Subject	§126.Technology Applications			
Course Title	§126.34. Computer Science II (One Credit), Beginning with School Year 2012-2013			
TEKS (Knowledge and	Student Expectation	Breakout	Element	Subelement
(a) General Requirements. General requirements. Students shall be awarded one credit for successful completion of this course. The required prerequisites for this course are Algebra I and either Computer Science I or Fundamentals of Computer Science. This course is recommended for students in Grades 11 and 12.				
(b) Introduction.				
(1) The technology applications curriculum has six strands based on the National Educational Technology Standards for Students (NETS•S) and performance indicators developed by the International Society for Technology in Education (ISTE): creativity and innovation; communication and collaboration; research and information fluency; critical thinking, problem solving, and decision making; digital citizenship; and Technology operations and concepts. (2) Computer Science II will foster students' creativity and innovation by presenting opportunities to design, implement, and present meaningful programs through a variety of media. Students will collaborate with one another, their instructor, and various electronic communities to solve the problems presented throughout the course. Through data analysis, students will identify task requirements, plan search strategies, and use computer science concepts to access, analyze, and evaluate information needed to solve problems. By using computer science knowledge and skills that support the work of individuals and groups in solving problems, students will select the technology appropriate for the task, synthesize knowledge, create solutions, and evaluate the results. Students will learn digital citizenship by researching current laws and regulations and by practicing integrity and respect. Students will gain an understanding of computer science through the study of technology operations, systems, and concepts. (3) Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples.				
(c) Knowledge and Skills.				
(1) Creativity and innovation. The student develops products and generates new understanding by extending existing knowledge. The student is expected to:	(A) use program design problem-solving strategies to create program solutions			
(1) Creativity and innovation. The student develops products and generates new understanding by extending existing knowledge. The student is expected to:	(B) demonstrate the ability to read and modify large programs, including design description and process development	(i) demonstrate the ability to read large programs, including design description		

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(1) Creativity and innovation. The student develops products and generates new understanding by extending existing knowledge. The student is expected to:	(B) demonstrate the ability to read and modify large programs, including design description and process development	(ii) demonstrate the ability to read large programs, including process development		
(1) Creativity and innovation. The student develops products and generates new understanding by extending existing knowledge. The student is expected to:	(B) demonstrate the ability to read and modify large programs, including design description and process development	(iii) demonstrate the ability to modify large programs, including design description		
(1) Creativity and innovation. The student develops products and generates new understanding by extending existing knowledge. The student is expected to:	(B) demonstrate the ability to read and modify large programs, including design description and process development	(iv) demonstrate the ability to modify large programs, including process development		
(1) Creativity and innovation. The student develops products and generates new understanding by extending existing knowledge. The student is expected to:	(C) follow the systematic problem-solving process of identifying the specifications of purpose and goals, the data types and objects needed, and the subtasks to be performed	(i) follow the systematic problem-solving process or identifying the specifications of purpose		
(1) Creativity and innovation. The student develops products and generates new understanding by extending existing knowledge. The student is expected to:	(C) follow the systematic problem-solving process of identifying the specifications of purpose and goals, the data types and objects needed, and the subtasks to be performed	(ii) follow the systematic problem-solving process or identifying the specifications of goals		

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TEKS (Knowledge and	Student Expectation	Breakout	Element	Subelement
(1) Creativity and innovation. The student develops products and generates new understanding by extending existing knowledge. The student is expected to:	(C) follow the systematic problem-solving process of identifying the specifications of purpose and goals, the data types and objects needed, and the subtasks to be performed	(iii) follow the systematic problem-solving process of identifying the data types		
(1) Creativity and innovation. The student develops products and generates new understanding by extending existing knowledge. The student is expected to:	(C) follow the systematic problem-solving process of identifying the specifications of purpose and goals, the data types and objects needed, and the subtasks to be performed	(iv) follow the systematic problem-solving process of identifying the objects needed		
(1) Creativity and innovation. The student develops products and generates new understanding by extending existing knowledge. The student is expected to:	(C) follow the systematic problem-solving process of identifying the specifications of purpose and goals, the data types and objects needed, and the subtasks to be performed	(v) follow the systematic problem-solving process of identifying the subtasks to be performed		
(1) Creativity and innovation. The student develops products and generates new understanding by extending existing knowledge. The student is expected to:	(D) compare and contrast design methodologies and implementation techniques such as top-down, bottom-up, and black box	(i) compare design methodologies and implementation techniques		
(1) Creativity and innovation. The student develops products and generates new understanding by extending existing knowledge. The student is expected to:	(D) compare and contrast design methodologies and implementation techniques such as top-down, bottom-up, and black box	(ii) contrast design methodologies and implementation techniques		

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TEKS (Knowledge and	Student Expectation	Breakout	Element	Subelement
(1) Creativity and innovation. The student develops products and generates new understanding by extending existing knowledge. The student is expected to:	(E) analyze, modify, and evaluate existing code by performing a case study on a large program, including inheritance and black box programming	(i) analyze existing code by performing a case study on a large program, including inheritance programming		
(1) Creativity and innovation. The student develops products and generates new understanding by extending existing knowledge. The student is expected to:	(E) analyze, modify, and evaluate existing code by performing a case study on a large program, including inheritance and black box programming	(ii) analyze existing code by performing a case study on a large program, including black box programming		
(1) Creativity and innovation. The student develops products and generates new understanding by extending existing knowledge. The student is expected to:	(E) analyze, modify, and evaluate existing code by performing a case study on a large program, including inheritance and black box programming	(iii) modify existing code by performing a case study on a large program, including inheritance programming		
(1) Creativity and innovation. The student develops products and generates new understanding by extending existing knowledge. The student is expected to:	(E) analyze, modify, and evaluate existing code by performing a case study on a large program, including inheritance and black box programming	(iv) modify existing code by performing a case study on a large program, including black box programming		
(1) Creativity and innovation. The student develops products and generates new understanding by extending existing knowledge. The student is expected to:	(E) analyze, modify, and evaluate existing code by performing a case study on a large program, including inheritance and black box programming	(v) evaluate existing code by performing a case study on a large program, including inheritance programming		

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TEKS (Knowledge and	Student Expectation	Breakout	Element	Subelement
(1) Creativity and innovation. The student develops products and generates new understanding by extending existing knowledge. The student is expected to:	(E) analyze, modify, and evaluate existing code by performing a case study on a large program, including inheritance and black box programming	(vi) evaluate existing code by performing a case study on a large program, including black box programming		
(1) Creativity and innovation. The student develops products and generates new understanding by extending existing knowledge. The student is expected to:	(F) identify the data types and objects needed to solve a problem	(i) identify the data types needed to solve a problem		
(1) Creativity and innovation. The student develops products and generates new understanding by extending existing knowledge. The student is expected to:	(F) identify the data types and objects needed to solve a problem	(ii) identify the objects needed to solve a problem		
(1) Creativity and innovation. The student develops products and generates new understanding by extending existing knowledge. The student is expected to:	(G) choose, identify, and use the appropriate abstract data type, advanced data structure, and supporting algorithms to properly represent the data in a program problem solution	(i) choose the appropriate abstract data type to properly represent the data in a program problem solution		
(1) Creativity and innovation. The student develops products and generates new understanding by extending existing knowledge. The student is expected to:	(G) choose, identify, and use the appropriate abstract data type, advanced data structure, and supporting algorithms to properly represent the data in a program problem solution	(ii) choose the appropriate advanced data structure to properly represent the data in a program problem solution		

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TEKS (Knowledge and	**Student Expectation**	**Breakout**	**Element**	**Subelement**
(1) Creativity and innovation. The student develops products and generates new understanding by extending existing knowledge. The student is expected to:	(G) choose, identify, and use the appropriate abstract data type, advanced data structure, and supporting algorithms to properly represent the data in a program problem solution	(iii) choose the appropriate supporting algorithms to properly represent the data in a program problem solution		
(1) Creativity and innovation. The student develops products and generates new understanding by extending existing knowledge. The student is expected to:	(G) choose, identify, and use the appropriate abstract data type, advanced data structure, and supporting algorithms to properly represent the data in a program problem solution	(iv) identify the appropriate abstract data type to properly represent the data in a program problem solution		
(1) Creativity and innovation. The student develops products and generates new understanding by extending existing knowledge. The student is expected to:	(G) choose, identify, and use the appropriate abstract data type, advanced data structure, and supporting algorithms to properly represent the data in a program problem solution	(v) identify the appropriate advanced data structure to properly represent the data in a program problem solution		
(1) Creativity and innovation. The student develops products and generates new understanding by extending existing knowledge. The student is expected to:	(G) choose, identify, and use the appropriate abstract data type, advanced data structure, and supporting algorithms to properly represent the data in a program problem solution	(vi) identify the appropriate supporting algorithms to properly represent the data in a program problem solution		

