New York Computer Science & Digital Fluency

Grades 9-12

IMPACTS OF COMPUTING

Society

1 Evaluate the impact of computing technologies on equity, access, and influence in a global society. 9-12.IC.1

2 Debate laws and regulations that impact the development and use of computing technologies and digital information. 9-12.IC.2

Ethics

3 Debate issues of ethics related to real-world computing technologies. 9-12.IC.3

4 Assess personal and societal trade-offs related to computing technologies and data privacy. 9-12.IC.4

5 Describe ways that complex computer systems can be designed for inclusivity and to mitigate unintended consequences. 9-12.IC.5

Accessibility

6 Create accessible computational artifacts that meet standard compliance requirements or otherwise meet the needs of users with disabilities. 9-12.IC.6

Career Paths

7 Investigate the use of computer science in multiple fields. 9-12.IC.7

Computational Thinking

Modeling and Simulation

1 Create a simple digital model that makes predictions of outcomes. 9-12.CT.1

Data Analysis and Visualization

2 Collect and evaluate data from multiple sources for use in a computational artifact. 9-12.CT.2

3 Refine and visualize complex data sets to tell different stories with the same data set. 9-12.CT.3

Abstraction and Decomposition

4 Implement a program using a combination of student-defined and third-party functions to organize the computation. 9-12.CT.4

5 Modify a function or procedure in a program to perform its computation in a different way over the same inputs, while preserving the result of the overall program. 9-12.CT.5

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Algorithms and Programming

6 Demonstrate how at least two classic algorithms work, and analyze the trade-offs related to two or more algorithms for completing the same task. 9-12.CT.6

7 Design or remix a program that utilizes a data structure to maintain changes to related pieces of data. 9-12.CT.7

8 Develop a program that effectively uses control structures in order to create a computer program for practical intent, personal expression, or to address a societal issue. 9-12.CT.8

9 Systematically test and refine programs using a range of test cases, based on anticipating common errors and user behavior. 9-12.CT.9

Networks and Systems Design

Hardware and Software

1 Design a solution to a problem that utilizes embedded systems to automatically gather input from the environment. 9-12.NSD.1

2 Explain the levels of interaction existing between the application software, system software, and hardware of a computing system. 9-12.NSD.2

3 Develop and communicate multistep troubleshooting strategies others can use to identify and fix problems with computing devices and their components. 9-12.NSD.3

Networks and the Internet

4 Describe the components and design characteristics that allow data and information to be moved, stored, and referenced over the internet. 9-12.NSD.4

5 Describe how emerging technologies are impacting networks and how they are used. 9-12.NSD.5

Cybersecurity

Risks

1 Determine the types of personal and organizational information and digital resources that an individual may have access to that need to be protected. 9-12.CY.1

Safeguards

2 Describe physical, digital, and behavioral safeguards that can be employed to protect the confidentiality, integrity, and accessibility of information. 9-12.CY.2

3 Explain specific trade-offs when selecting and implementing security recommendations. 9-12.CY.3

4 Evaluate applications of cryptographic methods. 9-12.CY.4

Response

5 Recommend multiple actions to take prior and in response to various types of digital security breaches. 9-12.CY.5

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Digital Literacy

Digital Use

1. Type proficiently on a keyboard. 9-12.DL.1
2. Communicate and work collaboratively with others using digital tools to support individual learning and contribute to the learning of others. 9-12.DL.2
3. Independently select advanced digital tools and resources to create, revise, and publish complex digital artifacts or collection of artifacts. 9-12.DL.4
4. Transfer knowledge of technology in order to use new and emerging technologies on multiple platforms. 9-12.DL.5

Digital Citizenship

5. Actively manage digital presence and footprint to reflect an understanding of the permanence and potential consequences of actions in online spaces. 9-12.DL.6
6. Design and implement strategies that support safety and security of digital information, personal identity, property, and physical and mental health when operating in the digital world. 9-12.DL.7