

Essentials of Technology

COMPUTING SYSTEMS **CS**

- 1 Examine how hardware and software contribute to computing devices solving relevant problems. **CS.1****
 - 1 Define key computing terms. **CS.1.1**
 - 2 Identify and define the key functional components (e.g., input devices, output devices, processor, operating system, software system, software applications, memory, storage). **CS.1.2**
 - 3 Explain Moore's Law. **CS.1.3**
 - 4 Compare and contrast operation systems (e.g., Mac, Windows, Chrome Android, iOS **CS.1.4**
 - 5 Analyze the progression of computing and impact on society (e.g., real-world setting such as traffic lights, medical devices, facial recognition). **CS.1.5**
 - 6 Investigate how a problem is systematically solved through the selection and integration of hardware and software components. **CS.1.6**

NETWORKS AND THE INTERNET **NI**

- 1 Evaluate data transmission across networks, including the internet. **NI.1****
 - 1 Describe how hardware, software, and protocols work together for transmitting data across networks. **NI.1.1**
 - 2 Describe how a picture, sound/song, and video are digitized and represented in a computer. **NI.1.2**
- 2 Evaluate cybersecurity threats and appropriate security measures across networks. **NI.2****
 - 1 Reflect on case studies or current events in which governments or organizations experienced data leaks or data loss as a result of cybersecurity attacks. **NI.2.1**
 - 2 Evaluate how sensitive data can be affected by malware and other attacks (e.g., denial-of- service attacks, ransomware, viruses, worms, spyware, phishing). **NI.2.2**

DATA AND ANALYSIS **DA**

- 1 Evaluate various data collection methods, data storage tools, data analysis tools, data representation tools, and bit representation. **DA.1****
- 2 Construct a computational model using data sets of a real-world phenomenon. **DA.2****
 - 1 Describe the various data collection methods, data analysis tools, and data representation tools. **DA.2.1**
 - 2 Describe the various data storage tools and data organization methods. **DA.2.2**

- 3 Describe a data set that could be used to explore a real-world phenomenon or support a claim. **DA.2.3**
 - 4 Create a data set that could be used to explore a real-world phenomenon or support a claim. **DA.2.4**
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3 Create various ways to visually represent data. DA.3

- 1 Identify a data set that could be used to solve a real-world problem. **DA.3.1**
 - 2 Construct a data visualization to solve a real-world problem using software tools (e.g., bar graph, line charts). **DA.3.2**
 - 3 Analyze patterns in a data visualization then share information with a group of people. **DA.3.3**
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**IMPACT OF
COMPUTING IC**

1 Evaluate the impact of computing from a global perspective. IC.1

- 1 Compare and contrast the five disciplines of computing: computer science, software engineering, information technology, information systems, and computer engineering. **IC.1.1**
 - 2 Compare and contrast careers in computing along with education requirements, training requirements, industry certifications, and salary range. **IC.1.2**
 - 3 Research careers related to post-secondary goals that may have global impact. **IC.1.3**
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2 Evaluate the legal and ethical tradeoffs that shape computing practices. IC.2

- 1 Discuss legal issues and consequences related to copyright laws, fair use laws, intellectual property, and ethics pertaining to downloading of images, photographs, documents, video, sounds, music, trademarks, for personal use. **IC.2.1**
 - 2 Explain the importance of Acceptable Use Policies. **IC.2.2**
 - 3 Select the most appropriate means of communication for given situations (e.g., personal versus professional communication, communication with employers). **IC.2.3**
 - 4 Discuss how social media and computing devices have positively and negatively impacted communication. **IC.2.4**
 - 5 Discuss issues related to personal security (e.g., personal, financial, professional). **IC.2.5**
 - 6 Explain the implications of proper and improper use of social media (e.g., technical college admissions, employment, hacking, cyberbullying). **IC.2.6**
 - 7 Explain the use of encryption and how it is used on a daily basis. **IC.2.7**
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**ALGORITHMS AND
PROGRAMMING AP**

1 Design algorithms that can be adapted to express an idea or solve a problem. AP.1

- 1 Create flowcharts and/or pseudocode to express a problem or idea as an algorithm. **AP.1.1**

2 Build a combination of control structures that supports complex execution, readability, and program performance. [AP.2](#)

- 1 Trace the flow of execution of a program that uses a combination of control structures (e.g., conditionals, loops, event handlers, recursion). [AP.2.1](#)