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TEKS (Knowledge and	**Student Expectation**	**Breakout**	**Element**	**Subelement**
(1) Creativity and innovation. The student develops products and generates new understanding by extending existing knowledge. The student is expected to:	(G) choose, identify, and use the appropriate abstract data type, advanced data structure, and supporting algorithms to properly represent the data in a program problem solution	(vii) use the appropriate abstract data type to properly represent the data in a program problem solution		
(1) Creativity and innovation. The student develops products and generates new understanding by extending existing knowledge. The student is expected to:	(G) choose, identify, and use the appropriate abstract data type, advanced data structure, and supporting algorithms to properly represent the data in a program problem solution	(viii) use the appropriate advanced data structure to properly represent the data in a program problem solution		
(1) Creativity and innovation. The student develops products and generates new understanding by extending existing knowledge. The student is expected to:	(G) choose, identify, and use the appropriate abstract data type, advanced data structure, and supporting algorithms to properly represent the data in a program problem solution	(ix) use the appropriate supporting algorithms to properly represent the data in a program problem solution		
(1) Creativity and innovation. The student develops products and generates new understanding by extending existing knowledge. The student is expected to:	(H) use object-oriented programming development methodology, data abstraction, encapsulation with information hiding, and procedural abstraction in program development and testing	(i) use object-oriented programming development methodology in program development		

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TEKS (Knowledge and	Student Expectation	Breakout	Element	Subelement
(1) Creativity and innovation. The student develops products and generates new understanding by extending existing knowledge. The student is expected to:	(H) use object-oriented programming development methodology, data abstraction, encapsulation with information hiding, and procedural abstraction in program development and testing	(ii) use object-oriented programming development methodology in testing		
(1) Creativity and innovation. The student develops products and generates new understanding by extending existing knowledge. The student is expected to:	(H) use object-oriented programming development methodology, data abstraction, encapsulation with information hiding, and procedural abstraction in program development and testing	(iii) use data abstraction in program development		
(1) Creativity and innovation. The student develops products and generates new understanding by extending existing knowledge. The student is expected to:	(H) use object-oriented programming development methodology, data abstraction, encapsulation with information hiding, and procedural abstraction in program development and testing	(iv) use data abstraction in testing		
(1) Creativity and innovation. The student develops products and generates new understanding by extending existing knowledge. The student is expected to:	(H) use object-oriented programming development methodology, data abstraction, encapsulation with information hiding, and procedural abstraction in program development and testing	(v) use encapsulation with information hiding in program development		

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TEKS (Knowledge and	Student Expectation	Breakout	Element	Subelement
(1) Creativity and innovation. The student develops products and generates new understanding by extending existing knowledge. The student is expected to:	(H) use object-oriented programming development methodology, data abstraction, encapsulation with information hiding, and procedural abstraction in program development and testing	(vi) use encapsulation with information hiding in testing		
(1) Creativity and innovation. The student develops products and generates new understanding by extending existing knowledge. The student is expected to:	(H) use object-oriented programming development methodology, data abstraction, encapsulation with information hiding, and procedural abstraction in program development and testing	(vii) use procedural abstraction in program development		
(1) Creativity and innovation. The student develops products and generates new understanding by extending existing knowledge. The student is expected to:	(H) use object-oriented programming development methodology, data abstraction, encapsulation with information hiding, and procedural abstraction in program development and testing	(viii) use procedural abstraction in testing		
(1) Creativity and innovation. The student develops products and generates new understanding by extending existing knowledge. The student is expected to:	(I) create, edit, and manipulate bitmap images that are used to enhance user interfaces and program functionality	(i) create bitmap images that are used to enhance user interfaces		

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TEKS (Knowledge and	Student Expectation	Breakout	Element	Subelement
(1) Creativity and innovation. The student develops products and generates new understanding by extending existing knowledge. The student is expected to:	(I) create, edit, and manipulate bitmap images that are used to enhance user interfaces and program functionality	(ii) create bitmap images that are used to enhance program functionality		
(1) Creativity and innovation. The student develops products and generates new understanding by extending existing knowledge. The student is expected to:	(I) create, edit, and manipulate bitmap images that are used to enhance user interfaces and program functionality	(iii) edit bitmap images that are used to enhance user interfaces		
(1) Creativity and innovation. The student develops products and generates new understanding by extending existing knowledge. The student is expected to:	(I) create, edit, and manipulate bitmap images that are used to enhance user interfaces and program functionality	(iv) edit bitmap images that are used to enhance program functionality		
(1) Creativity and innovation. The student develops products and generates new understanding by extending existing knowledge. The student is expected to:	(I) create, edit, and manipulate bitmap images that are used to enhance user interfaces and program functionality	(v) manipulate bitmap images that are used to enhance user interfaces		
(1) Creativity and innovation. The student develops products and generates new understanding by extending existing knowledge. The student is expected to:	(I) create, edit, and manipulate bitmap images that are used to enhance user interfaces and program functionality	(vi) manipulate bitmap images that are used to enhance program functionality		

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TEKS (Knowledge and	Student Expectation	Breakout	Element	Subelement
(2) Communication and collaboration. The student communicates and collaborates with peers to contribute to his or her own learning and the learning of others. The student is expected to:	(A) use the principles of software engineering to work in software design teams, break a problem statement into specific solution requirements, create a program development plan, code part of a solution from a program development plan while a partner codes the remaining part, team test the solution for correctness, and develop presentations to report the solution findings	(i) use the principles of software engineering to work in software design teams		
(2) Communication and collaboration. The student communicates and collaborates with peers to contribute to his or her own learning and the learning of others. The student is expected to:	(A) use the principles of software engineering to work in software design teams, break a problem statement into specific solution requirements, create a program development plan, code part of a solution from a program development plan while a partner codes the remaining part, team test the solution for correctness, and develop presentations to report the solution findings	(ii) use the principles of software engineering to break a problem statement into specific solution requirements		

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TEKS (Knowledge and	**Student Expectation**	**Breakout**	**Element**	**Subelement**
(2) Communication and collaboration. The student communicates and collaborates with peers to contribute to his or her own learning and the learning of others. The student is expected to:	(A) use the principles of software engineering to work in software design teams, break a problem statement into specific solution requirements, create a program development plan, code part of a solution from a program development plan while a partner codes the remaining part, team test the solution for correctness, and develop presentations to report the solution findings	(iii) use the principles of software engineering to create a program development plan		
(2) Communication and collaboration. The student communicates and collaborates with peers to contribute to his or her own learning and the learning of others. The student is expected to:	(A) use the principles of software engineering to work in software design teams, break a problem statement into specific solution requirements, create a program development plan, code part of a solution from a program development plan while a partner codes the remaining part, team test the solution for correctness, and develop presentations to report the solution findings	(iv) use the principles of software engineering to code part of a solution from a program development plan while a partner codes the remaining part		

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TEKS (Knowledge and	**Student Expectation**	**Breakout**	**Element**	**Subelement**
(2) Communication and collaboration. The student communicates and collaborates with peers to contribute to his or her own learning and the learning of others. The student is expected to:	(A) use the principles of software engineering to work in software design teams, break a problem statement into specific solution requirements, create a program development plan, code part of a solution from a program development plan while a partner codes the remaining part, team test the solution for correctness, and develop presentations to report the solution findings	(v) use the principles of software engineering to team test the solution for correctness		
(2) Communication and collaboration. The student communicates and collaborates with peers to contribute to his or her own learning and the learning of others. The student is expected to:	(A) use the principles of software engineering to work in software design teams, break a problem statement into specific solution requirements, create a program development plan, code part of a solution from a program development plan while a partner codes the remaining part, team test the solution for correctness, and develop presentations to report the solution findings	(vi) use the principles of software engineering to develop presentations to report the solution findings		

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(2) Communication and collaboration. The student communicates and collaborates with peers to contribute to his or her own learning and the learning of others. The student is expected to:	(B) create interactive console display interfaces with appropriate user prompts			
(2) Communication and collaboration. The student communicates and collaborates with peers to contribute to his or her own learning and the learning of others. The student is expected to:	(C) create interactive human interfaces to acquire data from a user and display program results using an advanced Graphical User Interface (GUI)	(i) create interactive human interfaces to acquire data from a user		
(2) Communication and collaboration. The student communicates and collaborates with peers to contribute to his or her own learning and the learning of others. The student is expected to:	(C) create interactive human interfaces to acquire data from a user and display program results using an advanced Graphical User Interface (GUI)	(ii) create interactive human interfaces to display program results using an advanced Graphical User Interface (GUI)		
(2) Communication and collaboration. The student communicates and collaborates with peers to contribute to his or her own learning and the learning of others. The student is expected to:	(D) write programs and communicate with proper programming style to enhance the readability and functionality of the code by using meaningful descriptive identifiers, internal comments, white space, indentation, and a standardized program style	(i) write programs with proper programming style to enhance the readability of the code by using meaningful descriptive identifiers		

