Subject	**§126.Technology Applications**			
Course Title	**§126.38. Game Programming and Design (One-Half to One Credit), Beginning with School Year 2012-2013**			
TEKS (Knowledge and Skills)	**Student Expectation**	**Breakout**	**Element**	**Subelement**
(a) General Requirements. Students shall be awarded one-half to one credit for successful completion of this course. The required prerequisite for this course is Algebra (I) This course is recommended for students in Grades 9-12.				
(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) Game Programming and Design will foster student creativity and innovation by presenting students with 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 gaming problems. Through data analysis, students will include the identification of task requirements, plan search strategies, and use programming concepts to access, analyze, and evaluate information needed to design games. By acquiring programming 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 create a computer game that is presented to an evaluation panel. (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) understand the basic game design elements, including conceptual ideas, storyline, visualization, storyboard, game effects, sound elements, game play, game controls, and player tutorial	(i) understand the basic game design elements, including conceptual ideas		
(1) Creativity and innovation. The student develops products and generates new understanding by extending existing knowledge. The student is expected to:	(A) understand the basic game design elements, including conceptual ideas, storyline, visualization, storyboard, game effects, sound elements, game play, game controls, and player tutorial	(ii) understand the basic game design elements, including storyline		

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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:	(A) understand the basic game design elements, including conceptual ideas, storyline, visualization, storyboard, game effects, sound elements, game play, game controls, and player tutorial	(iii) understand the basic game design elements, including visualization		
(1) Creativity and innovation. The student develops products and generates new understanding by extending existing knowledge. The student is expected to:	(A) understand the basic game design elements, including conceptual ideas, storyline, visualization, storyboard, game effects, sound elements, game play, game controls, and player tutorial	(iv) understand the basic game design elements, including storyboard		
(1) Creativity and innovation. The student develops products and generates new understanding by extending existing knowledge. The student is expected to:	(A) understand the basic game design elements, including conceptual ideas, storyline, visualization, storyboard, game effects, sound elements, game play, game controls, and player tutorial	(v) understand the basic game design elements, including game effects		
(1) Creativity and innovation. The student develops products and generates new understanding by extending existing knowledge. The student is expected to:	(A) understand the basic game design elements, including conceptual ideas, storyline, visualization, storyboard, game effects, sound elements, game play, game controls, and player tutorial	(vi) understand the basic game design elements, including sound elements		

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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:	(A) understand the basic game design elements, including conceptual ideas, storyline, visualization, storyboard, game effects, sound elements, game play, game controls, and player tutorial	(vii) understand the basic game design elements, including game play		
(1) Creativity and innovation. The student develops products and generates new understanding by extending existing knowledge. The student is expected to:	(A) understand the basic game design elements, including conceptual ideas, storyline, visualization, storyboard, game effects, sound elements, game play, game controls, and player tutorial	(viii) understand the basic game design elements, including game controls		
(1) Creativity and innovation. The student develops products and generates new understanding by extending existing knowledge. The student is expected to:	(A) understand the basic game design elements, including conceptual ideas, storyline, visualization, storyboard, game effects, sound elements, game play, game controls, and player tutorial	(ix) understand the basic game design elements, including player tutorial		
(1) Creativity and innovation. The student develops products and generates new understanding by extending existing knowledge. The student is expected to:	(B) create a design concept document			
(1) Creativity and innovation. The student develops products and generates new understanding by extending existing knowledge. The student is expected to:	(C) create a storyboard			

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TEKS (Knowledge and Skills)	**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:	(D) demonstrate an understanding of the fundamentals of game art, including the look and feel, graphics coordinate system, basics of color, and color palettes	(i) demonstrate an understanding the fundamentals of game art, including the look and feel		
(1) Creativity and innovation. The student develops products and generates new understanding by extending existing knowledge. The student is expected to:	(D) demonstrate an understanding of the fundamentals of game art, including the look and feel, graphics coordinate system, basics of color, and color palettes	(ii) demonstrate an understanding the fundamentals of game art, including graphics coordinate system		
(1) Creativity and innovation. The student develops products and generates new understanding by extending existing knowledge. The student is expected to:	(D) demonstrate an understanding of the fundamentals of game art, including the look and feel, graphics coordinate system, basics of color, and color palettes	(iii) demonstrate an understanding the fundamentals of game art, including basics of color		
(1) Creativity and innovation. The student develops products and generates new understanding by extending existing knowledge. The student is expected to:	(D) demonstrate an understanding of the fundamentals of game art, including the look and feel, graphics coordinate system, basics of color, and color palettes	(iv) demonstrate an understanding the fundamentals of game art, including color palettes		
(1) Creativity and innovation. The student develops products and generates new understanding by extending existing knowledge. The student is expected to:	(E) use bitmap graphics images, including designing, creating, reading, and manipulating images	(i) use bitmap graphics images, including designing images		

