

Georgia Standards of Excellence for K-8 Computer Science Third Draft

Georgia Standards of Excellence (GSE) for Computer Science (CS) were created in response to the growing ubiquity of computing devices and their impact on every aspect of society. If Georgia's students are to participate effectively in society, a shift in K-12 education must correspond. In Georgia, Computer Science is understood as the study of computers and algorithmic processes, including their principles, their hardware and software designs, their implementation, and their impact on society. The standards blend the core concepts of computer science (i.e., what students should know) and computer science practices (i.e., what students should do). These core concepts and practices should be taught in an integrated way to provide authentic learning experiences for students.

The GSE for Computer Science immerse students in the practices of Computer Science from Kindergarten through grade 12, effectively transitioning Computer Science from a high school elective to a comprehensive K-12 discipline for all students. Some skills or concepts are emphasized more in particular grade bands in conjunction with research on how students learn and other knowledge and skills taught at those levels. Any curriculum aligned to these GSE should revisit domains and concepts over time as students apply their learning by creating computational artifacts. Creating computational artifacts can be as simple as writing socially responsible electronic messages (e.g., email and social media posts) and as complex as designing an app for a drone or a self driving vehicle.

The standards are organized in grade bands rather than grade levels to afford schools flexibility in presenting the content while maintaining a structured, developmental progression from one band to another. Teachers can scaffold instruction from simple familiarization in the K-2 grade band to deeper involvement in the 3-5 and more thorough treatment in the 6-8 grade band. In addition, the 6-8 grade band standards are designed to feed directly into the high school CS pathways which are, in turn, designed to meet the dynamic needs of industry and post-secondary study of computer science.

Georgia-owned and Georgia-grown, the GSE for Computer Science relate broadly to national and international frameworks. The grade bands follow the structure set forth by the [K12 CS Framework](#); they develop a comprehensive conceptual framework that grows over the years. The K-8 GSE for Computer Science also correspond to the [ISTE standards for students](#) as organizational domains. These domains are intended to be cross-curricular. The ISTE domains (e.g. Empowered Learner) define a high-level perspective on the characteristics of a 21st century student. These characteristics are couched in a digital society but are not restricted to computer science content. Likewise, the GSE for Computer Science can be integrated into other content areas and support enduring characteristics for learning (e.g., collaborative, communicative, creative, and critical thinking). Ultimately, the GSE for Computer Science support and inspire Georgia's students as they grow and learn, empowering students to be successful, responsible, and engaged citizens.

Georgia Standards of Excellence for K-8 Computer Science Third Draft

Competency: Definable skill or fundamental understanding; overarching understanding

Standard: Specific application or representation of a competency; expectations of what should be taught and learned

Ex.

Cluster 6-8 Empowered Learner

CSS.EL.6-8.1

Use technology resources to increase self-direction and self-regulation in learning, including for problem solving and collaboration (e.g., using the Internet to access online resources, edit documents collaboratively)

1. Understand the difference between editing a shared document and suggesting edits (e.g. track changes)
2. Use digital tools or platforms to organize, display, annotate, and/or share a curated collection
3. Complete an individual project (e.g., research or design) using technology resources

CSS = Computer Science Standard

EL = Empowered Learner (Domain)

6-8 = Grade band 6 through 8

1 = is the standard number

1... = Element of the standard

Georgia Standards of Excellence for K-8 Computer Science Third Draft

Grade Cluster: K-2

Empowered Learner

CSS.EL.K-2.1

Recognize that technology provides the opportunity to enhance relevance, increase confidence, offer authentic choice, and produce positive impacts in learning.

Knowledge Constructor

CSS.KC.K-2.2

Use digital tools to construct knowledge, produce creative artifacts, and make meaningful learning experiences for themselves and others.

1. Recognize the letters, numbers, and basic functions of a keyboard, touchpad/trackpad, mouse, and other input devices.
2. Use the letters, numbers, and basic functions of the keyboard effectively (shift, space, tab, enter/return).
3. Identify and use the home row of the keyboard to use the keyboard effectively.
4. Build (use, modify and/or create) collections of digital images and words to communicate learning using a variety of media types.
5. Analyze collections for how well each collection communicates learning.
6. Identify a problem of interest to the learner and create a solution using digital tools.

Digital Citizen

CSS.DC.K-2.3

Recognize the rights, responsibilities, and opportunities of living, learning and working in an interconnected digital world by acting and modeling in ways that are safe, legal and ethical.