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(2) Communication and collaboration. The student communicates and collaborates with peers to contribute to his or her own learning and the learning of others. The student is expected to:	(D) write programs and communicate with proper programming style to enhance the readability and functionality of the code by using meaningful descriptive identifiers, internal comments, white space, indentation, and a standardized program style	(ii) write programs with proper programming style to enhance the readability of the code by using internal comments		
(2) Communication and collaboration. The student communicates and collaborates with peers to contribute to his or her own learning and the learning of others. The student is expected to:	(D) write programs and communicate with proper programming style to enhance the readability and functionality of the code by using meaningful descriptive identifiers, internal comments, white space, indentation, and a standardized program style	(iii) write programs with proper programming style to enhance the readability of the code by using white space		
(2) Communication and collaboration. The student communicates and collaborates with peers to contribute to his or her own learning and the learning of others. The student is expected to:	(D) write programs and communicate with proper programming style to enhance the readability and functionality of the code by using meaningful descriptive identifiers, internal comments, white space, indentation, and a standardized program style	(iv) write programs with proper programming style to enhance the readability of the code by using indentation		
(2) Communication and collaboration. The student communicates and collaborates with peers to contribute to his or her own learning and the learning of others. The student is expected to:	(D) write programs and communicate with proper programming style to enhance the readability and functionality of the code by using meaningful descriptive identifiers, internal comments, white space, indentation, and a standardized program style	(v) write programs with proper programming style to enhance the readability of the code by using a standardized program style		

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(2) Communication and collaboration. The student communicates and collaborates with peers to contribute to his or her own learning and the learning of others. The student is expected to:	(D) write programs and communicate with proper programming style to enhance the readability and functionality of the code by using meaningful descriptive identifiers, internal comments, white space, indentation, and a standardized program style	(vi) write programs with proper programming style to enhance the functionality of the code by using meaningful descriptive identifiers		
(2) Communication and collaboration. The student communicates and collaborates with peers to contribute to his or her own learning and the learning of others. The student is expected to:	(D) write programs and communicate with proper programming style to enhance the readability and functionality of the code by using meaningful descriptive identifiers, internal comments, white space, indentation, and a standardized program style	(vii) write programs with proper programming style to enhance the functionality of the code by using internal comments		
(2) Communication and collaboration. The student communicates and collaborates with peers to contribute to his or her own learning and the learning of others. The student is expected to:	(D) write programs and communicate with proper programming style to enhance the readability and functionality of the code by using meaningful descriptive identifiers, internal comments, white space, indentation, and a standardized program style	(viii) write programs with proper programming style to enhance the functionality of the code by using white space		
(2) Communication and collaboration. The student communicates and collaborates with peers to contribute to his or her own learning and the learning of others. The student is expected to:	(D) write programs and communicate with proper programming style to enhance the readability and functionality of the code by using meaningful descriptive identifiers, internal comments, white space, indentation, and a standardized program style	(ix) write programs with proper programming style to enhance the functionality of the code by using indentation		

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(2) Communication and collaboration. The student communicates and collaborates with peers to contribute to his or her own learning and the learning of others. The student is expected to:	(D) write programs and communicate with proper programming style to enhance the readability and functionality of the code by using meaningful descriptive identifiers, internal comments, white space, indentation, and a standardized program style	(x) write programs with proper programming style to enhance the functionality of the code by using a standardized program style		
(2) Communication and collaboration. The student communicates and collaborates with peers to contribute to his or her own learning and the learning of others. The student is expected to:	(D) write programs and communicate with proper programming style to enhance the readability and functionality of the code by using meaningful descriptive identifiers, internal comments, white space, indentation, and a standardized program style	(xi) communicate with proper programming style to enhance the readability of the code by using meaningful descriptive identifiers		
(2) Communication and collaboration. The student communicates and collaborates with peers to contribute to his or her own learning and the learning of others. The student is expected to:	(D) write programs and communicate with proper programming style to enhance the readability and functionality of the code by using meaningful descriptive identifiers, internal comments, white space, indentation, and a standardized program style	(xii) communicate with proper programming style to enhance the readability of the code by using internal comments		
(2) Communication and collaboration. The student communicates and collaborates with peers to contribute to his or her own learning and the learning of others. The student is expected to:	(D) write programs and communicate with proper programming style to enhance the readability and functionality of the code by using meaningful descriptive identifiers, internal comments, white space, indentation, and a standardized program style	(xiii) communicate with proper programming style to enhance the readability of the code by using white space		

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(2) Communication and collaboration. The student communicates and collaborates with peers to contribute to his or her own learning and the learning of others. The student is expected to:	(D) write programs and communicate with proper programming style to enhance the readability and functionality of the code by using meaningful descriptive identifiers, internal comments, white space, indentation, and a standardized program style	(xiv) communicate with proper programming style to enhance the readability of the code by using indentation		
(2) Communication and collaboration. The student communicates and collaborates with peers to contribute to his or her own learning and the learning of others. The student is expected to:	(D) write programs and communicate with proper programming style to enhance the readability and functionality of the code by using meaningful descriptive identifiers, internal comments, white space, indentation, and a standardized program style	(xv) communicate with proper programming style to enhance the readability of the code by using a standardized program style		
(2) Communication and collaboration. The student communicates and collaborates with peers to contribute to his or her own learning and the learning of others. The student is expected to:	(D) write programs and communicate with proper programming style to enhance the readability and functionality of the code by using meaningful descriptive identifiers, internal comments, white space, indentation, and a standardized program style	(xvi) communicate programs with proper programming style to enhance the functionality of the code by using meaningful descriptive identifiers		
(2) Communication and collaboration. The student communicates and collaborates with peers to contribute to his or her own learning and the learning of others. The student is expected to:	(D) write programs and communicate with proper programming style to enhance the readability and functionality of the code by using meaningful descriptive identifiers, internal comments, white space, indentation, and a standardized program style	(xvii) communicate programs with proper programming style to enhance the functionality of the code by using internal comments		

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(2) Communication and collaboration. The student communicates and collaborates with peers to contribute to his or her own learning and the learning of others. The student is expected to:	(D) write programs and communicate with proper programming style to enhance the readability and functionality of the code by using meaningful descriptive identifiers, internal comments, white space, indentation, and a standardized program style	(xviii) communicate with proper programming style to enhance the functionality of the code by using white space		
(2) Communication and collaboration. The student communicates and collaborates with peers to contribute to his or her own learning and the learning of others. The student is expected to:	(D) write programs and communicate with proper programming style to enhance the readability and functionality of the code by using meaningful descriptive identifiers, internal comments, white space, indentation, and a standardized program style	(xix) communicate with proper programming style to enhance the functionality of the code by using indentation		
(2) Communication and collaboration. The student communicates and collaborates with peers to contribute to his or her own learning and the learning of others. The student is expected to:	(D) write programs and communicate with proper programming style to enhance the readability and functionality of the code by using meaningful descriptive identifiers, internal comments, white space, indentation, and a standardized program style	(xx) communicate with proper programming style to enhance the functionality of the code by using a standardized program style		
(2) Communication and collaboration. The student communicates and collaborates with peers to contribute to his or her own learning and the learning of others. The student is expected to:	(E) improve data display by optimizing data visualization			

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(2) Communication and collaboration. The student communicates and collaborates with peers to contribute to his or her own learning and the learning of others. The student is expected to:	(F) display simple vector graphics to interpret and display program results	(i) display simple vector graphics to interpret program results		
(2) Communication and collaboration. The student communicates and collaborates with peers to contribute to his or her own learning and the learning of others. The student is expected to:	(F) display simple vector graphics to interpret and display program results	(ii) display simple vector graphics to display program results		
(2) Communication and collaboration. The student communicates and collaborates with peers to contribute to his or her own learning and the learning of others. The student is expected to:	(G) display simple bitmap images			
(3) Research and information fluency. The student locates, analyzes, processes, and organizes data. The student is expected to:	(A) use local area networks (LANs) and wide area networks (WANs), including the Internet and intranets, in research, file management, and collaboration	(i) use local area networks (LANs), including the Internet, in research		

