TENNESSEE STEM
COMPUTER SCIENCE
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TN Department of Education

Computer Science

Reach Them All

Computer Science & Computational Thinking

Integration Guidebook p.10

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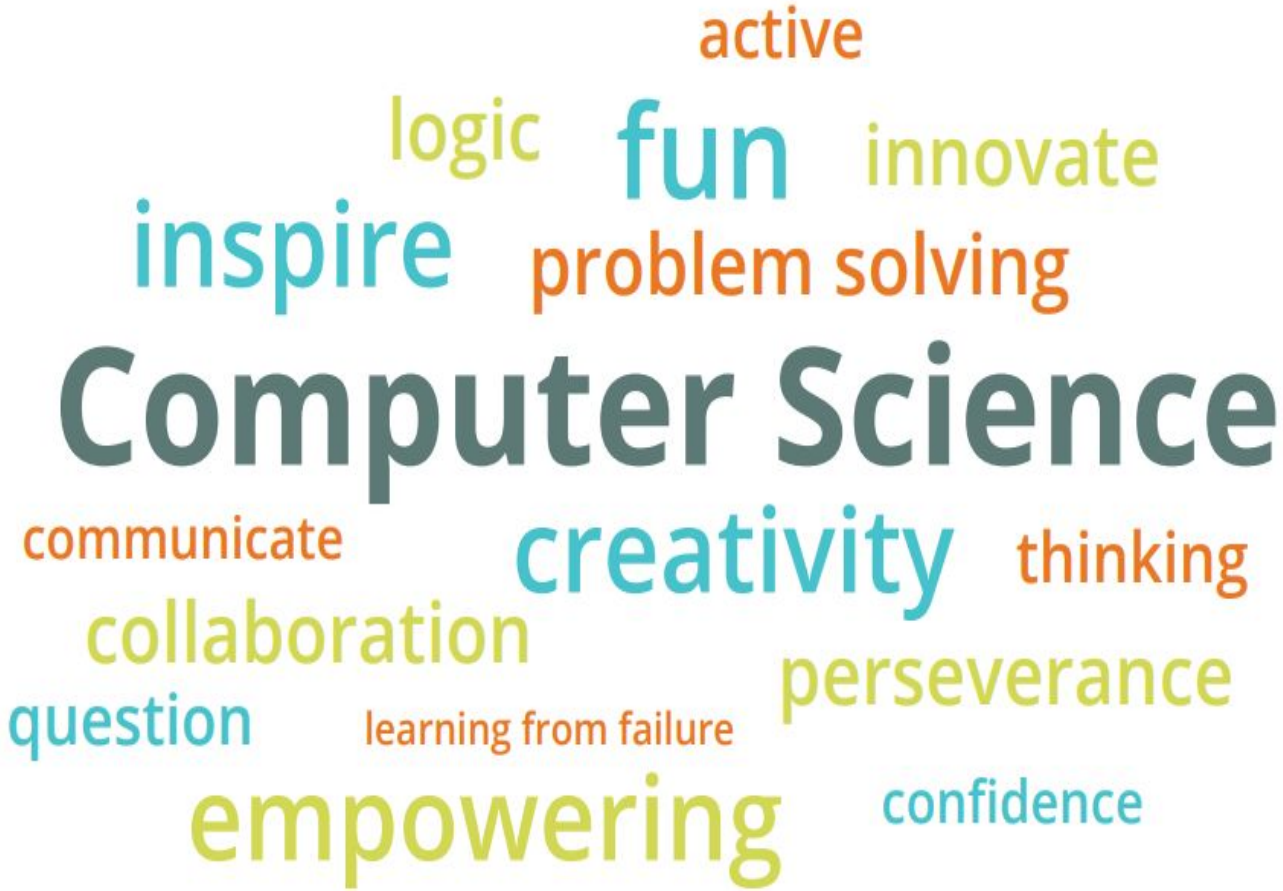
Computer Science is NOT...

- technology integration.
- being a 1:1 school.
- just using a computing device.
- limited to only writing code or programs.

Computer Science is…

" the study of computers and algorithmic processes, including their principles, their hardware and software designs, their implementation, and their impact on society."

- Association of Computing Machinery



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Helping Students Persevere Video (5 min)

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Computer Science is...

- A **creative endeavor** that combines a variety of skills with the power of computing.
  - Logical reasoning
  - Collaboration
  - Problem solving
  - Designing with empathy
  - Communication of ideas
  - Critical thinking

- Computer science education allows students to move beyond being passive users of computing devices to **engaged** and **innovative** computer science **thinkers**.

Computer Science is Changing Everything

https://youtu.be/QvyTEx1wyOY (5.53 min)

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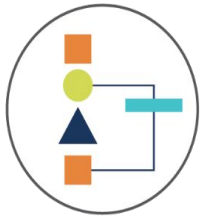
Computational Thinking is...

- a **strategic thought process** of skills and practices fundamental to computer science.
- something **all K-12 students** can learn.
- can be applied across **many content areas**.
- an **entry point for teachers** to learn how to integrate computer science concepts into their current curriculum.


COMPUTATIONAL THINKING
CORE CONTENT SUBJECTS
COMPUTER SCIENCE
tsin Tennessee STEM Innovation Network
TN Department of Education

Computational Thinking

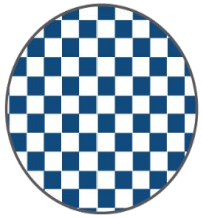


ALGORITHM

Step by step instructions

PATTERN RECOGNITION

Identifying similarities or patterns across a problem when evaluating data

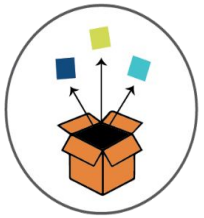


DECOMPOSITION

Break a problem into smaller, more manageable parts

ABSTRACTION

Focus on the important information and remove unnecessary details



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What is Computational Thinking?

https://youtu.be/GJKzkVZcozc (5.37 min)

Computational Thinking
CSTA/ISTE Definition

- **Formulating problems** in a way that enables us to use a computer and other tools to help solve them.
- Logically **organizing and analyzing data.**
- Representing data through **abstractions** such as models and simulations.
- Automating solutions through **algorithmic thinking.**

Computational Thinking CSTA/ISTE Definition

- Identifying, analyzing, and implementing possible solutions with the goal of achieving the most **efficient** and **effective** combination of steps and resources.

- Generalizing and transferring this **problem- solving process** to a wide variety of problems.

Computer Science Integration

Integration Guidebook p.13

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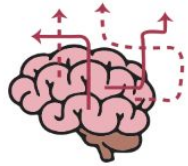
Why Integration?

- The focus on integration will create a framework to ensure the state teaching force has the capacity, disposition, and sustainability to provide accessible and high-quality computer science education.

- All teachers can actively play a part in supporting the momentum of computer science education in the state of Tennessee.

- Content teachers can weave computational thinking and computer science practices into their daily lessons.

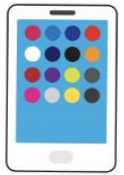
2023-2024 Goals for Computer Science Integration



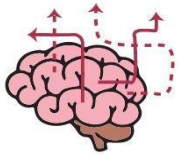
1. Teachers develop a foundational understanding of computational thinking and computer science concepts.

2. Teachers discover connections between what they teach, and computational thinking and computer science concepts. Teachers use these connections to integrate computational thinking and computer science concepts into their curriculum.

3. Teachers cultivate a mindset that expects all students to participate in computational thinking and computer science.



2023-2024 Goals for Computer Science Integration



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Integration in Action Video

Integration in Action

https://youtu.be/RIw34Bscwhs (2.18 min)

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