Unit 1 Orientation, Digital Citizenship, and Keyboarding *1*

1.1 Identify school policies, program policies, and safety procedures related to cyber foundations II. *1.1*

a Examine the school handbook, the acceptable-use policy for technology, and other safety procedures for building-level situations. *1.1a*

b Preview the course outline and its relevance in today's workforce. *1.1b*

c Recognize appropriate safety measures related to technology in the computer lab and online safety. *1.1c*

1.2 Investigate social and ethical issues related to digital citizenship. *1.2*

a Privacy and security: Identify strategies for managing online information and keeping it secure from online risks. *1.2a*

b Creative credit and copyright: Identify user responsibilities and rights for creative credit, copyright, fair use, plagiarism and piracy. *1.2b*

c Digital footprint: Discuss ways to protect user privacy and respect others' privacy. *1.2c*

d Information Literacy: Evaluate the quality, credibility, and validity of websites and give proper credit. *1.2d*

e Cyberbullying: Explore the behaviors of cyberbullying and how it impacts individuals and communities and discuss the consequences. *1.2e*

f Internet safety: Identify strategies to determine inappropriate contact and positive connections when collaborating online. *1.2f*

g Self-image and identity: Explore digital lives by focusing on students' online and offline identities and the risks of presenting themselves through different personas. *1.2g*

h Relationships and communication: Explore different types of communication and online etiquette for different audiences *1.2h*

1.3 Collaborate with teachers, peers, and course materials using a learning management system *1.3*

a Discover online learning environments and how they operate among teachers and students. Demonstrate proper email etiquette. c. Participate in online learning methods, such as discussion boards, student journals, blogs, wikis, and so forth. *1.3a*

b Demonstrate proper email etiquette. Participate in online learning methods, such as discussion boards, student journals, blogs, wikis, and so forth. *1.3b*

c Participate in online learning methods, such as discussion boards, student journals, blogs, wikis, and so forth. *1.3c*

1.4 Demonstrate understanding of basic keyboarding information and perform keyboarding applications. *1.4*

a Define vocabulary associated keyboarding. *1.4a*

b Demonstrate understanding of keyboarding and workspace ergonomics through proper hand, finger, and body position when using a keyboard (ongoing). *1.4b*

c Perform touch typing by keying words, sentences, and paragraphs (ongoing). *1.4c*

d Demonstrate speed and accuracy with the touch keyboard (ongoing) *1.4d*

1.5 Investigate career opportunities within the law, public safety, corrections, and security career cluster. *1.5*

a Research career opportunities for employment in law, public safety, corrections, and security by exploring the law, public safety, corrections, and security career cluster. Link computer science and knowledge of ethics with employment opportunities in the law, public safety, corrections, and security career cluster. *1.5a*

b Examine the requirements, skills, wages, education, and employment opportunities in at least one career pathway from the law, public safety, corrections, and security career cluster. *1.5b*

c Link computer science and knowledge of ethics with employment opportunities in the law, public safety, corrections, and security career cluster. *1.5c*

Unit 2 Student Organizations *2*

2.1 Recognize opportunities to participate in student organizations related to technology and business. *2.1*

a Identify student organizations available at the school for technology and business students.List student competitions available through each organization *2.1a*

b List student competitions available through each organization *2.1b*

2.2 Recognize how a business meeting is conducted. *2.2*

a Illustrate the opening of a business meeting. *2.2a*

b Illustrate the closing of a business meeting. *2.2b*

2.3 Identify leadership and personal development styles. *2.3*

a List the characteristics of an effective leader. *2.3a*

b Explore the characteristics of personal development *2.3b*

Unit 3 21st Century Toolbox *3*

3.1 Differentiate between various learning styles and personality traits found within the classroom and workplace *3.1*

- **a** Complete the learning styles inventory. *3.1a*
- **b** Identify personality traits and complete a personality self-test. *3.1b*
- **c** Discuss strategies people can use to work effectively with one another regardless of their differences. *3.1c*

3.2 Demonstrate effective time management skills, study skills and note-taking strategies *3.2*

- **a** Develop short-term and long-term personal goals.Demonstrate use of technology to master study skills and time management skills. *3.2a*
- **b** Demonstrate use of technology to master note-taking. *3.2b*
- **c** Demonstrate use of technology to master study skills and time management skills. *3.2c*