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TEKS (Knowledge and	Student Expectation	Breakout	Element	Subelement
(3) Research and information fluency. The student locates, analyzes, processes, and organizes data. The student is expected to:	(A) use local area networks (LANs) and wide area networks (WANs), including the Internet and intranets, in research, file management, and collaboration	(ii) use local area networks (LANs), including the Internet, in file management		
(3) Research and information fluency. The student locates, analyzes, processes, and organizes data. The student is expected to:	(A) use local area networks (LANs) and wide area networks (WANs), including the Internet and intranets, in research, file management, and collaboration	(iii) use local area networks (LANs), including the Internet, in collaboration		
(3) Research and information fluency. The student locates, analyzes, processes, and organizes data. The student is expected to:	(A) use local area networks (LANs) and wide area networks (WANs), including the Internet and intranets, in research, file management, and collaboration	(iv) use local area networks (LANs), including intranets, in research		
(3) Research and information fluency. The student locates, analyzes, processes, and organizes data. The student is expected to:	(A) use local area networks (LANs) and wide area networks (WANs), including the Internet and intranets, in research, file management, and collaboration	(v) use local area networks (LANs), including intranets, in file management		
(3) Research and information fluency. The student locates, analyzes, processes, and organizes data. The student is expected to:	(A) use local area networks (LANs) and wide area networks (WANs), including the Internet and intranets, in research, file management, and collaboration	(vi) use local area networks (LANs), including intranets, in collaboration		
(3) Research and information fluency. The student locates, analyzes, processes, and organizes data. The student is expected to:	(A) use local area networks (LANs) and wide area networks (WANs), including the Internet and intranets, in research, file management, and collaboration	(vii) use wide area networks (WANs), including the Internet, in research		

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TEKS (Knowledge and	**Student Expectation**	**Breakout**	**Element**	**Subelement**
(3) Research and information fluency. The student locates, analyzes, processes, and organizes data. The student is expected to:	(A) use local area networks (LANs) and wide area networks (WANs), including the Internet and intranets, in research, file management, and collaboration	(viii) use wide area networks (WANs), including the Internet, in file management		
(3) Research and information fluency. The student locates, analyzes, processes, and organizes data. The student is expected to:	(A) use local area networks (LANs) and wide area networks (WANs), including the Internet and intranets, in research, file management, and collaboration	(ix) use wide area networks (WANs), including the Internet, in collaboration		
(3) Research and information fluency. The student locates, analyzes, processes, and organizes data. The student is expected to:	(A) use local area networks (LANs) and wide area networks (WANs), including the Internet and intranets, in research, file management, and collaboration	(x) use wide area networks (WANs), including intranets, in research		
(3) Research and information fluency. The student locates, analyzes, processes, and organizes data. The student is expected to:	(A) use local area networks (LANs) and wide area networks (WANs), including the Internet and intranets, in research, file management, and collaboration	(xi) use wide area networks (WANs), including intranets, in file management		
(3) Research and information fluency. The student locates, analyzes, processes, and organizes data. The student is expected to:	(A) use local area networks (LANs) and wide area networks (WANs), including the Internet and intranets, in research, file management, and collaboration	(xii) use wide area networks (WANs), including intranets, in collaboration		
(3) Research and information fluency. The student locates, analyzes, processes, and organizes data. The student is expected to:	(B) understand programming file structure and file access for required resources	(i) understand programming file structure for required resources		

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TEKS (Knowledge and	Student Expectation	Breakout	Element	Subelement
(3) Research and information fluency. The student locates, analyzes, processes, and organizes data. The student is expected to:	(B) understand programming file structure and file access for required resources	(ii) understand programming file access for required resources		
(3) Research and information fluency. The student locates, analyzes, processes, and organizes data. The student is expected to:	(C) acquire and process information from text files, including files of known and an unknown sizes	(i) acquire information from text files, including files of a known sizes		
(3) Research and information fluency. The student locates, analyzes, processes, and organizes data. The student is expected to:	(C) acquire and process information from text files, including files of known and an unknown sizes	(ii) acquire information from text files, including files of an unknown sizes		
(3) Research and information fluency. The student locates, analyzes, processes, and organizes data. The student is expected to:	(C) acquire and process information from text files, including files of known and an unknown sizes	(iii) process information from text files, including files of a known sizes		
(3) Research and information fluency. The student locates, analyzes, processes, and organizes data. The student is expected to:	(C) acquire and process information from text files, including files of known and an unknown sizes	(iv) process information from text files, including files of an unknown sizes		
(3) Research and information fluency. The student locates, analyzes, processes, and organizes data. The student is expected to:	(D) manipulate data structures using string processing			
(3) Research and information fluency. The student locates, analyzes, processes, and organizes data. The student is expected to:	(E) manipulate data values by casting between data types			

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TEKS (Knowledge and	Student Expectation	Breakout	Element	Subelement
(3) Research and information fluency. The student locates, analyzes, processes, and organizes data. The student is expected to:	(F) identify and use the structured data type of one-dimensional arrays to traverse, search, modify, insert, and delete data	(i) identify the structured data type of one-dimensional arrays to traverse data		
(3) Research and information fluency. The student locates, analyzes, processes, and organizes data. The student is expected to:	(F) identify and use the structured data type of one-dimensional arrays to traverse, search, modify, insert, and delete data	(ii) identify the structured data type of one-dimensional arrays to search data		
(3) Research and information fluency. The student locates, analyzes, processes, and organizes data. The student is expected to:	(F) identify and use the structured data type of one-dimensional arrays to traverse, search, modify, insert, and delete data	(iii) identify the structured data type of one-dimensional arrays to modify data		
(3) Research and information fluency. The student locates, analyzes, processes, and organizes data. The student is expected to:	(F) identify and use the structured data type of one-dimensional arrays to traverse, search, modify, insert, and delete data	(iv) identify the structured data type of one-dimensional arrays to insert data		
(3) Research and information fluency. The student locates, analyzes, processes, and organizes data. The student is expected to:	(F) identify and use the structured data type of one-dimensional arrays to traverse, search, modify, insert, and delete data	(v) identify the structured data type of one-dimensional arrays to delete data		
(3) Research and information fluency. The student locates, analyzes, processes, and organizes data. The student is expected to:	(F) identify and use the structured data type of one-dimensional arrays to traverse, search, modify, insert, and delete data	(vi) use the structured data type of one-dimensional arrays to traverse data		
(3) Research and information fluency. The student locates, analyzes, processes, and organizes data. The student is expected to:	(F) identify and use the structured data type of one-dimensional arrays to traverse, search, modify, insert, and delete data	(vii) use the structured data type of one-dimensional arrays to search data		

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Course Title	§126.34. Computer Science II (One Credit), Beginning with School Year 2012-2013			
TEKS (Knowledge and	Student Expectation	Breakout	Element	Subelement
(3) Research and information fluency. The student locates, analyzes, processes, and organizes data. The student is expected to:	(F) identify and use the structured data type of one-dimensional arrays to traverse, search, modify, insert, and delete data	(viii) use the structured data type of one-dimensional arrays to modify data		
(3) Research and information fluency. The student locates, analyzes, processes, and organizes data. The student is expected to:	(F) identify and use the structured data type of one-dimensional arrays to traverse, search, modify, insert, and delete data	(ix) use the structured data type of one-dimensional arrays to insert data		
(3) Research and information fluency. The student locates, analyzes, processes, and organizes data. The student is expected to:	(F) identify and use the structured data type of one-dimensional arrays to traverse, search, modify, insert, and delete data	(x) use the structured data type of one-dimensional arrays to delete data		
(3) Research and information fluency. The student locates, analyzes, processes, and organizes data. The student is expected to:	(G) identify and use the structured data type of two-dimensional arrays to traverse, search, modify, insert, and delete data	(i) identify the structured data type of two-dimensional arrays to traverse data		
(3) Research and information fluency. The student locates, analyzes, processes, and organizes data. The student is expected to:	(G) identify and use the structured data type of two-dimensional arrays to traverse, search, modify, insert, and delete data	(ii) identify the structured data type of two-dimensional arrays to search data		
(3) Research and information fluency. The student locates, analyzes, processes, and organizes data. The student is expected to:	(G) identify and use the structured data type of two-dimensional arrays to traverse, search, modify, insert, and delete data	(iii) identify the structured data type of two-dimensional arrays to modify data		
(3) Research and information fluency. The student locates, analyzes, processes, and organizes data. The student is expected to:	(G) identify and use the structured data type of two-dimensional arrays to traverse, search, modify, insert, and delete data	(iv) identify the structured data type of two-dimensional arrays to insert data		