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TEKS (Knowledge and Skills)	**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) use bitmap graphics images, including designing, creating, reading, and manipulating images	(ii) use bitmap graphics images, including creating images		
(1) Creativity and innovation. The student develops products and generates new understanding by extending existing knowledge. The student is expected to:	(E) use bitmap graphics images, including designing, creating, reading, and manipulating images	(iii) use bitmap graphics images, including reading images		
(1) Creativity and innovation. The student develops products and generates new understanding by extending existing knowledge. The student is expected to:	(E) use bitmap graphics images, including designing, creating, reading, and manipulating images	(iv) use bitmap graphics images, including manipulating images		
(1) Creativity and innovation. The student develops products and generates new understanding by extending existing knowledge. The student is expected to:	(F) create backgrounds, including solid, image, and tiled backgrounds	(i) create backgrounds, including solid backgrounds		
(1) Creativity and innovation. The student develops products and generates new understanding by extending existing knowledge. The student is expected to:	(F) create backgrounds, including solid, image, and tiled backgrounds	(ii) create backgrounds, including image backgrounds		
(1) Creativity and innovation. The student develops products and generates new understanding by extending existing knowledge. The student is expected to:	(F) create backgrounds, including solid, image, and tiled backgrounds	(iii) create backgrounds, including tiled backgrounds		

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TEKS (Knowledge and Skills)	**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) write programs creating images using geometric shapes			
(1) Creativity and innovation. The student develops products and generates new understanding by extending existing knowledge. The student is expected to:	(H) create games using sprites by evaluating the role of sprites, creating sprites, and managing sprites	(i) create games using sprites by evaluating the role of sprites		
(1) Creativity and innovation. The student develops products and generates new understanding by extending existing knowledge. The student is expected to:	(H) create games using sprites by evaluating the role of sprites, creating sprites, and managing sprites	(ii) create games using sprites by creating sprites		
(1) Creativity and innovation. The student develops products and generates new understanding by extending existing knowledge. The student is expected to:	(H) create games using sprites by evaluating the role of sprites, creating sprites, and managing sprites	(iii) create games using sprites by managing sprites		
(1) Creativity and innovation. The student develops products and generates new understanding by extending existing knowledge. The student is expected to:	(I) create programs using sprite sheets			
(1) Creativity and innovation. The student develops products and generates new understanding by extending existing knowledge. The student is expected to:	(J) demonstrate an understanding of image rendering, including transparency, refresh rate, hardware acceleration, and animation	(i) demonstrate an understanding of image rendering, including transparency		

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TEKS (Knowledge and Skills)	**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:	(J) demonstrate an understanding of image rendering, including transparency, refresh rate, hardware acceleration, and animation	(ii) demonstrate an understanding of image rendering, including refresh rate		
(1) Creativity and innovation. The student develops products and generates new understanding by extending existing knowledge. The student is expected to:	(J) demonstrate an understanding of image rendering, including transparency, refresh rate, hardware acceleration, and animation	(iii) demonstrate an understanding of image rendering, including hardware acceleration		
(1) Creativity and innovation. The student develops products and generates new understanding by extending existing knowledge. The student is expected to:	(J) demonstrate an understanding of image rendering, including transparency, refresh rate, hardware acceleration, and animation	(iv) demonstrate an understanding of image rendering, including animation		
(1) Creativity and innovation. The student develops products and generates new understanding by extending existing knowledge. The student is expected to:	(K) find, create, and edit game audio sound effects and music	(i) find game audio sound effects		
(1) Creativity and innovation. The student develops products and generates new understanding by extending existing knowledge. The student is expected to:	(K) find, create, and edit game audio sound effects and music	(ii) create game audio sound effects		
(1) Creativity and innovation. The student develops products and generates new understanding by extending existing knowledge. The student is expected to:	(K) find, create, and edit game audio sound effects and music	(iii) edit game audio sound effects		