3.3 Compare careers in each of the 16 national career clusters. *3.3*

- **a** Use career-planning software to become familiar with the 16 national career clusters and the opportunities for employment with each. *3.3a*

3.4 Perform interest-profiling and career-exploration exercises. *3.4*

- **a** Complete a career-interest survey and log results. *3.4a*
- **b** Explore career options in career cluster(s) of your choice. *3.4b*

3.5 Complete a career-plan builder. *3.5*

- **a** Explore careers identified in the interest profiler.Complete an eighth-grade course-builder plan. *3.5a*
- **b** Explore future education plans and lifestyle choices. *3.5b*
- **c** Complete an eighth-grade course-builder plan. *3.5c*

3.6 Review each student's Individual Success Plan (ISP) *3.6*

- **a** Link the ISP to the 16 national career clusters and to secondary and postsecondary education. *3.6a*
- **b** Apply the basic components of the ISP to build a plan of study. *3.6b*
- **c** Identify, select, and print courses that meet graduation requirements and reflect the ISP. *3.6c*

3.7 Demonstrate effective public speaking skills. Demonstrate presentation skills. *3.7*

- **a** Demonstrate effective communication in groups. *3.7a*
- **b** Demonstrate presentation skills. *3.7b*

3.8 Demonstrate knowledge of 21st Century skills. *3.8*

- **a** Collaboration and teamwork *3.8a*
- **b** Creativity and imagination *3.8b*
- **c** Critical thinking *3.8c*
- **d** Problem-solving *3.8d*

Unit 4 Personal Finance 4

4.1 Organize and use a budget to manage cash flow, plan for spending. *4.1*

- **a** Recognize the responsibilities associated with financial decisions. *4.1a*
- **b** Use reliable resources when making financial decisions. *4.1b*
- **c** Make criterion-based financial decisions by systematically considering alternatives and consequences *4.1c*
- **d** Create and calculate a sample project budget. *4.1d*
- **e** Apply consumer skills to spending and saving decisions. *4.1e*

4.2 Perform spreadsheet applications *4.2*

- **a** Explore spreadsheet software purpose and functions. *4.2a*
- **b** Identify terminology and key features including navigation related to spreadsheets. *4.2b*
- **c** Use basic spreadsheet formulas, functions, format and edit commands (sort, filter, edit, format, insert, delete, etc.). *4.2c*
- **d** Create and manipulate a spreadsheet in meaningful situations. *4.2d*

4.3 Develop and interpret spreadsheet tables, charts, and figures to support written and oral communication. *4.3*

- **a** Create spreadsheet tables, charts, and figures to support (data) written and oral communication. *4.3a*
- **b** Interpret spreadsheet tables, charts, and figures used to support (data) written and oral communication. *4.3b*

Unit 5 Interactive Games and Animations 5

5.1 Investigate programming for entertainment. *5.1*

- **a** Identify how Computer Science is used in a field of entertainment. *5.1a*

5.2 Investigate the use of shapes in gaming and animation. *5.2*

- **a** Reason about locations on a coordinate grid. *5.2a*
- **b** Communicate how to draw an image, accounting for shape position, color, and order. *5.2b*
- **c** Plot different colored shapes and be able to sequence code to correctly overlay shapes *5.2c*
- **d** Debug code written by others *5.2d*
- **e** Use and reason about drawing commands with multiple parameters. *5.2e*

5.3 Recall and use the problem-solving process. *5.3*

- **a** Communicate and collaborate with classmates in order to solve a problem. *5.3a*
- **b** Iteratively improve a solution to a problem. *5.3b*
- **c** Identify different strategies used to solve a problem, *5.3c*
- **d** Identify the four steps of the problem-solving process. *5.3d*

5.4 Investigate the use of variables in gaming and animation. *5.4*

- **a** Identify a variable as a way to label and reference a value in a program. *5.4a*
- **b** Use variables in a program to store a piece of information that is used multiple times. *5.4b*
- **c** Reason about and fix common errors encountered when programming with variables. *5.4c*
- **d** Read and follow the steps of a short program written in pseudocode that manipulates. variable values. *5.4d*

5.5 Demonstrate the use of sprites in gaming and animation. *5.5*

- **a** Assign a sprite to a variable. *5.5a*
- **b** Use dot notation to update a sprite's properties. *5.5b*
- **c** Create a static scene combining sprites, shapes, and text. *5.5c*
- **d** Describe the connection between updating a sprite's location properties and sprite movement on the screen. *5.5d*