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TEKS (Knowledge and	**Student Expectation**	**Breakout**	**Element**	**Subelement**
(3) Research and information fluency. The student locates, analyzes, processes, and organizes data. The student is expected to:	(G) identify and use the structured data type of two-dimensional arrays to traverse, search, modify, insert, and delete data	(v) identify the structured data type of two-dimensional arrays to delete data		
(3) Research and information fluency. The student locates, analyzes, processes, and organizes data. The student is expected to:	(G) identify and use the structured data type of two-dimensional arrays to traverse, search, modify, insert, and delete data	(vi) use the structured data type of two-dimensional arrays to traverse data		
(3) Research and information fluency. The student locates, analyzes, processes, and organizes data. The student is expected to:	(G) identify and use the structured data type of two-dimensional arrays to traverse, search, modify, insert, and delete data	(vii) use the structured data type of two-dimensional arrays to search data		
(3) Research and information fluency. The student locates, analyzes, processes, and organizes data. The student is expected to:	(G) identify and use the structured data type of two-dimensional arrays to traverse, search, modify, insert, and delete data	(viii) use the structured data type of two-dimensional arrays to modify data		
(3) Research and information fluency. The student locates, analyzes, processes, and organizes data. The student is expected to:	(G) identify and use the structured data type of two-dimensional arrays to traverse, search, modify, insert, and delete data	(ix) use the structured data type of two-dimensional arrays to insert data		
(3) Research and information fluency. The student locates, analyzes, processes, and organizes data. The student is expected to:	(G) identify and use the structured data type of two-dimensional arrays to traverse, search, modify, insert, and delete data	(x) use the structured data type of two-dimensional arrays to delete data		
(3) Research and information fluency. The student locates, analyzes, processes, and organizes data. The student is expected to:	(H) identify and use a list object data structure to traverse, search, insert, and delete data	(i) identify a list object data structure to traverse data		

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TEKS (Knowledge and	Student Expectation	Breakout	Element	Subelement
(3) Research and information fluency. The student locates, analyzes, processes, and organizes data. The student is expected to:	(H) identify and use a list object data structure to traverse, search, insert, and delete data	(ii) identify a list object data structure to search data		
(3) Research and information fluency. The student locates, analyzes, processes, and organizes data. The student is expected to:	(H) identify and use a list object data structure to traverse, search, insert, and delete data	(iii) identify a list object data structure to insert data		
(3) Research and information fluency. The student locates, analyzes, processes, and organizes data. The student is expected to:	(H) identify and use a list object data structure to traverse, search, insert, and delete data	(iv) identify a list object data structure to delete data		
(3) Research and information fluency. The student locates, analyzes, processes, and organizes data. The student is expected to:	(H) identify and use a list object data structure to traverse, search, insert, and delete data	(v) use a list object data structure to traverse data		
(3) Research and information fluency. The student locates, analyzes, processes, and organizes data. The student is expected to:	(H) identify and use a list object data structure to traverse, search, insert, and delete data	(vi) use a list object data structure to search data		
(3) Research and information fluency. The student locates, analyzes, processes, and organizes data. The student is expected to:	(H) identify and use a list object data structure to traverse, search, insert, and delete data	(vii) use a list object data structure to insert data		
(3) Research and information fluency. The student locates, analyzes, processes, and organizes data. The student is expected to:	(H) identify and use a list object data structure to traverse, search, insert, and delete data	(viii) use a list of object data structure to delete data		

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TEKS (Knowledge and	Student Expectation	Breakout	Element	Subelement
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(A) develop sequential algorithms using branching control statements, including nested structures, to create solutions to decision-making problems			
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(B) develop choice algorithms using selection control statements based on ordinal values			
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(C) demonstrate proficiency in the use of short-circuit evaluation			
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(D) demonstrate proficiency in the use of Boolean algebra, including De Morgan's Law			
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(E) develop iterative algorithms using nested loops			

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TEKS (Knowledge and	Student Expectation	Breakout	Element	Subelement
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(F) identify, trace, and appropriately use recursion in programming solutions, including algebraic computations	(i) identify recursion in programming solutions, including algebraic computations		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(F) identify, trace, and appropriately use recursion in programming solutions, including algebraic computations	(ii) trace recursion in programming solutions, including algebraic computations		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(F) identify, trace, and appropriately use recursion in programming solutions, including algebraic computations	(iii) appropriately use recursion in programming solutions, including algebraic computations		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(G) design, construct, evaluate, and compare search algorithms including linear searching and binary searching	(i) design search algorithms including linear searching		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(G) design, construct, evaluate, and compare search algorithms including linear searching and binary searching	(ii) design search algorithms including binary searching		

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TEKS (Knowledge and	Student Expectation	Breakout	Element	Subelement
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(G) design, construct, evaluate, and compare search algorithms including linear searching and binary searching	(iii) construct search algorithms including linear searching		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(G) design, construct, evaluate, and compare search algorithms including linear searching and binary searching	(iv) construct search algorithms including binary searching		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(G) design, construct, evaluate, and compare search algorithms including linear searching and binary searching	(v) evaluate search algorithms including linear searching		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(G) design, construct, evaluate, and compare search algorithms including linear searching and binary searching	(vi) evaluate search algorithms including binary searching		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(G) design, construct, evaluate, and compare search algorithms including linear searching and binary searching	(vii) compare search algorithms including linear searching and binary searching		

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TEKS (Knowledge and	**Student Expectation**	**Breakout**	**Element**	**Subelement**
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(H) identify, describe, design, create, evaluate, and compare standard sorting algorithms, including selection sort, bubble sort, insertion sort, and merge sort	(i) identify standard sorting algorithms, including selection sort		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(H) identify, describe, design, create, evaluate, and compare standard sorting algorithms, including selection sort, bubble sort, insertion sort, and merge sort	(ii) identify standard sorting algorithms, including bubble sort		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(H) identify, describe, design, create, evaluate, and compare standard sorting algorithms, including selection sort, bubble sort, insertion sort, and merge sort	(iii) identify standard sorting algorithms, including insertion sort		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(H) identify, describe, design, create, evaluate, and compare standard sorting algorithms, including selection sort, bubble sort, insertion sort, and merge sort	(iv) identify standard sorting algorithms, including merge sort		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(H) identify, describe, design, create, evaluate, and compare standard sorting algorithms, including selection sort, bubble sort, insertion sort, and merge sort	(v) describe standard sorting algorithms, including selection sort		

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TEKS (Knowledge and	Student Expectation	Breakout	Element	Subelement
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(H) identify, describe, design, create, evaluate, and compare standard sorting algorithms, including selection sort, bubble sort, insertion sort, and merge sort	(vi) describe standard sorting algorithms, including bubble sort		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(H) identify, describe, design, create, evaluate, and compare standard sorting algorithms, including selection sort, bubble sort, insertion sort, and merge sort	(vii) describe standard sorting algorithms, including insertion sort		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(H) identify, describe, design, create, evaluate, and compare standard sorting algorithms, including selection sort, bubble sort, insertion sort, and merge sort	(viii) describe standard sorting algorithms, including merge sort		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(H) identify, describe, design, create, evaluate, and compare standard sorting algorithms, including selection sort, bubble sort, insertion sort, and merge sort	(ix) design standard sorting algorithms, including selection sort		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(H) identify, describe, design, create, evaluate, and compare standard sorting algorithms, including selection sort, bubble sort, insertion sort, and merge sort	(x) design standard sorting algorithms, including bubble sort		

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TEKS (Knowledge and	Student Expectation	Breakout	Element	Subelement
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(H) identify, describe, design, create, evaluate, and compare standard sorting algorithms, including selection sort, bubble sort, insertion sort, and merge sort	(xi) design standard sorting algorithms, including insertion sort		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(H) identify, describe, design, create, evaluate, and compare standard sorting algorithms, including selection sort, bubble sort, insertion sort, and merge sort	(xii) design standard sorting algorithms, including merge sort		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(H) identify, describe, design, create, evaluate, and compare standard sorting algorithms, including selection sort, bubble sort, insertion sort, and merge sort	(xiii) create standard sorting algorithms, including selection sort		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(H) identify, describe, design, create, evaluate, and compare standard sorting algorithms, including selection sort, bubble sort, insertion sort, and merge sort	(xiv) create standard sorting algorithms, including bubble sort		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(H) identify, describe, design, create, evaluate, and compare standard sorting algorithms, including selection sort, bubble sort, insertion sort, and merge sort	(xv) create standard sorting algorithms, including insertion sort		

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TEKS (Knowledge and	Student Expectation	Breakout	Element	Subelement
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(H) identify, describe, design, create, evaluate, and compare standard sorting algorithms, including selection sort, bubble sort, insertion sort, and merge sort	(xvi) create standard sorting algorithms, including merge sort		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(H) identify, describe, design, create, evaluate, and compare standard sorting algorithms, including selection sort, bubble sort, insertion sort, and merge sort	(xvii) evaluate standard sorting algorithms, including selection sort		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(H) identify, describe, design, create, evaluate, and compare standard sorting algorithms, including selection sort, bubble sort, insertion sort, and merge sort	(xviii) evaluate standard sorting algorithms, including bubble sort		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(H) identify, describe, design, create, evaluate, and compare standard sorting algorithms, including selection sort, bubble sort, insertion sort, and merge sort	(xix) evaluate standard sorting algorithms, including insertion sort		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(H) identify, describe, design, create, evaluate, and compare standard sorting algorithms, including selection sort, bubble sort, insertion sort, and merge sort	(xx) evaluate standard sorting algorithms including merge sort		

