete information using a computing device and define the information stored as data.		●		●	
	Collection, Visualization & Transformation	P7.1 P4.4	Collect and present the same data in various visual formats.				●	
	Inference & Models	P4.1	Identify and describe patterns in data visualizations, such as charts or graphs, to make a prediction.				●	
Algorithms & Programming	Algorithms	P4.4	Model daily processes by creating and following algorithms (sets of step-by-step instructions) to complete tasks.	●				
	Variables	P4.4	Model the way programs store and manipulate data by using numbers or other symbols to represent information.	●	●	●	●	
	Control	P5.2	Develop programs with sequences and simple loops, to express ideas or address a problem.		●	●	●	
	Modularity	P3.2	Decompose (break down) the steps needed to solve a problem into a precise sequence of instructions.	●		●	●	
	Program Development		P5.1 P7.2	Develop a plan that describes a program's sequence of events, goals, and expected outcomes.	●		●	●
			P7.3	Give attribution when using the ideas and creations of others while developing programs.	●			●
			P6.2	Debug (identify and fix) errors in an algorithm or program that includes sequences and simple loops.		●	●	●
P7.2			Using correct terminology, describe steps taken and choices made during the iterative process of program development.	●			●	
Impacts of Computing	Culture	P7	Compare how computing technology has changed the way people live and work.	●				
	Social Interactions	P2.1	Work respectfully and responsibly with others online.					
	Safety, Law & Ethics	P7.3	Keep login information private, and log off of devices appropriately.					

## 3-5 Computer Science Teachers Association (CSTA) Computer Science Standards

Concept	Subconcept	Practice	Level 1B (Ages 8-11) By the end of Grade 5, students will be able to. . .	Coding Lessons	In-App Content	Challenge Cards	Curriculum Guide
Computing Systems	Devices	P7.2	Describe how internal and external parts of computing devices function to form a system.	●			
	Hardware & Software	P4.4	Model how computer hardware and software work together as a system to accomplish tasks.	●			
	Troubleshooting	P6.2	Determine potential solutions to solve simple hardware and software problems using common troubleshooting strategies.				●
Networks & the Internet	Network Communication & Organization	P4.4	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.				
	Cybersecurity	P3.1	Discuss real-world cybersecurity problems and how personal information can be protected.				
Data Analysis	Collection, Visualization & Transformation	P7.1	Organize and present collected data visually to highlight relationships and support a claim.	●			●
	Inference & Models	P7.1	Use data to highlight or propose cause-and-effect relationships, predict outcomes, or communicate an idea.	●			●
Algorithms & Programming	Algorithms	P6.3 P3.3	Compare and refine multiple algorithms for the same task and determine which is the most appropriate.			●	●
	Variables	P5.2	Create programs that use variables to store and modify data.		●	●	
	Control	P5.2	Create programs that include sequences, events, loops, and conditionals.		●	●	●
	Modularity	P3.2	Decompose (break down) problems into smaller, manageable sub-problems to facilitate the program development process.	●		●	●
		P5.3	Modify, remix or incorporate portions of an existing program into one's own work, to develop something new or add more advanced features.		●	●	
	Program Development	P1.1 P5.1	Use an iterative process to plan the development of a program by including other's perspectives and considering user preferences.	●		●	●
		P7.3	Observe intellectual property rights and give appropriate attribution when creating or remixing programs.				
		P6.1 P6.2	Test and debug (identify and fix errors) a program or algorithm to insure it runs as intended.		●	●	●
		P2.2	Take on varying roles, with teacher guidance, when collaborating with peers during the design, implementation and review stages of program development.	●		●	●
		P7.2	Describe choices made during program development via code comments, presentations, and demonstrations.	●			●

### 3-5 Computer Science Teachers Association (CSTA) Computer Science Standards (continued)

Concept	Subconcept	Practice	Level 1B (Ages 8-11) By the end of Grade 5, students will be able to. . .	Coding Lessons	In-App Content	Challenge Cards	Curriculum Guide
Impacts of Computing	Culture	P7.1	Discuss computing technologies that have changed the world and express how those technologies influence, and are influenced by, cultural practices.	●			
		P1.2	Brainstorm ways to improve the accessibility and usability of technology products for the diverse needs and wants of users.	●			
	Social Interactions	P1.1	Seek diverse perspectives for the purpose of improving computational artifacts.	●			●
	Safety, Law & Ethics	P7.3	Use public domain or creative commons media and refrain from copying or using material created by others without permission.				