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TEKS (Knowledge and Skills)	**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:	(K) find, create, and edit game audio sound effects and music	(iv) find game audio music		
(1) Creativity and innovation. The student develops products and generates new understanding by extending existing knowledge. The student is expected to:	(K) find, create, and edit game audio sound effects and music	(v) create game audio music		
(1) Creativity and innovation. The student develops products and generates new understanding by extending existing knowledge. The student is expected to:	(K) find, create, and edit game audio sound effects and music	(vi) edit game audio music		
(1) Creativity and innovation. The student develops products and generates new understanding by extending existing knowledge. The student is expected to:	(L) implement game sound mechanics, including playing, pausing, and looping	(i) implement game sound mechanics, including playing sound		
(1) Creativity and innovation. The student develops products and generates new understanding by extending existing knowledge. The student is expected to:	(L) implement game sound mechanics, including playing, pausing, and looping	(ii) implement game sound mechanics, including pausing sound		
(1) Creativity and innovation. The student develops products and generates new understanding by extending existing knowledge. The student is expected to:	(L) implement game sound mechanics, including playing, pausing, and looping	(iii) implement game sound mechanics, including looping sound		

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TEKS (Knowledge and Skills)	**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) design and implement procedures to set timelines for, track progress of, and evaluate a game product	(i) design procedures to set timelines for a game product		
(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) design and implement procedures to set timelines for, track progress of, and evaluate a game product	(ii) implement procedures to set timelines for a game product		
(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) design and implement procedures to set timelines for, track progress of, and evaluate a game product	(iii) design procedures to track progress of a game product		
(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) design and implement procedures to set timelines for, track progress of, and evaluate a game product	(iv) implement procedures to track progress of a game product		

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TEKS (Knowledge and Skills)	**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) design and implement procedures to set timelines for, track progress of, and evaluate a game product	(v) design procedures to evaluate a game product		
(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) design and implement procedures to set timelines for, track progress of, and evaluate a game product	(vi) implement procedures to evaluate a game product		
(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) seek and respond to input from peers and professionals in evaluating a game project	(i) seek input from peers in evaluating a game project		
(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) seek and respond to input from peers and professionals in evaluating a game project	(ii) seek input from professionals in evaluating a game project		

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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) seek and respond to input from peers and professionals in evaluating a game project	(iii) respond to input from peers in evaluating a game project		
(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) seek and respond to input from peers and professionals in evaluating a game project	(iv) respond to input from professionals in evaluating a game project		
(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) demonstrate knowledge and appropriate use of operating systems, program development tools, and networking resources	(i) demonstrate knowledge of operating systems		
(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) demonstrate knowledge and appropriate use of operating systems, program development tools, and networking resources	(ii) demonstrate knowledge of program development tools		

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TEKS (Knowledge and Skills)	**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:	(C) demonstrate knowledge and appropriate use of operating systems, program development tools, and networking resources	(iii) demonstrate knowledge of networking resources		
(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) demonstrate knowledge and appropriate use of operating systems, program development tools, and networking resources	(iv) demonstrate appropriate use of operating systems		
(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) demonstrate knowledge and appropriate use of operating systems, program development tools, and networking resources	(v) demonstrate appropriate use of program development tools		
(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) demonstrate knowledge and appropriate use of operating systems, program development tools, and networking resources	(vi) demonstrate appropriate use of networking resources		

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TEKS (Knowledge and Skills)	**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:	(D) use network resources to acquire, organize, maintain, and evaluate information	(i) use network resources to acquire information		
(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) use network resources to acquire, organize, maintain, and evaluate information	(ii) use network resources to organize information		
(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) use network resources to acquire, organize, maintain, and evaluate information	(iii) use network resources to maintain information		
(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) use network resources to acquire, organize, maintain, and evaluate information	(iv) use network resources to evaluate information		

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TEKS (Knowledge and Skills)	**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:	(E) collaborate to research the business of games, including the roles of developer, marketing, publisher, and retail sales	(i) collaborate to research the business of games, including the roles of developer		
(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) collaborate to research the business of games, including the roles of developer, marketing, publisher, and retail sales	(ii) collaborate to research the business of games, including the roles of marketing		
(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) collaborate to research the business of games, including the roles of developer, marketing, publisher, and retail sales	(iii) collaborate to research the business of games, including the roles of publisher		
(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) collaborate to research the business of games, including the roles of developer, marketing, publisher, and retail sales	(iv) collaborate to research the business of games, including the roles of retail sales		