1. Identify personal information, understand the need to keep it private, and engage in activities keeping personal information private.
2. Participate in systems for keeping personal information private and protected (passwords, biometric sensors, etc)
3. Understand shared information on the Internet can be permanent.
4. Recognize and avoid harmful behaviors in online environments.
5. Follow safety rules and exhibit responsibility when using a device.
6. Create an artifact that shows use of a positive safe behavior when using technology.
7. Recognize work that is created by others.
8. Recognize that credit is given for the work of others found online.
9. Create an artifact that demonstrates a personal positive digital identity.

Georgia Standards of Excellence for K-8 Computer Science Third Draft

Innovative Designer and Creator

CSS.IDC.K-2.4

Use a variety of digital tools within a design process (use, modify, create) to identify and solve problems by creating new, modified, or imaginative solutions.

1. Understand that a model is used for developing and testing ideas for a diverse range of users
2. Modify an existing model for a specific purpose or for a specific group of users.
3. Create and test a model and analyze it from the perspective of an end user.
4. Recognize that innovation in technology meets a range of needs (3D printing, coding, robotics, drones, etc.)
5. Understand that innovation follows a process such as system life cycle, engineering design (use, modify, create) or design thinking (empathize, define, ideate, prototype and test).

Computational Thinker

CSS.CT.K-2.5

Develop and employ strategies to use data and understand and solve problems by using computational thinking concepts to develop and test solutions across disciplines.

1. Decompose problems: Recognize that problems within a context can be broken down into smaller parts. (Context: Real-world problems that affect you, your classroom, and your community.)
2. Pattern-matching: Recognize patterns within data to simplify and make sense of the data. (Context: Real-world problems that affect you, your classroom, and your community)
3. Algorithmic Thinking: Select, sequence and create an algorithm to complete a task.
4. Construct algorithms (set of step-by-step instructions) either independently or collaboratively, including
 - a) sequencing (including ordinal numbers) and;
 - b) simple loops (patterns and repetition).
5. Construct programs to accomplish tasks as a means of creative expression using a block-based programming language or unplugged activities, either independently or collaboratively including:
 - a) sequencing, ordinal numbers; and
 - b) simple loops (patterns and repetition)
6. Abstraction: Recognize that solutions to problems can be applied to more than one context. (Context: Real-world problems that affect you, your classroom, and your community.)
7. Identify multiple ways to apply a single algorithm.
8. Analyze and debug (correct and improve) an algorithm with or without a computing device.

Georgia Standards of Excellence for K-8 Computer Science Third Draft

Creative Communicator

CSS.CC.K-2.6

Communicate clearly and express ideas creatively for a variety of purposes using digital tools and media appropriate to learning goals.

1. Exchange information or ideas clearly and creatively to create or remix using a variety of digital tools.
2. Create a variety of artifacts (puzzle, game solution, digital image)
3. Exchange information or ideas clearly and creatively using digital tools while considering audience and intended purpose.
4. Creates artifacts for specific purposes that gives and receives feedback.

Global Collaborator

CSS.GC.K-2.7

Use digital tools to broaden perspectives and enrich learning by collaborating with others and working effectively in teams locally and globally.

1. Recognize and experience technology that allows collaboration with others around the world.
2. 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.
3. Understand features of online environments and the potential to work with others.
4. Contribute constructively to project teams, assuming various roles and responsibilities to work effectively toward a common goal and create an inclusive culture.
5. Participates in an online collaborative learning environment.

Reflective Researcher

CSS.RR.K-2.8

Select appropriate sources to conduct authentic research to produce a relevant and credible product.

1. Understand that answers to questions can be found through research from a variety of sources.
2. Understand that resources on the Internet vary in quality and are found in a variety of places so care is needed in selection.
3. Understand there is an appropriate place to find information to research the answer to a question.
4. Select the most accurate, relevant, and credible resources, digital and analog.
5. Progress from using a teacher-curated list of resources, to selecting resources independently, and showing analysis and justification of what makes a source accurate, relevant, and credible.
6. Collect and organize data.
7. Create a product of research collaboratively or independently. (e.g., table, writing assignment, collection of resources)
8. Create and share a research project reflecting and crediting a variety of quality resources.

Georgia Standards of Excellence for K-8 Computer Science
Third Draft

Digital Awareness

CSS.DA.K-2.9

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.

1. Understand that technology is everywhere and changes our lives.
2. Understand that there is a connection between people and devices
3. Practice using and identifying basic hardware and software using accurate terminology.
4. Create simple artifacts using a computing device
5. Recognize innovation in technology is a major change agent
6. Understand that when you are on a device you are connected to other people
7. Practice using a variety of computing hardware and software to achieve personal learning goals
8. Identify and describe solutions to simple hardware and software problems (ex. volume control)
9. Analyze how technology impacts their life positively and negatively
10. Use devices appropriately with the understanding that there is a connection between people and devices
11. Choose and use appropriate hardware and software tools for a given purpose using accurate terminology