



CSTA STANDARDS FOR CS TEACHERS

< CS Instructional Practice Evidence Guide >

This CS Instructional Practice Evidence Guide is a tool for observing and reflecting upon the quality of computer science (CS) instructional practice, as aligned to the [Standards for CS Teachers](#). Teachers, coaches, and instructional leaders may use this tool to support the ongoing development of CS teachers through evidence-based, standards-aligned conversations about CS instruction.

The following teacher and student actions delineate effective teaching and learning of K-12 computer science. However, one should not expect to see all, or even the majority of, these actions at any given time. Rather, they can be used collectively as a framework to define indicators of quality teaching and learning. They can also be used modularly to isolate specific areas of focus, based on teachers' individualized development goals.



Standard 1. CS Knowledge and Skills: Effective CS teachers demonstrate and continuously develop thorough knowledge of CS content. They demonstrate proficiency with the CS concepts of the grade bands they teach, and they integrate these concepts with CS practices, including computational thinking. They also understand the progression of content before and after the grade bands they teach. The current content expectations are maintained in student standards aligned to the *K-12 CS Framework*.

Teacher Actions

- ☐ Models computational thinking, including how to abstract and represent problems and to iteratively create and test solutions (e.g., “code-alongs”): 1a
- ☐ Teaches and reinforces use of appropriate CS vocabulary: 1b, 1c, 1d, 1e, 1f, 4b
- ☐ Supports students' thoughtful and powerful use of data within other subject areas: 1d
- ☐ Models iterative, systematic testing of solutions to ensure criteria and constraints are met: 1a, 4e
- ☐ Models and prompts effective documentation of computational processes and projects: 1e, 5e
- ☐ Demonstrates how to attribute credit appropriately: 1e, 1a, 5e
- ☐ Sparks and facilitates conversation around responsible and ethical computing: 1f

Student Actions

- ☐ Learn CS content through doing and creating rather than only reading or listening: 1e, 4e, 5c
- ☐ Test and refine computational solutions: 1a, 1e
- ☐ Proactively anticipate and identify potential errors (e.g., debugging strategies, decomposing problems into manageable chunks): 1a, 5c
- ☐ Demonstrate understanding of computing systems and their components: 1b
- ☐ Explain how computers communicate with each other through networks: 1c
- ☐ Use data thoughtfully: 1d
- ☐ Explore the positive/neutral/negative impacts of computing on society and vice-versa: 1f
- ☐ Connect history and current events to CS: 1f
- ☐ Employ self- and peer-advocacy to address bias in interactions, product design, and development methods: 1f, 1e, 4c, 5b
- ☐ Articulate ideas responsibly by observing intellectual property rights and giving appropriate attribution: 1e, 1a, 5e

Evidence:



Standard 2. Equity and Inclusion: Effective CS teachers proactively advocate for equity and inclusion in the CS classroom. They work towards an intentional, equity-focused vision to improve access, engagement, and achievement for all of their students in CS.

Teacher Actions

- ❑ Incorporates diverse perspectives and experiences in curricular materials and instruction: 2c
- ❑ Monitors student engagement and participation; amplifies varied perspectives and approaches; and disrupts patterns of inequity: 2d, 5b

Student Actions

- ❑ Actively participate and engage in content, including special populations (e.g., students with disabilities, English learners): 2c, 2d, 3d
- ❑ Use accessible materials and accessibility features (e.g., text-to-speech options and captioned videos) as needed: 2e, 4a
- ❑ Address the needs of diverse end users during the design process to produce artifacts with broad accessibility and usability: 2c, 1e

Evidence:



Standard 4. Instructional Design: Effective CS teachers design learning experiences that engage students in problem solving and creative expression through CS, using pedagogical content knowledge (PCK). They plan to meet the varied learning, cultural, linguistic, and motivational needs of individual students in order to build student self-efficacy and capacity in CS.

