

Texas Essential Knowledge and Skills for Technology Applications - Computer Science II

Foundations		Information Acquisition	
<p>Demonstrates knowledge and appropriate use of hardware components, software programs, and their connections.</p> <p>1A Identify object-oriented data types and delineate the advantages/disadvantages of object data</p> <p>1B Demonstrate coding proficiency in contemporary programming languages including an object-oriented language</p> <p>1C Survey the issues accompanying the development of large software systems such as design/implementation teams, software validation/testing, and risk assessment</p> <p>Uses data input skills appropriate to the task.</p> <p>2A Demonstrate proficiency in the use of a variety of input devices such as keyboard, scanner, voice/soundrecorder, mouse, touch screen, or digital video by appropriately incorporating such components into the product</p> <p>2B Use digital keyboarding standards for the input of data</p>	<p>Complies with laws and examines issues regarding use of technology in society.</p> <p>3A Discuss copyright laws/issues and model ethical acquisition and use of digital information, citing sources using established methods</p> <p>3B Demonstrate proper etiquette and knowledge of acceptable use policies when using networks, especially resources on the Internet and intranet</p> <p>3C Investigate measures, such as passwords or virus detection/prevention, to protect computer systems and databases from unauthorized use and tampering</p> <p>3D Code modules for the World Wide Web (WWW) community</p>	<p>Uses a variety of strategies to acquire information from electronic resources, with appropriate supervision.</p> <p>4A Construct search algorithms including linear and binary searches</p> <p>4B Compare and contrast search and sort algorithms including linear and binary searches for different purposes and search time</p> <p>Acquires electronic information in variety of formats, with appropriate supervision.</p> <p>5A Acquire information in and knowledge about electronic formats including text, audio, video, and graphics</p> <p>5B Use a variety of resources, including foundation and enrichment curricula, together with various productivity tools to gather authentic data as a basis for individual and group programming projects</p>	<p>Evaluates acquired electronic information.</p> <p>6A Determine and employ methods to evaluate the design and functionality of the process using effective coding, design, and test data</p> <p>6B Implement methods for the evaluation of the information using defined rubrics</p>



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Solving Problems		Communication	
<p>Uses appropriate computer-based productivity tools to create and modify solutions to problems.</p> <p>7A Use appropriately and trace recursion in program design comparing invariant, iterative, and recursive algorithms</p> <p>7B Manipulate data structures using string processing</p> <p>7C Use notation for language definition such as syntax diagrams or Backus-Naur forms</p> <p>7D Identify, describe, and use sequential/non-sequential files; multidimensional arrays and arrays of records; and quadratic sort algorithms such as selection, bubble, or insertion, and more efficient algorithms including merge, shell, and quick sorts</p> <p>7E Create robust programs with increased emphasis on design, style, clarity of expression and documentation for ease of maintenance, program expansion, reliability, and validity</p> <p>7F Apply methods for computing iterative approximations and statistical algorithms</p> <p>7G Define and develop code using the concepts of abstract data types including stacks, queues, linked lists, trees, graphs, and information hiding</p> <p>7H Identify and describe the correctness and complexity of algorithms such as divide and conquer, backtracking, or greedy algorithms</p> <p>7I Develop software to solve a school or community problem such as customer relations, design, modular programming, documentation, validation, marketing, or support</p> <p>7J Research advanced computer science concepts such as applied artificial intelligence, expert systems, robotics, depth-first/breadth-first and heuristic search strategies, multitasking operating systems, or computer architecture, such as reduced instruction set computer (RISC) and complex instruction set computer (CISC)</p>	<p>Uses research skills and electronic communication, with appropriate supervision, to create new knowledge.</p> <p>8A Participate with electronic communities as a learner, initiator, contributor, and teacher/mentor</p> <p>8B Demonstrate proficiency in, appropriate use of, and navigation of local area networks (LANs) and wide area networks (WANs) for research and for sharing of resources</p> <p>8C Extend the learning environment beyond the school walls with digital products created to increase teaching and learning in the foundation and enrichment curricula</p> <p>8D Participate in relevant, meaningful activities in the larger community and society to create electronic projects</p> <p>Uses technology applications to facilitate evaluation of work, both process and product.</p> <p>9A Demonstrate the ability to read and modify large programs including the design description and process development</p> <p>9B Analyze algorithms using "big-O" notation, best, average, and worst case space techniques</p> <p>9C Compare and contrast design methodologies including top-down and bottom-up</p> <p>9D Analyze models used in development of software including software life cycle models, design objectives, documentation, and support</p> <p>9E Seek and respond to advice from peers and professionals in delineating technological tasks</p>	<p>Formats digital information for appropriate and effective communication.</p> <p>10A Annotate coding properly with comments, indentation, and formatting</p> <p>10B Create interactive documents using modeling, simulation, and hypertext</p> <p>Delivers the product electronically in a variety of media, with appropriate supervision.</p> <p>11A Publish information in a variety of ways including, but not limited to, printed copy and monitor displays</p> <p>11B Publish information in a variety of ways including, but not limited to, software, Internet documents, and video</p>	<p>Uses technology applications to facilitate evaluation of communication, both process and product.</p> <p>12A Write technology specifications for planning and evaluation rubrics documenting variables, prompts, and program internally and externally</p> <p>12B Seek and respond to advice from peers and professionals in evaluating the product</p> <p>12C Debug and solve problems using reference materials and effective strategies</p>

