

K-12 Learning Standards in NYS for Computer Science

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In the **Zoom** Chat...

Question #1

**What Learning Standards do
you teach to?**

Question #2

**Guess how many CS Teachers
are in New York, K-12?**



Computer Science and Digital Fluency Learning Standards

- January 2020, the NYS Board of Regents Conditionally Approved*: K-12 Computer Science Learning Standards

"Every student will know how to live productively and safely in a technology-dominated world. This includes understanding the essential features of digital technologies, why and how they work, and how to communicate and create using those technologies."



Digital Literacy & Digital Fluency

- *“In recent years, digital fluency has emerged as a term to describe the ‘next level’ of understanding and skill beyond digital literacy. More than just the knowledge and skill to use digital technologies, digital fluency implies an ability to evaluate technologies, transfer understanding to move fluidly between technologies, and create something new with technology.”*
- *“As there are areas where computer science and digital literacy overlap, a mastery of both areas is necessary to be considered digitally fluent.”*



tinyurl.com/nys-draft-cs

Please download or open in a new
window.





Timeline

- April 2018 - NY Legislation mandates standards
- Sept 2018 - 'Meeting of Experts' set guidelines and merge with 'Digital Literacy'
- Oct 2018 - Call for Volunteer Authors
- Dec 2018-Feb 2019 - Authoring Committees
- Oct-Nov 2019 - Public Comments on Draft Standards



Contributors

2018 – 2020 Computer Science and Digital Fluency Standards Workgroups



- Over 800 Public Contributions
 - Teachers, Students, Administrators, Parents, Higher Ed, Industry Professionals, etc

<http://www.nysed.gov/curriculum-instruction/computer-science-and-digital-fluency-learning-standards>



Guiding Principles

- Equity & Access
- Interdisciplinary Connections
- Coherence
- Relevance and Engagement

- Revision 'Lens'
 - Clarity, Coherence, Equity, Interdisciplinary, Rigor, Relevant, Specificity



Organization of the Standards

- 4 Grade Bands
 - K-2, 3-5, 6-8, 9-12
- ~35 Standards Per Grade Band
- Standards are in 5 Main Concept Areas
 - **Impacts of Computing** (7)
 - Computational Thinking (12)
 - **Networks & System Design** (5)
 - **Cybersecurity** (5)
 - **Digital Literacy** (6)



Standards Tables

- Colored Header for the Concept Area
 - **Impacts of Computing**, Computational Thinking, **Networks & System Design**, **Cybersecurity**, **Digital Literacy**
- Grade Band Columns
 - K-2, 3-5, 6-8, 9-12
- Standard Identifier
 - Example: **3-5.CY.4**
- Standard vs Clarifying Statement vs Example
- Progressive Arrangement



Example: 6-8.CY.4

- Concept: **Cybersecurity**
- Subconcept: SAFEGUARDS
- Grade Band: 6-8
- Standard Identifier: 6-8.CY.4
- Standard
- Clarifying Statement
- Example

6-8
6-8.CY.4 Describe the limitations of cryptographic methods.
Clarifying Statement: The focus is on recognizing that cryptography provides a level of security for data, and some types of encryption are weaker than others.
For Example: Students could do a basic frequency analysis of a message encrypted with a Caesar Shift to determine how easy it would be to break it.



Cybersecurity Subconcepts

- **Risks**

- *Risk is a combination of a vulnerability, the likelihood that the vulnerability will be exploited, and the severity of consequences if the vulnerability is exploited. It is important to understand why data and resources need to be protected and how they might be compromised so the correct safeguards can be put into place.*

- .CY.1



Cybersecurity Subconcepts

- **Safeguards**

- *Programmers and individuals must know how to protect their data and computing resources with common safety measures. When combined, various physical, digital, and behavioral precautions can create a level of digital security.*

- __.CY.2 __.CY.3 __.CY.4



Cybersecurity Subconcepts

- **Response**
 - *When a security breach occurs, individuals must decide what actions to take. This takes into account what type of breach occurred and how to improve security moving forward.*
- __.CY.5



In the Zoom Chat...

Question #3

In the standards, find a cybersecurity vocabulary word that a presenter has used during the workshop so far. Report the 'Standard Identifier'



Implementation

- ***ALL*** Students in K-12 NY Public Schools
- Can be 'Unplugged' for K-2, 3-5, and some 6-8
- Interdisciplinary Connections
- Not necessarily in 'Computer Science Electives'



Roll-Out Timeline

Timetable for Roll-out and Implementation

Dates	Phase	Activities
Final Approval – Aug. 2021	Awareness-Building	Roll-out and building awareness of the new standards and timeline for implementation
Sept. 2021 – Aug. 2023	Capacity-Building	Focus on curriculum development, resource acquisition, professional development
Sept. 2023 – Aug. 2024	Year 1 Implementation	All credit-bearing Computer Science courses will be aligned with NYS CS&DF Standards
September 2024	Full Implementation	CS&DF Standards implemented in all grade bands K-12



Cyber Security Lesson Plan

Lesson Title:
Grade Level:

Summary:

Learning Objectives/Outcomes, Upon completion student will be able to:

Learning Types: Presentation, Project, Writing Assignment, Observation, Oral Questioning, Other

How will you facilitate learning? Warm up activity, focused activity closure, reflection?

Materials List:

Accommodations:

Description of Activity:



Resources

- Western NY CSTA: westernny.csteachers.org
- <https://sites.google.com/view/csteachersny>
- <https://code.org/yourschool>
- <https://www.csteachers.org>
- <http://www.nysed.gov/curriculum-instruction/computer-science-and-digital-fluency-learning-standards>