

## 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.

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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

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### Cluster 3-5

#### Empowered Learner

##### CSS.EL.3-5.1

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. Describe how internal and external parts of computing devices function to form a system.
2. Model how computer hardware and software work together as a system to accomplish tasks.
3. Determine potential solutions to solve simple hardware and software problems using common troubleshooting strategies.
4. Develop and apply keyboarding skills, utilizing current technology.
5. Develop, reflect on, and revise personal learning goals in collaboration with their peers.

#### Knowledge Constructor

##### CSS.KC.3-5.2

Critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts and make meaningful learning experiences for themselves and others.

1. Curate information from digital resources using a variety of tools and methods to create collections of artifacts that demonstrate meaningful connections or conclusions.
2. Build knowledge by actively exploring real-world issues and problems, developing ideas and theories.
3. Organize and present collected data visually to highlight relationships and support a claim.

#### Digital Citizen

##### CSS.DC.3-5.3

Recognize the rights, responsibilities, and opportunities of living, learning, and working in an interconnected digital world, and they act and model in ways that are safe, legal and ethical.

1. Discuss real-world cybersecurity problems and how personal information can be protected.
2. Understand, demonstrate, and encourage respect for intellectual property of print and digital media.
3. Create and manage digital identity through positive, safe, and ethical online interactions.

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### **Innovative Designer and Creator**

#### **CSS.IDC.3-5.4**

Use a variety of technologies within a design process to identify and solve problems by creating new, useful, or imaginative solutions.

1. Explore and practice a deliberate design process for generating ideas, testing theories, creating innovative artifacts, or solving authentic problems.
2. Select, evaluate, and use appropriate digital tools to plan and manage a design process.
3. Modify, remix, or incorporate portions of an existing program into one's own work, to develop something new or add more advanced features.

### **Computational Thinker**

#### **CSS.CT.3-5.5**

Develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions.

1. Compare and refine multiple algorithms for the same task and determine which is the most appropriate.
2. Decompose (break down) problems into smaller, manageable subproblems to facilitate the program development process.
3. Test and debug (identify and fix errors) a program or algorithm to ensure it runs as intended.
4. Create programs that include sequences, events, loops, conditionals, and variables.

### **Creative Communicator**

#### **CSS.CC.3-5.6**

Communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats and digital media appropriate to their goals.

1. Create original works or responsibly repurpose or remix digital resources into new creations.
2. Communicate complex ideas clearly and effectively by creating or using a variety of digital objects.
3. Publish or present content that customizes the message and medium for their intended audiences.

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### **Global Collaborator**

#### **CSS.GC.3-5.7**

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

1. Explore local and global issues using digital tools to connect with learners from a variety of backgrounds and cultures
2. Plan the development of a program by including others' perspectives and considering user preferences.
3. Take on varying roles, with teacher guidance, when collaborating with peers during the design, implementation, and review stages of program development.
4. Describe choices made during program development using code comments, presentations, and demonstrations.
5. Seek diverse perspectives for the purpose of improving computational artifacts.

### **Reflective Researcher**

#### **CSS.RR.3-5.8**

Gather, evaluate, and organize quality information from multiple sources, especially in connection with real-world problems and solutions.

1. Understand and use effective research strategies to locate information and other resources.
2. Evaluate the accuracy, perspective, credibility and relevance of information, media, data, or other resources.

### **Digital Awareness**

#### **CSS.DA.3-5.9**

Understand the relationship between technology, lifelong learning, and stewardship of information.

1. Discuss computing technologies that have changed the world, and express how those technologies influence, and are influenced by, cultural practices.
2. Identify and propose ways to improve usability of technology for diverse users