

Foundations of Secure Information Systems Curriculum Map – Elliott Neumeister, Murphey Middle School, 2023-08-07

Middle School Computer Science courses are 9 weeks long per the curriculum, but Murphey uses an A Day – B Day system.   
As a result, my estimated times assume a total course duration of 18 weeks.

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| **Grade Bands: 6-8** | **Unit 1** | **Unit 2** | **Unit 3** | **Unit 4** | **Unit 5** |
| **Instructional Segment:** | Employability Skills and Typing | Intro to Programming: Hedy Levels 1-10 | Intermediate Programming: Hedy Levels 11-16 | Computer Components and Networks | Cybersecurity, Privacy, and Ethics |
| **Estimated Time:** | 3 weeks and throughout the year | 4 weeks | 3 weeks | 4 weeks | 4 weeks |
| **Core Concepts/ Vocabulary:** | Etiquette – Practicing behaviors and speech patterns that are appropriate for business and other professional environments.  Time Management – strategies to meet deadlines, prioritize tasks, and avoid procrastination.  WPM – words per minute; a measure of typing speed. | Code – a series of instructions that are executed by a computer to solve a problem or accomplish a task.  Variable – a letter or word that stands in for another value. Frequently used for storing and recalling data in programming.  List – an ordered set of related values that can be used to store and organize data.  Conditional – an if/then statement that allows programs to behave differently based on input. | Algorithm – a procedure for solving a problem, like the steps in a recipe.  Loop – a statement that allows you to perform repetitive tasks without having to manually write each instance.  Comparison – a character like <, >, or == used to check if one value is less than, greater than, or equal to another value.  Python – a real-world programming language used by professionals in a variety of fields, from computer science to biology and physics. | Hardware – physical devices that make up computers, like CPU, RAM, hard drive, monitor, mouse and keyboard.  Software – programs that run on hardware, like Windows, macOS, Microsoft Office, and Google Chrome.  Network medium – the material that a computer network is made of, like copper wires, radio waves, or satellite connections.  OSI model – a networking model containing multiple interacting layers made of both hardware and software. | Physical security – security outside of the computer realm, like door locks, access keys, and restricted areas.  Encryption – techniques to scramble data and make it unreadable to unauthorized viewers.  Ethical hacking – using knowledge of computer system vulnerabilities to improve security and prevent unauthorized intrusions.  Cyberbullying – insults, harassment, and other bullying behavior that takes place online, on social networking sites, in texts and personal messages, etc. |
| **GaDOE Standards:** | * **MS-CS-FSIS-1** Demonstrate employability skills required by business and industry. * 1.1 Communicate effectively through writing, speaking, listening, reading, and interpersonal abilities. * 1.2 Demonstrate creativity by asking challenging questions and applying innovative procedures and methods. * 1.3 Exhibit critical thinking and problem-solving skills to locate, analyze and apply information in career planning and employment situations. * 1.4 Model work readiness traits required for success in the workplace including integrity, honesty, accountability, punctuality, time management, and respect for diversity. * 1.5 Apply the appropriate skill sets to be productive in a changing, technological, diverse workplace to be able to work independently and apply teamwork skills. * 1.6 Present a professional image through appearance, behavior, and language. * **MS-CS-FSIS-3** Develop through application logical observations relative to computational thinking procedures to analyze and solve problems current to everyday life. * 3.5 Explain how technology can create ethical and legal issues in the business world and a technology-based society and how it can be used to solve & manage those issues. | * **MS-CS-FSIS-2** Investigate and identify the basic components of computers and networks. * 2.6 Demonstrate an understanding of the fundamental concepts for how computers process programming commands (hex, binary language, sequence of commands, conditional structures, and looping structures). * **MS-CS-FSIS-3** Develop through application logical observations relative to computational thinking procedures to analyze and solve problems current to everyday life. * 3.1 Identify characteristics of computational thinking (decomposition, pattern recognition, algorithmic thinking, and abstraction). * 3.2 Explain issues and analyze routine hardware and software problems current to everyday life. * 3.3 Apply troubleshooting concepts to issues regarding compatibility, data, and identity. | * **MS-CS-FSIS-2** Investigate and