# International Society for Technology in Education (ISTE) for Students

Standards		Coding Lessons	In-App Content	Challenge Cards	Curriculum Guide
Empowered Learner	Students leverage technology to take an active role in choosing, achieving and demonstrating competency in their learning goals, informed by the learning sciences. Students:				
	1a	articulate and set personal learning goals, develop strategies leveraging technology to achieve them and reflect on the learning process itself to improve learning outcomes.	●		
	1b	build networks and customize their learning environments in ways that support the learning process.	●		
	1c	use technology to seek feedback that informs and improves their practice and to demonstrate their learning in a variety of ways.			●
	1d	understand the fundamental concepts of technology operations, demonstrate the ability to choose, use and troubleshoot current technologies and are able to transfer their knowledge to explore emerging technologies.	●	●	●
Knowledge Constructor	Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts and make meaningful learning experiences for themselves and others. Students:				●
	3a	Use data to highlight or propose cause-and-effect relationships, predict outcomes, or communicate an idea.	●		●
	3b	evaluate the accuracy, perspective, credibility and relevance of information, media, data or other resources.			
	3c	curate information from digital resources using a variety of tools and methods to create collections of artifacts that demonstrate meaningful connections or conclusions.			●
	3d	build knowledge by actively exploring real-world issues and problems, developing ideas and theories and pursuing answers and solutions.	●		
Innovative Designer	Students use a variety of technologies within a design process to identify and solve problems by creating new, useful or imaginative solutions. Students:				
	4a	know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts or solving authentic problems.	●		●
	4b	select and use digital tools to plan and manage a design process that considers design constraints and calculated risks.	●		●
	4c	develop, test and refine prototypes as part of a cyclical design process.	●		●
	4d	exhibit a tolerance for ambiguity, perseverance and the capacity to work with open-ended problems.			●

## International Society for Technology in Education (ISTE) for Students (continued)

Standards		Coding Lessons	In-App Content	Challenge Cards	Curriculum Guide
Computational Thinker	Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions. Students:				
	5a formulate problem definitions suited for technology-assisted methods such as data analysis, abstract models and algorithmic thinking in exploring and finding solutions.	●			
	5b collect data or identify relevant data sets, use digital tools to analyze them, and represent data in various ways to facilitate problem-solving and decision-making.	●			●
	5c break problems into component parts, extract key information, and develop descriptive models to understand complex systems or facilitate problem-solving.			●	●
	5d understand how automation works and use algorithmic thinking to develop a sequence of steps to create and test automated solutions.	●	●	●	●
Creative Communicator	Students communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats and digital media appropriate to their goals. Students:				●
	6a choose the appropriate platforms and tools for meeting the desired objectives of their creation or communication.	●	●		●
	6b create original works or responsibly repurpose or remix digital resources into new creations.	●			
	6c communicate complex ideas clearly and effectively by creating or using a variety of digital objects such as visualizations, models or simulations.	●			●
	6d publish or present content that customizes the message and medium for their intended audiences.	●			●
Global Collaborator	Students use digital tools to broaden their perspectives and enrich their learning by collaborating with others and working effectively in teams locally and globally. Students:				
	7a use digital tools to connect with learners from a variety of backgrounds and cultures, engaging with them in ways that broaden mutual understanding and learning.	●			●
	7b use collaborative technologies to work with others, including peers, experts or community members, to examine issues and problems from multiple viewpoints.	●		●	●
	7c contribute constructively to project teams, assuming various roles and responsibilities to work effectively toward a common goal.	●		●	●
	7d explore local and global issues and use collaborative technologies to work with others to investigate solutions.	●			