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TEKS (Knowledge and Skills)	**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:	(F) demonstrate an understanding of and evaluate online technology, including online interaction and massive multiplayer games	(i) demonstrate an understanding of online technology, including online interaction		
(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) demonstrate an understanding of and evaluate online technology, including online interaction and massive multiplayer games	(ii) demonstrate an understanding of online technology, including massive multiplayer games		
(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) demonstrate an understanding of and evaluate online technology, including online interaction and massive multiplayer games	(iii) evaluate online technology, including online interaction		
(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) demonstrate an understanding of and evaluate online technology, including online interaction and massive multiplayer games	(iv) evaluate online technology, including massive multiplayer games		

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TEKS (Knowledge and Skills)	**Student Expectation**	**Breakout**	**Element**	**Subelement**
(3) Research and information fluency. The student locates, analyzes, processes, and organizes data. The student is expected to	(A) play board games to research and collect game play data	(i) play board games to research game play data		
(3) Research and information fluency. The student locates, analyzes, processes, and organizes data. The student is expected to	(A) play board games to research and collect game play data	(ii) play board games to collect game play data		
(3) Research and information fluency. The student locates, analyzes, processes, and organizes data. The student is expected to	(B) evaluate, analyze, and document game styles and playability	(i) evaluate game styles		
(3) Research and information fluency. The student locates, analyzes, processes, and organizes data. The student is expected to	(B) evaluate, analyze, and document game styles and playability	(ii) analyze game styles		
(3) Research and information fluency. The student locates, analyzes, processes, and organizes data. The student is expected to	(B) evaluate, analyze, and document game styles and playability	(iii) document game styles		
(3) Research and information fluency. The student locates, analyzes, processes, and organizes data. The student is expected to	(B) evaluate, analyze, and document game styles and playability	(iv) evaluate game playability		
(3) Research and information fluency. The student locates, analyzes, processes, and organizes data. The student is expected to	(B) evaluate, analyze, and document game styles and playability	(v) analyze game playability		

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TEKS (Knowledge and Skills)	**Student Expectation**	**Breakout**	**Element**	**Subelement**
(3) Research and information fluency. The student locates, analyzes, processes, and organizes data. The student is expected to	(B) evaluate, analyze, and document game styles and playability	(vi) document game playability		
(3) Research and information fluency. The student locates, analyzes, processes, and organizes data. The student is expected to	(C) research the dramatic elements in games, including kinds of fun, player types, and nonlinear storytelling	(i) research the dramatic elements in games, including kinds of fun		
(3) Research and information fluency. The student locates, analyzes, processes, and organizes data. The student is expected to	(C) research the dramatic elements in games, including kinds of fun, player types, and nonlinear storytelling	(ii) research the dramatic elements in games, including player types		
(3) Research and information fluency. The student locates, analyzes, processes, and organizes data. The student is expected to	(C) research the dramatic elements in games, including kinds of fun, player types, and nonlinear storytelling	(iii) research the dramatic elements in games, including nonlinear storytelling		
(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) demonstrate an understanding of the game design process, including generating ideas, brainstorming, and paper prototyping	(i) demonstrate an understanding of the game design process, including generating ideas		
(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) demonstrate an understanding of the game design process, including generating ideas, brainstorming, and paper prototyping	(ii) demonstrate an understanding of the game design process, including brainstorming		

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(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) demonstrate an understanding of the game design process, including generating ideas, brainstorming, and paper prototyping	(iii) demonstrate an understanding of the game design process, including paper prototyping		
(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) write programs using variables of different 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	(C) evaluate game rules and instructions	(i) evaluate game rules		
(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) evaluate game rules and instructions	(ii) evaluate game instructions		
(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 an understanding of the user experience by comparing rules and game-play patterns	(i) demonstrate an understanding of the user experience by comparing rules		

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(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 an understanding of the user experience by comparing rules and game-play patterns	(ii) demonstrate an understanding of the user experience by comparing game-play 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	(E) write game rules, and instructions	(i) write game rules		
(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) write game rules, and instructions	(ii) write game instructions		
(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) develop game software			
(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) write computer game code, resolve game defects, and revise existing game code	(i) write computer game code		

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TEKS (Knowledge and Skills)	**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) write computer game code, resolve game defects, and revise existing game code	(ii) resolve game defects		
(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) write computer game code, resolve game defects, and revise existing game code	(iii) revise existing game code		
(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) test a finished game product by implementing sound testing techniques			
(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) explore intellectual property, privacy, sharing of information, copyright laws, and software licensing agreements	(i) explore intellectual property		
(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) explore intellectual property, privacy, sharing of information, copyright laws, and software licensing agreements	(ii) explore privacy		