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TEKS (Knowledge and	Student Expectation	Breakout	Element	Subelement
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(H) identify, describe, design, create, evaluate, and compare standard sorting algorithms, including selection sort, bubble sort, insertion sort, and merge sort	(xxi) compare standard sorting algorithms, including selection sort, bubble sort, insertion sort, and merge sort		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(I) measure time/space efficiency of various sorting algorithms			
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(J) compare and contrast search and sort algorithms, including linear, quadratic, and recursive strategies, for time/space efficiency	(i) compare search algorithms, including linear, quadratic, and recursive strategies, for time/space efficiency		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(J) compare and contrast search and sort algorithms, including linear, quadratic, and recursive strategies, for time/space efficiency	(ii) contrast search algorithms, including linear, quadratic, and recursive strategies, for time/space efficiency		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(J) compare and contrast search and sort algorithms, including linear, quadratic, and recursive strategies, for time/space efficiency	(iii) compare sort algorithms, including linear, quadratic, and recursive strategies, for time/space efficiency		

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TEKS (Knowledge and	Student Expectation	Breakout	Element	Subelement
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(J) compare and contrast search and sort algorithms, including linear, quadratic, and recursive strategies, for time/space efficiency	(iv) contrast sort algorithms, including linear, quadratic, and recursive strategies, for time/space efficiency		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(K) analyze algorithms using "big-O" notation, for best, average, and worst-case data patterns	(i) analyze algorithms using "big-O" notation, for best-case data patterns		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(K) analyze algorithms using "big-O" notation, for best, average, and worst-case data patterns	(ii) analyze algorithms using "big-O" notation, for average-case data patterns		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(K) analyze algorithms using "big-O" notation, for best, average, and worst-case data patterns	(iii) analyze algorithms using "big-O" notation, for worst-case data patterns		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(L) develop algorithms to solve various problems, including factoring, summing a series, finding the roots of a quadratic equation, and generating Fibonacci numbers	(i) develop algorithms to solve various problems including factoring		

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TEKS (Knowledge and	Student Expectation	Breakout	Element	Subelement
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(L) develop algorithms to solve various problems, including factoring, summing a series, finding the roots of a quadratic equation, and generating Fibonacci numbers	(ii) develop algorithms to solve various problems, including summing a series		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(L) develop algorithms to solve various problems, including factoring, summing a series, finding the roots of a quadratic equation, and generating Fibonacci numbers	(iii) develop algorithms to solve various problems including finding the roots of a quadratic equation		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(L) develop algorithms to solve various problems, including factoring, summing a series, finding the roots of a quadratic equation, and generating Fibonacci numbers	(iv) develop algorithms to solve various problems including generating Fibonacci numbers		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(M) test program solutions by investigating boundary conditions; testing classes, methods, and libraries in isolation; and performing stepwise refinement	(i) test program solutions by investigating boundary conditions		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(M) test program solutions by investigating boundary conditions; testing classes, methods, and libraries in isolation; and performing stepwise refinement	(ii) test program solutions by testing classes in isolation		

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TEKS (Knowledge and	Student Expectation	Breakout	Element	Subelement
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(M) test program solutions by investigating boundary conditions; testing classes, methods, and libraries in isolation; and performing stepwise refinement	(iii) test program solutions by testing methods in isolations		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(M) test program solutions by investigating boundary conditions; testing classes, methods, and libraries in isolation; and performing stepwise refinement	(iv) test program solutions by testing libraries in isolation		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(M) test program solutions by investigating boundary conditions; testing classes, methods, and libraries in isolation; and performing stepwise refinement	(v) test program solutions by performing stepwise refinement		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(N) identify and debug compile, syntax, runtime, and logic errors	(i) identify compile errors		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(N) identify and debug compile, syntax, runtime, and logic errors	(ii) debug compile errors		

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TEKS (Knowledge and	Student Expectation	Breakout	Element	Subelement
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(N) identify and debug compile, syntax, runtime, and logic errors	(iii) identify syntax errors		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(N) identify and debug compile, syntax, runtime, and logic errors	(iv) debug syntax errors		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(N) identify and debug compile, syntax, runtime, and logic errors	(v) identify runtime errors		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(N) identify and debug compile, syntax, runtime, and logic errors	(vi) debug runtime errors		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(N) identify and debug compile, syntax, runtime, and logic errors	(vii) identify logic errors		

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TEKS (Knowledge and	Student Expectation	Breakout	Element	Subelement
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(N) identify and debug compile, syntax, runtime, and logic errors	(viii) debug logic errors		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(O) compare and contrast algorithm efficiency by using informal runtime comparisons, exact calculation of statement execution counts, and theoretical efficiency values using "big-O" notation, including worst-case, best-case, and average-case time/space analysis	(i) compare algorithm efficiency by using informal runtime comparisons using "big-O" notations, including worst-case, best-case, and average-case time/space analysis		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(O) compare and contrast algorithm efficiency by using informal runtime comparisons, exact calculation of statement execution counts, and theoretical efficiency values using "big-O" notation, including worst-case, best-case, and average-case time/space analysis	(ii) compare algorithm efficiency by using exact calculation of statement execution counts using "big-O" notations, including worst-case, best-case, and average-case time/space analysis		

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TEKS (Knowledge and	**Student Expectation**	**Breakout**	**Element**	**Subelement**
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(O) compare and contrast algorithm efficiency by using informal runtime comparisons, exact calculation of statement execution counts, and theoretical efficiency values using "big-O" notation, including worst-case, best-case, and average-case time/space analysis	(iii) compare algorithm efficiency by using theoretical efficiency values using "big-O" notation, including worst-case, best-case, and average-case time/space analysis		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(O) compare and contrast algorithm efficiency by using informal runtime comparisons, exact calculation of statement execution counts, and theoretical efficiency values using "big-O" notation, including worst-case, best-case, and average-case time/space analysis	(iv) contrast algorithm efficiency by using informal runtime comparisons using "big-O" notations, including worst-case, best-case, and average-case time/space analysis		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(O) compare and contrast algorithm efficiency by using informal runtime comparisons, exact calculation of statement execution counts, and theoretical efficiency values using "big-O" notation, including worst-case, best-case, and average-case time/space analysis	(v) contrast algorithm efficiency by using exact calculation of statement execution counts using "big-O" notations, including worst-case, best-case, and average-case time/space analysis		

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TEKS (Knowledge and	Student Expectation	Breakout	Element	Subelement
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(O) compare and contrast algorithm efficiency by using informal runtime comparisons, exact calculation of statement execution counts, and theoretical efficiency values using "big-O" notation, including worst-case, best-case, and average-case time/space analysis	(vi) contrast algorithm efficiency by using theoretical efficiency values using "big-O" notation, including worst-case, best-case, and average-case time/space analysis		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(P) demonstrate the ability to count, convert, and perform mathematical operations in the binary and hexadecimal number systems	(i) demonstrate the ability to count in the binary number systems		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(P) demonstrate the ability to count, convert, and perform mathematical operations in the binary and hexadecimal number systems	(ii) demonstrate the ability to convert in the binary number systems		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(P) demonstrate the ability to count, convert, and perform mathematical operations in the binary and hexadecimal number systems	(iii) demonstrate the ability to perform mathematical operations in the binary number systems		

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TEKS (Knowledge and	**Student Expectation**	**Breakout**	**Element**	**Subelement**
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(P) demonstrate the ability to count, convert, and perform mathematical operations in the binary and hexadecimal number systems	(iv) demonstrate the ability to count in the hexadecimal number systems		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(P) demonstrate the ability to count, convert, and perform mathematical operations in the binary and hexadecimal number systems	(v) demonstrate the ability to convert in the hexadecimal number systems		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(P) demonstrate the ability to count, convert, and perform mathematical operations in the binary and hexadecimal number systems	(vi) demonstrate the ability to perform mathematical operations in the hexadecimal number systems		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(Q) demonstrate knowledge of the maximum integer boundary, minimum integer boundary, imprecision of real number representations, and round-off errors	(i) demonstrate knowledge of the maximum integer boundary		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(Q) demonstrate knowledge of the maximum integer boundary, minimum integer boundary, imprecision of real number representations, and round-off errors	(ii) demonstrate knowledge of the minimum integer boundary		

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TEKS (Knowledge and	Student Expectation	Breakout	Element	Subelement
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(Q) demonstrate knowledge of the maximum integer boundary, minimum integer boundary, imprecision of real number representations, and round-off errors	(iii) demonstrate knowledge of the imprecision of real number representations		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(Q) demonstrate knowledge of the maximum integer boundary, minimum integer boundary, imprecision of real number representations, and round-off errors	(iv) demonstrate knowledge of round-off errors		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(R) create program solutions to problems using the mathematics library class			
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(S) use random algorithm to create simulations that model the real world			
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(T) identify, understand, and create class specifications and relationships among classes, including composition and inheritance relationships	(i) identify class specifications, including composition relationships		

