

Grade 8

Computational Thinker

Abstraction

- 1 Design a function using a programming language that demonstrates abstraction. Example: Create a program that utilizes functions in an effort remove repetitive sequences of steps. 8.1
- 2 Explain how abstraction is used in a given function. Example: Examine a set of block-based code and explain how abstraction was used. 8.2

Algorithms

- 3 Create an algorithm using a programming language that includes the use of sequencing, selections, or iterations. Example: Use a block-based or script programming language Step 1: Start Step 2: Declare variables a, b and c. Step 3: Read variables a, b and c. Step 4: If a>b If a>c Display a is the largest number. Else Display c is the largest number. Else If b>c Display b is the largest number. Else Display c is the greatest number. Step 5: Stop 8.3
- 4 Create a function to simplify a task. Example: (3) $8 = 3 \times 3 \times 3 \times 3 \times 3 \times 3 \times 3$; = (Average) used in a spreadsheet to average a given list of grades. 8.4

Programming and Development

- 5 Discuss the efficiency of an algorithm or technology used to solve complex problems. 8.5
- 6 Describe how algorithmic processes and automation increase efficiency. 8.6
- 7 Create a program that includes selection, iteration, or abstraction, and initializes, and updates, at least two variables. Examples: Make a game, interactive card, story, or adventure game. 8.7

Citizen of a Digital Culture

Safety, Privacy, and Security

- 8 Compare and contrast common methods of securing data. 8.8
- 9 Secure a file or other data. Examples: lock spreadsheet cell(s), password protect, encrypt. 8.9

Legal and Ethical Behavior

- 10 Analyze different modes of social engineering and their effectiveness. Examples: Phishing, hoaxes, impersonation, baiting, spoofing. 8.10
- 11 Advocate for positive, safe, legal, and ethical habits when creating and sharing digital content. Example: Students create a brochure that highlights the consequences of illegally downloading media. 8.11

Digital Identity

- 12 Cite evidence of the positive and negative effects of data permanence on personal and professional digital identity. 8.12

Impact of Computing

- 13 Evaluate the impact of digital globalization on public perception and ways Internet censorship can affect free and equitable access to information. 8.13
- 14 Analyze current events related to computing and their effects on education, the workplace, individuals, communities, and global society. 8.14
- 15 Critique computational artifacts, including options for accessibility for all users, with respect to the needs of a global culture. 8.15

Global Collaborator

Creative Communications

- 16 Present content designed for specific audiences through an appropriate medium. Example: Create and share a help video for a senior's center that provides tips for online safety. 8.16
- 17 Communicate and publish individually or collaboratively to persuade peers, experts, or community about issues and problems. 8.17

Digital Tools

- 18 Type 40 words per minute with 95% accuracy using appropriate keyboarding techniques. 8.18

Social Interactions

- 19 Critique the impacts of censorship as it impacts global society. Example: Create a presentation outlining the social implications of limiting access to web content by favoring or blocking particular products or websites. 8.19
 - 20 Examine an artifact that demonstrates bias through distorting, exaggerating, or misrepresenting data and redesign it using factual, relevant, unbiased content to more accurately reflect the truth. 8.20
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Computing Analyst

Data

- 21 Differentiate types of data storage and apply most efficient structure. Examples: Stack, array, queue, table, database. 8.21
 - 22 Encrypt and decrypt various data. Example: Create and decipher a message sent in a secret code. 8.22
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Systems

- 23 Design a digital artifact to propose a solution for a content-related problem. Example: Create a presentation outlining how to create a cost-efficient method to melt snow on roads during the winter. 8.23
 - 24 Compare and contrast common methods of cybersecurity. Example: Discuss how password protections and encryption are similar and different. 8.24
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Modeling and Simulation

- 25 Create a model that represents a system. Example: Food chain, supply and demand. 8.25
 - 26 Create a simulation that tests a specific model. Examples: Demonstrate that pressure changes with temperature in a controlled environment; demonstrate that rocket design affects the height of a rocket's launch; demonstrate that the amount of water changes the height of a plant. 8.26
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Innovative Designer

Human/Computer Partnerships

- 27 Analyze assistive technologies and how they improve the quality of life for users. Example: Research multiple speech to text technologies and write a persuasive essay in favor of one over another. 8.27
 - 28 Develop a logical argument for and against artificial intelligence. Examples: Students debate the use of artificial intelligence in self-driving vehicles. Students write a persuasive essay to argue for or against digital personal assistants. 8.28
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Design Thinking

- 29 Create an artifact to solve a problem using ideation and iteration in the problem-solving process. Examples: Create a public service announcement or design a computer program, game, or application. 8.29