5.6 Apply the use of draw loop in gaming and animation. *5.6*

- **a** Explain what an animation is and how it creates the illusion of smooth motion. *5.6a*
- **b** Explain how the draw loop allows for the creation of animations. *5.6b*
- **c** Use the draw loop in combination with the random Number () command, shapes, and sprites to make simple animations. *5.6c*

5.7 Demonstrate the use of movement in gaming and animation. *5.7*

- **a** Use the counter pattern to increment or decrement sprite properties. *5.7a*
- **b** Identify which sprite properties need to be changed, and in what way, to achieve a s specific movement. *5.7b*
- **c** Use the velocity and rotation Speed blocks to create and change sprite movements. *5.7c*
- **d** Describe the advantages of simplifying code by using higher level blocks. *5.7d*
- **e** Use sprite velocity with the counter pattern to create different types of sprite movement. *5.7e*

5.8 Examine the use of Booleans and conditionals in gaming and animation. *5.8*

- **a** Organize objects based on simple and compound Boolean statements. *5.8a*
- **b** Predict the output of simple Boolean statements. *5.8b*
- **c** Use conditionals to react to changes in variables and sprite properties. *5.8c*
- **d** Use conditionals to react to keyboard input. *5.8d*
- **e** Move sprites in response to keyboard input. *5.8e*
- **f** Use an else-statement as the fallback case to an if-statement. *5.8f*

5.9 Create games and animations using the game design process. *5.9*

- **a** Identify core programming constructs necessary to build different components of a game. *5.9a*
- **b** Create and use multi-frame animations in a program. *5.9b*
- **c** Create a plan for building a piece of software by describing its major components. *5.8c*
- **d** Implement a plan for creating a piece of software. *5.9d*

5.10 Investigate career opportunities in the STEM (game designer, mathematics, or entrepreneur) career cluster. *5.10*

- **a** Research career opportunities for employment in STEM (game designer, mathematics, or entrepreneur) career cluster by exploring the STEM (game designer, mathematics, or entrepreneur) career cluster. *5.10a*
- **b** Examine the requirements, skills, wages, education, and employment opportunities in at least one career pathway from the STEM (game designer, mathematics, or entrepreneur) career cluster. *5.10b*
- **c** Discuss how computer science impacts the STEM (game designer, mathematics, or entrepreneur) career cluster. *5.10c*

Unit 6 The Design Process 6

6.1 Identify and examine user needs to understand the purposes of design. 6.1

- **a** Express opinions respectfully and effectively. 6.1a
- **b** Critically evaluate an object for how well its design meets a given set of needs. 6.1b
- **c** Identify empathy for the user as an important component of the design process. 6.1c
- **d** Distinguish between creator needs and user needs. 6.1d

6.2 Develop paper prototypes to test ideas and assumptions. 6.2

- **a** Use a paper prototype to test out an app before programming it. 6.2a
- **b** Identify the user needs a prototype was designed to address. 6.2b
- **c** Categorize and prioritize user feedback for an app. 6.2c
- **d** Create a paper prototype for the screens of an app. 6.2d
- **e** Design the functionality of an app to address the specific needs of a user. 6.2e
- **f** Identify improvements to an app based on user testing. 6.2f
- **g** Design the user interface of an app 6.2g

6.3 Compare and contrast different types of apps. 6.3

- **a** Identify ways in which apps can affect social change. 6.3a
- **b** Identify the user needs addressed by an app. 6.3b

6.4 Develop digital prototype of an app. *6.4*

- **a** Construct transformations of graphic designs. *6.4a*
- **b** Construct graphic animations. *6.4b*
- **c** Generate the graphics and animations. *6.4c*

6.5 Revise and formulate improvements. *6.5*

- **a** Develop a detailed plan for testing prototype. *6.5a*
- **b** Collect and analyze test data. *6.5b*
- **c** Revise and formulate improvements based on testing. *6.5c*

6.6 Investigate career opportunities in the STEM (software development or engineering) career cluster. *6.6*

- **a** Research career opportunities for employment in the STEM (software development or engineering) career cluster. *6.6a*
- **b** Examine the requirements, skills, wages, education, and employment opportunities in at least one career pathway from the STEM (software development or engineering) career cluster. *6.6b*
- **c** Discuss how computer science impacts the STEM (software development or engineering) career cluster *6.6c*