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TEKS (Knowledge and Skills)	**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) explore intellectual property, privacy, sharing of information, copyright laws, and software licensing agreements	(iii) explore sharing of 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	(A) explore intellectual property, privacy, sharing of information, copyright laws, and software licensing agreements	(iii) explore copyright laws		
(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) explore intellectual property, privacy, sharing of information, copyright laws, and software licensing agreements	(iv) explore software licensing agreements		
(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) model ethical acquisition and use of digital information	(i) model ethical acquisition 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) model ethical acquisition and use of digital information	(ii) model ethical use of digital information		

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TEKS (Knowledge and Skills)	**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	(C) demonstrate proper digital etiquette when using networks, responsible use of software, and knowledge of acceptable use policies	(i) demonstrate proper etiquette when using networks		
(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) demonstrate proper digital etiquette when using networks, 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	(C) demonstrate proper digital etiquette when using networks, 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	(D) model respect of intellectual property, including manipulating graphics, morphing graphics, editing graphics, and editing sound	(i) model respect of intellectual property, including manipulating graphics		
(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	(D) model respect of intellectual property, including manipulating graphics, morphing graphics, editing graphics, and editing sound	(ii) model respect of intellectual property, including morphing graphics		

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TEKS (Knowledge and Skills)	**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	(D) model respect of intellectual property, including manipulating graphics, morphing graphics, editing graphics, and editing sound	(iii) model respect of intellectual property, including editing graphics		
(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	(D) model respect of intellectual property, including manipulating graphics, morphing graphics, editing graphics, and editing sound	(iv) model respect of intellectual property, including editing sound		
(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	(E) discuss and evaluate the social issues surrounding gaming	(i) discuss the social issues surrounding gaming		
(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	(E) discuss and evaluate the social issues surrounding gaming	(ii) evaluate the social issues surrounding gaming		
(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	(F) evaluate the cultural aspects of game design fundamentals, including rationale for games and types of games	(i) evaluate the cultural aspects of game design fundamentals, including rationale for games		

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TEKS (Knowledge and Skills)	**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	(F) evaluate the cultural aspects of game design fundamentals, including rationale for games and types of games	(ii) evaluate the cultural aspects of game design fundamentals, including types of games		
(6) Technology operations and concepts: The student understands technology concepts, systems, and operations as they apply to game programming. The student is expected to	(A) identify basic game components, including the game engine, game play subsystems, data structures, models, and interfaces	(i) identify basic game components, including the game engine		
(6) Technology operations and concepts: The student understands technology concepts, systems, and operations as they apply to game programming. The student is expected to	(A) identify basic game components, including the game engine, game play subsystems, data structures, models, and interfaces	(ii) identify basic game components, including game play subsystems		
(6) Technology operations and concepts: The student understands technology concepts, systems, and operations as they apply to game programming. The student is expected to	(A) identify basic game components, including the game engine, game play subsystems, data structures, models, and interfaces	(iii) identify basic game components, including data structures		
(6) Technology operations and concepts: The student understands technology concepts, systems, and operations as they apply to game programming. The student is expected to	(A) identify basic game components, including the game engine, game play subsystems, data structures, models, and interfaces	(iv) identify basic game components, including models		

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TEKS (Knowledge and Skills)	**Student Expectation**	**Breakout**	**Element**	**Subelement**
(6) Technology operations and concepts: The student understands technology concepts, systems, and operations as they apply to game programming. The student is expected to	(A) identify basic game components, including the game engine, game play subsystems, data structures, models, and interfaces	(v) identify basic game components, including interfaces		
(6) Technology operations and concepts: The student understands technology concepts, systems, and operations as they apply to game programming. The student is expected to	(B) generate random numbers in a program			
(6) Technology operations and concepts: The student understands technology concepts, systems, and operations as they apply to game programming. The student is expected to	(C) create a program implementing conditional statements			
(6) Technology operations and concepts: The student understands technology concepts, systems, and operations as they apply to game programming. The student is expected to	(D) develop an appropriate data model			
(6) Technology operations and concepts: The student understands technology concepts, systems, and operations as they apply to game programming. The student is expected to	(E) demonstrate an understanding of and apply object-oriented game programming	(i) demonstrate an understanding of object-oriented game programming		