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TEKS (Knowledge and	Student Expectation	Breakout	Element	Subelement
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(T) identify, understand, and create class specifications and relationships among classes, including composition and inheritance relationships	(ii) identify class specifications, including inheritance relationships		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(T) identify, understand, and create class specifications and relationships among classes, including composition and inheritance relationships	(iii) understand class specifications, including composition relationships		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(T) identify, understand, and create class specifications and relationships among classes, including composition and inheritance relationships	(iv) understand class specifications, including inheritance relationships		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(T) identify, understand, and create class specifications and relationships among classes, including composition and inheritance relationships	(v) create class specifications, including composition relationships		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(T) identify, understand, and create class specifications and relationships among classes, including composition and inheritance relationships	(vi) create class specifications, including inheritance relationships		

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TEKS (Knowledge and	Student Expectation	Breakout	Element	Subelement
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(T) identify, understand, and create class specifications and relationships among classes, including composition and inheritance relationships	(vii) identify relationships among classes, including composition relationships		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(T) identify, understand, and create class specifications and relationships among classes, including composition and inheritance relationships	(viii) identify relationships among classes, including inheritance relationships		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(T) identify, understand, and create class specifications and relationships among classes, including composition and inheritance relationships	(ix) understand relationships among classes, including composition relationships		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(T) identify, understand, and create class specifications and relationships among classes, including composition and inheritance relationships	(x) understand relationships among classes, including inheritance relationships		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(T) identify, understand, and create class specifications and relationships among classes, including composition and inheritance relationships	(xi) create relationships among classes, including composition relationships		

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TEKS (Knowledge and	Student Expectation	Breakout	Element	Subelement
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(T) identify, understand, and create class specifications and relationships among classes, including composition and inheritance relationships	(xii) create relationships among classes, including inheritance relationships		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(U) understand and explain object relationships among defined classes, abstract classes, and interfaces	(i) understand object relationships among defined classes		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(U) understand and explain object relationships among defined classes, abstract classes, and interfaces	(ii) understand object relationships among abstract classes		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(U) understand and explain object relationships among defined classes, abstract classes, and interfaces	(iii) understand object relationships among interfaces		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(U) understand and explain object relationships among defined classes, abstract classes, and interfaces	(iv) explain object relationships among defined classes		

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TEKS (Knowledge and	**Student Expectation**	**Breakout**	**Element**	**Subelement**
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(U) understand and explain object relationships among defined classes, abstract classes, and interfaces	(v) explain object relationships among abstract classes		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(U) understand and explain object relationships among defined classes, abstract classes, and interfaces	(vi) explain object relationships among interfaces		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(V) create object-oriented definitions using class declarations, variable declarations, constant declarations, method declarations, parameter declarations, and interface declarations	(i) create object-oriented definitions using class declarations		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(V) create object-oriented definitions using class declarations, variable declarations, constant declarations, method declarations, parameter declarations, and interface declarations	(ii) create object-oriented definitions using variable declarations		

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TEKS (Knowledge and	**Student Expectation**	**Breakout**	**Element**	**Subelement**
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(V) create object-oriented definitions using class declarations, variable declarations, constant declarations, method declarations, parameter declarations, and interface declarations	(iii) create object-oriented definitions using constant declarations		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(V) create object-oriented definitions using class declarations, variable declarations, constant declarations, method declarations, parameter declarations, and interface declarations	(iv) create object-oriented definitions using method declarations		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(V) create object-oriented definitions using class declarations, variable declarations, constant declarations, method declarations, parameter declarations, and interface declarations	(v) create object-oriented definitions using parameter declarations		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(V) create object-oriented definitions using class declarations, variable declarations, constant declarations, method declarations, parameter declarations, and interface declarations	(vi) create object-oriented definitions using interface declarations		

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TEKS (Knowledge and	Student Expectation	Breakout	Element	Subelement
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(W) create robust classes that encapsulate data and the methods that operate on that data and incorporate overloading to enrich the object's behavior	(i) create robust classes that encapsulate data to enrich the object's behavior		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(W) create robust classes that encapsulate data and the methods that operate on that data and incorporate overloading to enrich the object's behavior	(ii) create robust classes that encapsulate the methods that operate on that data to enrich the object's behavior		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(W) create robust classes that encapsulate data and the methods that operate on that data and incorporate overloading to enrich the object's behavior	(iii) create robust classes that incorporate overloading to enrich the object's behavior		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(X) design and implement a set of interactive classes	(i) design a set of interactive classes		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(X) design and implement a set of interactive classes	(ii) implement a set of interactive classes		

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TEKS (Knowledge and	Student Expectation	Breakout	Element	Subelement
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(Y) design, create, and evaluate multiclass programs that use abstract classes and interfaces	(i) design multiclass programs that use abstract classes		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(Y) design, create, and evaluate multiclass programs that use abstract classes and interfaces	(ii) design multiclass programs that use interfaces		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(Y) design, create, and evaluate multiclass programs that use abstract classes and interfaces	(iii) create multiclass programs that use abstract classes		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(Y) design, create, and evaluate multiclass programs that use abstract classes and interfaces	(iv) create multiclass programs that use interfaces		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(Y) design, create, and evaluate multiclass programs that use abstract classes and interfaces	(v) evaluate multiclass programs that use abstract classes		

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TEKS (Knowledge and	Student Expectation	Breakout	Element	Subelement
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(Y) design, create, and evaluate multiclass programs that use abstract classes and interfaces	(vi) evaluate multiclass programs that use interfaces		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(Z) understand and implement a student-created class hierarchy	(i) understand a student-created class hierarchy		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(Z) understand and implement a student-created class hierarchy	(ii) implement a student-created class hierarchy		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(AA) extend, modify, and improve existing code using inheritance	(i) extend existing code using inheritance		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(AA) extend, modify, and improve existing code using inheritance	(ii) modify existing code using inheritance		

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TEKS (Knowledge and	Student Expectation	Breakout	Element	Subelement
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(AA) extend, modify, and improve existing code using inheritance	(iii) improve existing code using inheritance		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(BB) create adaptive behaviors, including overloading, using polymorphism			
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(CC) understand and use reference variables for object and string data types	(i) understand reference variables for object data types		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(CC) understand and use reference variables for object and string data types	(ii) understand reference variables for string data types		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(CC) understand and use reference variables for object and string data types	(iii) use reference variables for object data types		

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TEKS (Knowledge and	Student Expectation	Breakout	Element	Subelement
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(CC) understand and use reference variables for object and string data types	(iv) use reference variables for string data types		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(DD) understand and implement access scope modifiers	(i) understand access scope modifiers		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(DD) understand and implement access scope modifiers	(ii) implement access scope modifiers		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(EE) understand and demonstrate how to compare objects	(i) understand how to compare objects		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(EE) understand and demonstrate how to compare objects	(ii) demonstrate how to compare objects		

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TEKS (Knowledge and	Student Expectation	Breakout	Element	Subelement
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(FF) duplicate objects using the appropriate deep and/or shallow copy			
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(GG) define and implement abstract classes and interfaces in program problem solutions	(i) define abstract classes in program problem solutions		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(GG) define and implement abstract classes and interfaces in program problem solutions	(ii) define interfaces in program problem solutions		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(GG) define and implement abstract classes and interfaces in program problem solutions	(iii) implement abstract classes in program problem solutions		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(GG) define and implement abstract classes and interfaces in program problem solutions	(iv) implement interfaces in program problem solutions		

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TEKS (Knowledge and	Student Expectation	Breakout	Element	Subelement
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(HH) apply functional decomposition to a program solution			
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(II) create simple and robust objects from class definitions through instantiation	(i) create simple objects from class definitions through instantiation		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(II) create simple and robust objects from class definitions through instantiation	(ii) create robust objects from class definitions through instantiation		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(JJ) apply class membership of variables, constants, and methods	(i) apply class membership of variables		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(JJ) apply class membership of variables, constants, and methods	(ii) apply class membership of constants		

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TEKS (Knowledge and	Student Expectation	Breakout	Element	Subelement
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(JJ) apply class membership of variables, constants, and methods	(iii) apply class membership of methods		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(KK) examine and mutate the properties of an object using accessors and modifiers	(i) examine the properties of an object using accessors		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(KK) examine and mutate the properties of an object using accessors and modifiers	(ii) examine the properties of an object using modifiers		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(KK) examine and mutate the properties of an object using accessors and modifiers	(iii) mutate the properties of an object using accessors		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(KK) examine and mutate the properties of an object using accessors and modifiers	(iv) mutate the properties of an object using modifiers		