Unit 7 Data, Computers, and Society 7

7.1 Examine data collection and representation using the problem-solving process. 7.1

- **a** Recognize data as information collected from the world to help make a recommendation or solve a problem. 7.1a
- **b** Provide examples of how representing data in different ways can affect its ability to solve different problems. 7.1b
- **c** Choose the best way to represent some information based on how it will be used. 7.1c
- **d** Describe the necessary features of a system for representing information. 7.1d
- **e** Create, use, and provide feedback on a system for representing information 7.1e
- **f** Iteratively improve upon a system for representing information by testing and responding to feedback. 7.1f

7.2 Identify and design ASCII and binary systems. 7.2

- **a** Define terms associated with ASCII and binary systems. 7.2a
- **b** Use the ASCII system to encode and decode text information in binary. 7.2b
- **c** Create and manipulate binary patterns to represent black-and-white images 7.2c
- **d** Describe common features of systems used to represent information in binary. 7.2d
- **e** Use a binary system to represent numbers. Extend a representation system based on patterns. 7.2e

7.3 Design and analyze digital security systems using encoding. 7.3

- **a** Apply a method of encryption to ensure the secure transmission of data. 7.3a
- **b** Use both physical and digital security measures to secure data 7.3b
- **c** Use multiple binary systems to decode information. 7.3c
- **d** Determine the most appropriate encoding system for a given piece of information 7.3d

7.4 Analyze and apply appropriate encoding systems. *7.4*

- **a** Choose and justify the use of different binary representation systems depending on the information being represented. *7.4a*
- **b** Encode and decode information represented in binary numbers and ASCII text. *7.4b*
- **c** Create a generalized representation system for many instances of a complex type of information. *7.4c*

7.5 Apply concepts to solve problems using data. *7.5*

- **a** Use the problem-solving process to answer questions using data. *7.5a*
- **b** Identify and collect relevant data to help solve a problem. *7.5b*
- **c** Use data to draw conclusions. *7.5c*

7.6 Investigate how data is collected. *7.6*

- **a** Give examples of how data is collected from sensors and by tracking user behavior. *7.6a*
- **b** Determine data that would be helpful in solving a problem, and how that data could be collected. *7.6b*
- **c** Distinguish between data that users intentionally and unintentionally produce. *7.6c*

7.7 Analyze and revise data to make it useful. *7.7*

- **a** Identify and remove irrelevant data from a data sheet. *7.7a*
- **b** Create a bar chart based on a set of data. *7.7b*
- **c** Explain why a set of data must be cleaned before a computer can use it. *7.7c*

7.8 Critique data to make and support decisions using that data. *7.8*

- **a** Use tables and visualizations summarizing data to support a decision. *7.8a*
- **b** Present and critique interpretations of tables and visualizations. *7.8b*
- **c** Identify additional data that could be collected to improve a decision. *7.8c*
- **d** Organize data to support a claim. *7.8d*
- **e** Find patterns and relationships in data. *7.8e*

7.9 Construct a plan to automate data decisions. *7.9*

- **a** Design an algorithm for making decisions using data as inputs. *7.9a*
- **b** Explain the benefits and drawbacks of using computers for automated decision-making. *7.9b*
- **c** Interpret collected data to identify patterns. *7.9c*

7.10 Apply concepts of data collection and interpretation of data to make a recommendation. *7.10*

- **a** Apply the data problem-solving process to a personally relevant topic. *7.10a*
- **b** Determine appropriate sources of data needed to solve a problem. *7.10b*

7.11 Investigate career opportunities in the STEM (cyber security or genetics) career cluster. *7.11*

- **a** Research career opportunities for employment in the STEM (cyber security or genetics) career cluster. *7.11a*
- **b** Examine the requirements, skills, wages, education, and employment opportunities in at least one career pathway from the STEM (cyber security or genetics) career cluster *7.11b*
- **c** Discuss how computer science impacts the STEM (cyber security or genetics) career cluster. *7.11c*

Unit 8 Physical Computing 8

8.1 Investigate innovations in computing and computing devices. 8.1

- **a** Identify computing innovations within a given field. 8.1a
- **b** For a given device, articulate the likely inputs and outputs. 8.1b
- **c** Suggest improvements to help a device better solve a specific problem. 8.1c

8.2 Investigate user interface properties. 8.2

- **a** Set the properties of user interface elements using code. 8.2a
- **b** Respond to user input using an event handler. 8.2b
- **c** Write programs that change multiple elements on a single screen instead of changing screens. 8.2c