Alabama Digital Literacy and Computer Science

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*3*3*3*3*3*3*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

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

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

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

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

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