

Grades 9-12

Computational Thinking [DLCS25.HS.CT](#)

AAD Algorithms, Abstraction, and Decomposition [DLCS25.HS.CT.AAD](#)

- 1 Compare and contrast a generalized algorithm in pseudocode and its concrete implementation in a programming language. [DLCS25.HS.1](#)
- 2 Translate pseudocode, flowcharts, or other planning tools into multiple programming languages. [DLCS25.HS.2](#)
- 3 Explain the characteristics of algorithms, including speed, accuracy, and storage requirements. [DLCS25.HS.3](#)
- 4 Model and adapt classic algorithms, including sorting and searching, to solve computational problems. [DLCS25.HS.4](#)
- 5 Decompose problems into component parts, extract key information, and model levels of abstraction in complex systems. [DLCS25.HS.5](#)
- 6 Compare different data compression algorithms by analyzing their main features, including their compression speed and whether they preserve data exactly (lossless) or reduce data quality for higher compression (lossy). [DLCS25.HS.6](#)
- 7 Create software solutions using libraries and application programming interfaces (APIs) that demonstrate code reuse. [DLCS25.HS.7](#)
- 8 Compare and contrast the major categories of machine learning, including supervised, unsupervised, and reinforcement learning. [AI] [DLCS25.HS.8](#)

P Programming [DLCS25.HS.CT.P](#)

- 9 Compare and contrast fundamental data structures and their uses. [DLCS25.HS.9](#)
 - 10 Develop and use a series of test cases to verify that a program performs according to its design specifications. [DLCS25.HS.10](#)
 - 11 Utilize an iterative and incremental software design process, including learning from mistakes, to improve a program. [DLCS25.HS.11](#)
 - 12 Improve existing code by restructuring (refactoring) it to enhance readability and/or increase efficiency without changing its overall behavior. [DLCS25.HS.12](#)
 - 13 Select and utilize effective debugging techniques to correct problems in software. [DLCS25.HS.13](#)
 - 14 Create a complete program to solve a problem or explore personal interests, using a text-based programming language. [DLCS25.HS.14](#)
 - 15 Design and implement a program that processes user input, applies relational and logical operators within conditional logic, maintains program state, and produces appropriate responses. [DLCS25.HS.15](#)
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**Data
Science** [DLCS25.HS.DS](#)

DCR Data Collection and Representation [DLCS25.HS.DS.DCR](#)

- 16 Create interactive data visualizations to help others understand real-world phenomena. [AI] [DLCS25.HS.16](#)
 - 17 Verify the validity of a dataset by identifying missing, out-of-range, inconsistent, or invalid data and distinguishing these from statistical outliers using basic measures such as range, mean, or standard deviation. [DLCS25.HS.17](#)
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DA Data Analysis [DLCS25.HS.DS.DA](#)

- 18 Correct or remove entries containing missing, out-of-range, inconsistent, or invalid data from a dataset to prepare it for analysis. [DLCS25.HS.18](#)
 - 19 Utilize data analysis tools and statistical methods on a dataset to discover useful information, identify patterns, or make an informed decision. [DLCS25.HS.19](#)
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MS Modeling and Simulation [DLCS25.HS.DS.MS](#)

- 20 Create and utilize models and simulations to help formulate, test, and refine a hypothesis. [DLCS25.HS.20](#)
 - 21 Update an existing model to address flaws and improve precision. [DLCS25.HS.21](#)
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**Computing
Systems** [DLCS25.HS.CS](#)

NI Networks and Internet [DLCS25.HS.CS.NI](#)

- 22 Analyze how network infrastructure impacts the speed, reliability, and scalability of services. [DLCS25.HS.22](#)
 - 23 Explain how security protocols in networked systems protect or expose data and assess the risks associated with IoT devices and cloud services. [DLCS25.HS.23](#)
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C Cybersecurity [DLCS25.HS.CS.C](#)

- 24 Explain the tradeoffs when selecting and implementing cybersecurity recommendations, balancing cost, performance, usability, and security. [DLCS25.HS.24](#)
 - 25 Summarize the mechanisms and purposes of various tracking technologies and identify strategies to manage them. [DLCS25.HS.25](#)
 - 26 Investigate the purpose of and relationship among various computer security measures. [DLCS25.HS.26](#)
 - 27 Create a personal cybersecurity plan incorporating the CIA Triad *(confidentiality, integrity, and availability)* to safeguard sensitive information and ensure its trustworthiness and accessibility. [DLCS25.HS.27](#)
 - 28 Investigate the motivations behind hacking and examine the associated ethical considerations. [DLCS25.HS.28](#)
 - 29 Appraise the trustworthiness of new or unfamiliar resources in order to make safe choices when downloading, installing, and using software. [DLCS25.HS.29](#)
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HS Hardware and Software [DLCS25.HS.CS.HS](#)

- 30 Compare alternative computing architectures, including cluster and quantum computing, to classical computing systems. [DLCS25.HS.30](#)
 - 31 Explain the interactions between application software, operating systems, drivers, and hardware. [DLCS25.HS.31](#)
 - 32 Compare and contrast the common metadata elements of various file types. [DLCS25.HS.32](#)
 - 33 Develop and implement troubleshooting strategies to identify and correct problems with computing devices. [DLCS25.HS.33](#)
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Impact of Computing [DLCS25.HS.IC](#)

CP Career Paths [DLCS25.HS.IC.CP](#)

- 34 Research and explain the impact of computing technology on career pathways across different industries and career fields. [DLCS25.HS.34](#)
 - 35 Research and share information regarding current AI applications in various career fields. [AI] [DLCS25.HS.35](#)
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E Ethics [DLCS25.HS.IC.E](#)

- 36 Analyze the implications of data privacy and consent for making informed decisions about personal data security. [DLCS25.HS.36](#)
 - 37 Identify and evaluate the consequences of technology-related laws and policies, including those addressing privacy, accessibility, and intellectual property. [DLCS25.HS.37](#)
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S Society [DLCS25.HS.IC.S](#)

- 38 Analyze the ethical issues related to AI technologies and evaluate their societal and ecological impacts. [AI] [DLCS25.HS.38](#)
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ET Emerging Technology [DLCS25.HS.IC.ET](#)

- 39 Predict the transformative effects of hypothetical future technologies. [AI] [DLCS25.HS.39](#)
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A Accessibility [DLCS25.HS.IC.A](#)

- 40 Follow Americans with Disabilities Act (ADA) standards to design digital artifacts that reduce barriers caused by the digital divide, disability, or bias. [DLCS25.HS.40](#)
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Digital Proficiency [DLCS25.HS.DP](#)

IL Information Literacy [DLCS25.HS.DP.IL](#)

- 41 Research and report potential dangers and unintended consequences of over-reliance on AI tools. [AI] [DLCS25.HS.41](#)
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DL Digital Life [DLCS25.HS.DP.DL](#)

- 42 Explain how systems learn user preferences and behaviors to deliver personalized content and targeted advertisements. [AI] [DLCS25.HS.42](#)

- 43 Investigate the mental health risks associated with excessive technology use, including social isolation, anxiety, and depression, and develop strategies to mitigate them. **DLCS25.HS.43**
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DT Digital Tools **DLCS25.HS.DP.DT**

- 44 Evaluate the usability of software applications for broad audiences by considering feedback from real-world users. **DLCS25.HS.44**
- 45 Identify a problem best solved through human-machine collaboration, decomposing it into tasks suited for each. **DLCS25.HS.45**