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TEKS (Knowledge and	Student Expectation	Breakout	Element	Subelement
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(LL) understand and implement a composite class	(i) understand a composite class		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(LL) understand and implement a composite class	(ii) implement a composite class		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(MM) design and implement an interface	(i) design an interface		
(4) Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:	(MM) design and implement an interface	(ii) implement an interface		
(5) Digital citizenship. The student explores and understands safety, legal, cultural, and societal issues relating to the use of technology and information. The student is expected to:	(A) model ethical acquisition and use of digital information	(i) model ethical acquisition of digital information		

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TEKS (Knowledge and	**Student Expectation**	**Breakout**	**Element**	**Subelement**
(5) Digital citizenship. The student explores and understands safety, legal, cultural, and societal issues relating to the use of technology and information. The student is expected to:	(A) model ethical acquisition and use of digital information	(ii) model ethical use of digital information		
(5) Digital citizenship. The student explores and understands safety, legal, cultural, and societal issues relating to the use of technology and information. The student is expected to:	(B) demonstrate proper digital etiquette, responsible use of software, and knowledge of acceptable use policies	(i) demonstrate proper digital etiquette		
(5) Digital citizenship. The student explores and understands safety, legal, cultural, and societal issues relating to the use of technology and information. The student is expected to:	(B) demonstrate proper digital etiquette, responsible use of software, and knowledge of acceptable use policies	(ii) demonstrate responsible use of software		
(5) Digital citizenship. The student explores and understands safety, legal, cultural, and societal issues relating to the use of technology and information. The student is expected to:	(B) demonstrate proper digital etiquette, responsible use of software, and knowledge of acceptable use policies	(iii) demonstrate knowledge of acceptable use policies		
(5) Digital citizenship. The student explores and understands safety, legal, cultural, and societal issues relating to the use of technology and information. The student is expected to:	(C) investigate digital rights management			

Subject	**§126.Technology Applications**			
Course Title	**§126.34. Computer Science II (One Credit), Beginning with School Year 2012-2013**			
TEKS (Knowledge and	**Student Expectation**	**Breakout**	**Element**	**Subelement**
(6) Technology operations and concepts. The student understands technology concepts, systems, and operations as they apply to computer science. The student is expected to:	(A) compare and contrast types of operating systems, software applications, hardware platforms, and programming languages	(i) compare types of operating systems		
(6) Technology operations and concepts. The student understands technology concepts, systems, and operations as they apply to computer science. The student is expected to:	(A) compare and contrast types of operating systems, software applications, hardware platforms, and programming languages	(ii) compare types of software applications		
(6) Technology operations and concepts. The student understands technology concepts, systems, and operations as they apply to computer science. The student is expected to:	(A) compare and contrast types of operating systems, software applications, hardware platforms, and programming languages	(iii) compare types of hardware platforms		
(6) Technology operations and concepts. The student understands technology concepts, systems, and operations as they apply to computer science. The student is expected to:	(A) compare and contrast types of operating systems, software applications, hardware platforms, and programming languages	(iv) compare types of programming languages		

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TEKS (Knowledge and	Student Expectation	Breakout	Element	Subelement
(6) Technology operations and concepts. The student understands technology concepts, systems, and operations as they apply to computer science. The student is expected to:	(A) compare and contrast types of operating systems, software applications, hardware platforms, and programming languages	(v) contrast types of operating systems		
(6) Technology operations and concepts. The student understands technology concepts, systems, and operations as they apply to computer science. The student is expected to:	(A) compare and contrast types of operating systems, software applications, hardware platforms, and programming languages	(vi) contrast types of software applications		
(6) Technology operations and concepts. The student understands technology concepts, systems, and operations as they apply to computer science. The student is expected to:	(A) compare and contrast types of operating systems, software applications, hardware platforms, and programming languages	(vii) contrast types of hardware platforms		
(6) Technology operations and concepts. The student understands technology concepts, systems, and operations as they apply to computer science. The student is expected to:	(A) compare and contrast types of operating systems, software applications, hardware platforms, and programming languages	(viii) contrast types of programming languages		
(6) Technology operations and concepts. The student understands technology concepts, systems, and operations as they apply to computer science. The student is expected to:	(B) demonstrate knowledge of major hardware components, including primary and secondary memory, a central processing unit (CPU), and peripherals	(i) demonstrate knowledge of major hardware components, including primary memory		

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TEKS (Knowledge and	Student Expectation	Breakout	Element	Subelement
(6) Technology operations and concepts. The student understands technology concepts, systems, and operations as they apply to computer science. The student is expected to:	(B) demonstrate knowledge of major hardware components, including primary and secondary memory, a central processing unit (CPU), and peripherals	(ii) demonstrate knowledge of major hardware components, including secondary memory		
(6) Technology operations and concepts. The student understands technology concepts, systems, and operations as they apply to computer science. The student is expected to:	(B) demonstrate knowledge of major hardware components, including primary and secondary memory, a central processing unit (CPU), and peripherals	(iii) demonstrate knowledge of major hardware components, including a central processing unit (CPU)		
(6) Technology operations and concepts. The student understands technology concepts, systems, and operations as they apply to computer science. The student is expected to:	(B) demonstrate knowledge of major hardware components, including primary and secondary memory, a central processing unit (CPU), and peripherals	(iv) demonstrate knowledge of major hardware components, including peripherals		
(6) Technology operations and concepts. The student understands technology concepts, systems, and operations as they apply to computer science. The student is expected to:	(C) demonstrate knowledge of major networking components, including hosts, servers, switches, and routers	(i) demonstrate knowledge of major networking components, including hosts		
(6) Technology operations and concepts. The student understands technology concepts, systems, and operations as they apply to computer science. The student is expected to:	(C) demonstrate knowledge of major networking components, including hosts, servers, switches, and routers	(ii) demonstrate knowledge of major networking components, including servers		

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TEKS (Knowledge and	Student Expectation	Breakout	Element	Subelement
(6) Technology operations and concepts. The student understands technology concepts, systems, and operations as they apply to computer science. The student is expected to:	(C) demonstrate knowledge of major networking components, including hosts, servers, switches, and routers	(iii) demonstrate knowledge of major networking components, including switches		
(6) Technology operations and concepts. The student understands technology concepts, systems, and operations as they apply to computer science. The student is expected to:	(C) demonstrate knowledge of major networking components, including hosts, servers, switches, and routers	(iv) demonstrate knowledge of major networking components, including routers		
(6) Technology operations and concepts. The student understands technology concepts, systems, and operations as they apply to computer science. The student is expected to:	(D) demonstrate knowledge of computer communication systems, including single-user, peer-to-peer, workgroup, client-server, and networked	(i) demonstrate knowledge of computer communication systems, including single-user		
(6) Technology operations and concepts. The student understands technology concepts, systems, and operations as they apply to computer science. The student is expected to:	(D) demonstrate knowledge of computer communication systems, including single-user, peer-to-peer, workgroup, client-server, and networked	(ii) demonstrate knowledge of computer communication systems, including peer-to-peer		
(6) Technology operations and concepts. The student understands technology concepts, systems, and operations as they apply to computer science. The student is expected to:	(D) demonstrate knowledge of computer communication systems, including single-user, peer-to-peer, workgroup, client-server, and networked	(iii) demonstrate knowledge of computer communication systems, including workgroup		

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TEKS (Knowledge and	**Student Expectation**	**Breakout**	**Element**	**Subelement**
(6) Technology operations and concepts. The student understands technology concepts, systems, and operations as they apply to computer science. The student is expected to:	(D) demonstrate knowledge of computer communication systems, including single-user, peer-to-peer, workgroup, client-server, and networked	(iv) demonstrate knowledge of computer communication systems, including client-server		
(6) Technology operations and concepts. The student understands technology concepts, systems, and operations as they apply to computer science. The student is expected to:	(D) demonstrate knowledge of computer communication systems, including single-user, peer-to-peer, workgroup, client-server, and networked	(v) demonstrate knowledge of computer communication systems, including networked		
(6) Technology operations and concepts. The student understands technology concepts, systems, and operations as they apply to computer science. The student is expected to:	(E) demonstrate knowledge of computer addressing systems, including Internet Protocol (IP) address and Media Access Control (MAC) address	(i) demonstrate knowledge of computer addressing systems, including Internet Protocol address		
(6) Technology operations and concepts. The student understands technology concepts, systems, and operations as they apply to computer science. The student is expected to:	(E) demonstrate knowledge of computer addressing systems, including Internet Protocol (IP) address and Media Access Control (MAC) address	(ii) demonstrate knowledge of computer addressing systems, including Machine Access Code address		
(6) Technology operations and concepts. The student understands technology concepts, systems, and operations as they apply to computer science. The student is expected to:	(F) differentiate among the categories of programming languages, including machine, assembly, high-level compiled, high-level interpreted, and scripted	(i) differentiate among the categories of programming languages, including machine, assembly, high-level compiled, high-level interpreted, and scripted		