identify the basic components of computers and networks. * 2.6 Demonstrate an understanding of the fundamental concepts for how computers process programming commands (hex, binary language, sequence of commands, conditional structures, and looping structures). * **MS-CS-FSIS-3** Develop through application logical observations relative to computational thinking procedures to analyze and solve problems current to everyday life. * 3.1 Identify characteristics of computational thinking (decomposition, pattern recognition, algorithmic thinking, and abstraction). * 3.2 Explain issues and analyze routine hardware and software problems current to everyday life. * 3.3 Apply troubleshooting concepts to issues regarding compatibility, data, and identity. | * **MS-CS-FSIS-2** Investigate and identify the basic components of computers and networks. * 2.1 Identify the basic components of the computer by disassembling and reassembling a demonstration model personal computer (can be done ‘virtually’ online if demo model is not available). * 2.2 Demonstrate an understanding of key functional components (input devices, output devices, processor, operating system, software applications, memory, storage, Wi-Fi and/or Ethernet ports, and IP addresses). * 2.3 Demonstrate an understanding of the terms and units used to describe major hardware components (e.g., RAM, ROM, GHz, MHz, GB, MB, CD, DVD, RW). * 2.4 Explain the interrelation of the operating system software, application software, and utility software, citing specific examples of each. * 2.5 Develop a basic vocabulary of networks including the Internet, wired, wireless, cellular, Wi-Fi, messages, packets, connections, bandwidth, broadband, firewall, hacking, cybersecurity, encryption, local area network (LAN), wide area network (WAN), and OSI model. * **MS-CS-FSIS-3** * Develop through application logical observations relative to computational thinking procedures to analyze and solve problems current to everyday life. * 3.1 Identify characteristics of computational thinking (decomposition, pattern recognition, algorithmic thinking, and abstraction). * 3.2 Explain issues and analyze routine hardware and software problems current to everyday life. * 3.3 Apply troubleshooting concepts to issues regarding compatibility, data, and identity. * 3.4 Describe ways to solve operational problems caused by hardware errors. * **MS-CS-FSIS-5** Evaluate and provide a rationale for the levels of the Open Systems Interconnection (OSI) model. * 5.1 Summarize from multiple credible sources the physical and digital aspects of computing networks. * 5.2 Trace the layers required to transmit data from one node to another (the OSI model). * 5.3 Construct and explain the basic functions of the OSI model. | * **MS-CS-FSIS-6** Examine the basics of cybersecurity needs for business, government, and organizations. * 6.1 List and define the elements of the confidentiality, integrity, and availability (CIA) triad. * 6.2 Explain components of access control: Identification, Authentication, Authorization, Accountability, and Non-repudiation. * 6.3 Identify the characteristics of strong vs. weak passwords in data and identity security. * 6.4 List and describe the basic steps in security risk management. * 6.5 Develop a logical argument for the importance of physical security. * **MS-CS-FSIS-7** Cite evidence regarding the principles of cybersecurity and basic mechanisms used for protecting data and resources. * 7.1 Define the cybersecurity first principles of least privilege, minimization, abstraction, domain separation, process isolation, information hiding, layering, simplicity, modularity, and resource encapsulation. * 7.2 Apply concepts related to the principles behind encryption, including the purpose of cryptography, hashing, and steganography. * 7.3 Draw conclusions illustrating a basic understanding of internet protocol (IP) packets, ports and network transmission. * 7.4 Summarize from multiple credible sources a basic understanding of anti-malware, firewalls, intrusion detection system/intrusion prevention system (IDS/IPS), and virtual private network (VPN). * **MS-CS-FSIS-8** Analyze and describe the characteristics of cybersecurity ethics, digital citizenship, and laws governing privacy. * 8.1 Explain the differences between an ethical (white hat) hacker and an unethical (black hat) hacker. * 8.2 Cite evidence regarding the practice of ethical digital decision-making, including plagiarism, copyright law, and software licensing types (freeware, public domain, shareware, etc.). * 8.3 Summarize and provide examples regarding security and privacy laws and their impact on society, citing recent cases. * 8.4 Collect and compare cyberbullying evidence, including legal and social consequences, and develop guidelines to prevent cyberbullying. * 8.5 Develop an argument regarding network security, citing policy-driven and technology-driven examples. |