Teacher Actions

- ❑ Integrates all five core concepts into CS planning, instruction, and assessment: 4b
- ❑ Uses multiple ways to represent content, including relevant analogies and illustrations: 4c, 4f
- ❑ Provides a variety of means to express ideas and engage in content: 4c
- ❑ Differentiates lessons while maintaining comparable content and level of rigor: 3d, 4c, 4f
- ❑ Scaffolds project creation using models like use-modify-create: 4e, 4f
- ❑ Supports students in making meaningful connections between CS concepts and their personal experiences and interests: 4e, 4f
- ❑ Explicitly teaches design patterns (e.g., subgoal labeling) and debugging strategies: 4f
- ❑ Proactively addresses misconceptions: 4f
- ❑ Facilitates learning with a variety of modalities (e.g., programming and unplugged activities): 4f
- ❑ Adjusts instruction using ongoing formative assessment: 4g

Student Actions

- ❑ Continuously predict, plan, connect, and reflect to deepen their conceptual understanding: 4f, 5a
- ❑ Engage in differentiated learning activities: 4c
- ❑ Create projects that integrate and extend their knowledge of CS and other subjects: 4d, 1d, 4b
- ❑ Create or “remix” projects that are novel and personally meaningful, and share to authentic audiences: 4e, 5e, 1b, 1e

Evidence:



Standard 5. Classroom Practice: Effective CS teachers are responsive classroom practitioners who implement evidence-based pedagogy to facilitate meaningful experiences and produce empowered learners of CS.

Teacher Actions

- ☐ Uses questions and inquiry to guide learning: 5a
- ☐ Provides individualized, in-time instruction and feedback to guide students in mastering content while creating projects: 5f, 5c, 4e
- ☐ Develops students' ability to persevere at points of difficulty by leveraging strategies and resources: 5c, 1a, 3b
- ☐ Promote student self-efficacy by facilitating student creativity, choice in product and process, and self-directed learning: 5c
- ☐ Explicitly introduces and reinforces norms for collaborating: 5d, 4f
- ☐ Provides scaffolds and feedback to support students' productive discourse aligned to lesson objectives: 5e, 4f, 5f, 4b
- ☐ Develops students' ability to interpret and use feedback from computers, teachers, peers, and community: 5f
- ☐ Models metacognitive strategies when confronted with challenges: 5c, 4f

Student Actions

- ☐ Ask thoughtful questions to guide learning: 5a
- ☐ Set goals and monitor progress through self-reflection, assessment, and feedback: 5c, 5f
- ☐ Share personal experiences, and invite others' perspectives to the discussion: 5b
- ☐ Seek out varied perspectives, abilities, approaches, and solutions: 5b
- ☐ Show confidence in their learning of CS as they are supported at their individual levels: 5c
- ☐ Use resources, forums, and peers as ways to seek help and extend learning: 5c, 5d, 5f
- ☐ Adopt structured roles and responsibilities within collaborative projects: 5d, 4e
- ☐ Utilize pair programming: 5d
- ☐ Solicit, evaluate, and incorporate constructive feedback from peers and other stakeholders: 5f
- ☐ Discuss, read, and write about CS content: 5e
- ☐ Describe, justify, and document computational processes and projects (e.g., using pseudocode, comments in code): 5e
- ☐ Use appropriate academic language consistent with the intended audience and purpose: 5e, 4b

Evidence:



Standard 3. Professional Growth and Identity: Effective CS teachers continuously develop their knowledge, practice, and professional identity to keep pace with the rapidly evolving discipline. They participate in the larger CS education community and collaborate with others to develop the skills that enable all students to succeed in their classes.

Teacher Actions

- ☐ Models continuous learning of CS content: 3b
- ☐ Use language that reinforces all students are capable of succeeding in CS: 3d
- ☐ Models continuous learning and collaboration

Evidence:

(e.g., showcases own projects): 3b, 3e, 3f