

Introduction to Computer Science

Computer Science

- a** Students create an understanding of computer science and explore how it impacts their everyday lives. 483.D1.1

- b** Create a definition of computer science and computational thinking. 4803.D1.2

- c** Demonstrate awareness of the history of computing. 4803.D1.3

- d** Investigate trends in computer science and their impact on society. 4803.D1.4

- e** Summarize ethical issues within computer science. 4803.D1.5

Programming and Development

- a** Students connect the process of developing a computing artifact (ex. computer application, web application, operating system, artificial intelligence) with the skills needed during the development process to have a better understanding of what it takes to build a computing artifact. 4803.D2.1

- b** Use the design process to iteratively develop a computing artifact. 4803.D2.2

- c** Demonstrate competencies of programming constructs, including use of data types and variables, control structures (sequencing, looping, branching), and modularity (such as a function). 4803.D2.3

- d** Understand how abstractions hide implementation details when used in everyday objects. 4803.D2.4

- e** Use abstraction to manage program complexity (such as a function to create callable code). 4803.D2.5

- f** Formulate algorithms using programming structures to decompose a complex problem. 4803.D2.6

- g** Assess a program by testing to verify correct behavior. 4803.D2.7

- h** Construct a computing artifact that has a user interface. 4803.D2.8

- i** Produce an artifact that includes rich media. 4803.D2.9

- j** Illustrate knowledge of good programming practice including the use of conventional standards and comments. 4803.D2.10

Data

- a** Students describe the types of data and how it is created, stored, and used by computers. 4803.D3.1

- b** Understand how computers represent data, including: text, sound, images, and numbers. 4803.D3.2

- c** Create data visualizations, models, and simulations. 4803.D3.3

- d** Evaluate data to better understand the world. 4803.D3.4

- e** Explore the relationship between information and data. 4803.D3.5

Computers, Devices, and Other Technologies

- a** Students analyze computer devices and other technologies to build an understanding of their impact on society and how to use them appropriately. 4803.D4.1

- b** Demonstrate understanding of the hardware and operating systems of computers. 4803.D4.2

- c** Discuss the ethical and appropriate use of computer devices. 4803.D4.3

- d** Explore the fundamental principles and components of computer networking. 4803.D4.4

- e** Examine the impact of the Internet on society. 4803.D4.5

- f** Investigate the use of artificial intelligence by individuals and society. 4803.D4.6

- g** Investigate innovations in computing, including robotics. 4803.D4.7

Collaboration

- a** Students collaborate to complete various tasks. 4803.D5.1

- b** Design a solution to a problem by working in a team. 4803.D5.2

- c** Explore technologies that can be used to collaborate with others of various cultures and career fields. 4803.D5.3

- d** Utilize a problem-solving approach to develop a solution using technology. 4803.D5.4

- e** Analyze the work of peers and provide feedback. 4803.D5.5

- f** Program a solution to a problem using pair programming or other methods. 4803.D5.6

Security and Privacy

- a** Examine the dynamic between privacy and security. 4803.D6.1

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- b Explain the privacy concerns related to the collection and generation of data through implicit and explicit processes.** 4803.D6.2

 - c Evaluate the social and emotional implications of privacy in the context of safety, law, and ethics.** 4803.D6.3

 - d Give examples to illustrate how sensitive data can be affected by malware and other attacks.** 4803.D6.4

 - e Recommend security measures to address various scenarios based on factors such as efficiency, feasibility, and ethical implications.** 4803.D6.5

 - f Discuss the laws surrounding intellectual property.** 4803.D6.6
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Careers

- a Students will investigate various careers within the field of computer science.** 4803.D7.1

- b Identify computer science occupations and the roles and responsibilities of each.** 4803.D7.2

- c Report job outlook, demand, and projected wages for computer science careers.** 4803.D7.3

- d Explore the job opportunities that are available in computer science.** 4803.D7.4

- e Investigate post-secondary training opportunities and industry certifications that are available.** 4803.D7.5