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TEKS (Knowledge and Skills)	**Student Expectation**	**Breakout**	**Element**	**Subelement**
(6) Technology operations and concepts: The student understands technology concepts, systems, and operations as they apply to game programming. The student is expected to	(E) demonstrate an understanding of and apply object-oriented game programming	(ii) apply object-oriented game programming		
(6) Technology operations and concepts: The student understands technology concepts, systems, and operations as they apply to game programming. The student is expected to	(F) demonstrate an understanding of game programming essentials, including event-driven programming, communicating with messages, and device management	(i) demonstrate an understanding of game programming essentials, including event-driven programming		
(6) Technology operations and concepts: The student understands technology concepts, systems, and operations as they apply to game programming. The student is expected to	(F) demonstrate an understanding of game programming essentials, including event-driven programming, communicating with messages, and device management	(ii) demonstrate an understanding of game programming essentials, including communicating with messages		
(6) Technology operations and concepts: The student understands technology concepts, systems, and operations as they apply to game programming. The student is expected to	(F) demonstrate an understanding of game programming essentials, including event-driven programming, communicating with messages, and device management	(iii) demonstrate an understanding of game programming essentials, including device management		
(6) Technology operations and concepts: The student understands technology concepts, systems, and operations as they apply to game programming. The student is expected to	(G) demonstrate an understanding of the role of game events, the animation loop, and game timing	(i) demonstrate an understanding of the role of game events		

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TEKS (Knowledge and Skills)	**Student Expectation**	**Breakout**	**Element**	**Subelement**
(6) Technology operations and concepts: The student understands technology concepts, systems, and operations as they apply to game programming. The student is expected to	(G) demonstrate an understanding of the role of game events, the animation loop, and game timing	(ii) demonstrate an understanding of the role of the animation loop		
(6) Technology operations and concepts: The student understands technology concepts, systems, and operations as they apply to game programming. The student is expected to	(G) demonstrate an understanding of the role of game events, the animation loop, and game timing	(iii) demonstrate an understanding of the role of game timing		
(6) Technology operations and concepts: The student understands technology concepts, systems, and operations as they apply to game programming. The student is expected to	(H) demonstrate an understanding of the role of game engines			
(6) Technology operations and concepts: The student understands technology concepts, systems, and operations as they apply to game programming. The student is expected to	(I) demonstrate an understanding of video display flicker and double buffering;	(i) demonstrate an understanding of video display flicker		
(6) Technology operations and concepts: The student understands technology concepts, systems, and operations as they apply to game programming. The student is expected to	(I) demonstrate an understanding of video display flicker and double buffering;	(ii) demonstrate an understanding of double buffering		

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TEKS (Knowledge and Skills)	**Student Expectation**	**Breakout**	**Element**	**Subelement**
(6) Technology operations and concepts: The student understands technology concepts, systems, and operations as they apply to game programming. The student is expected to	(J) apply basic game screen design and layout, including visual controls, user interfaces, menus and options	(i) apply basic game screen design, including visual controls		
(6) Technology operations and concepts: The student understands technology concepts, systems, and operations as they apply to game programming. The student is expected to	(J) apply basic game screen design and layout, including visual controls, user interfaces, menus and options	(ii) apply basic game screen design, including user interfaces		
(6) Technology operations and concepts: The student understands technology concepts, systems, and operations as they apply to game programming. The student is expected to	(J) apply basic game screen design and layout, including visual controls, user interfaces, menus and options	(iii) apply basic game screen design, including menus		
(6) Technology operations and concepts: The student understands technology concepts, systems, and operations as they apply to game programming. The student is expected to	(J) apply basic game screen design and layout, including visual controls, user interfaces, menus and options	(iv) apply basic game screen design, including options		
(6) Technology operations and concepts: The student understands technology concepts, systems, and operations as they apply to game programming. The student is expected to	(J) apply basic game screen design and layout, including visual controls, user interfaces, menus and options	(v) apply basic game screen layout, including visual controls		

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TEKS (Knowledge and Skills)	**Student Expectation**	**Breakout**	**Element**	**Subelement**
(6) Technology operations and concepts: The student understands technology concepts, systems, and operations as they apply to game programming. The student is expected to	(J) apply basic game screen design and layout, including visual controls, user interfaces, menus and options	(vi) apply basic game screen layout, including user interfaces		
(6) Technology operations and concepts: The student understands technology concepts, systems, and operations as they apply to game programming. The student is expected to	(J) apply basic game screen design and layout, including visual controls, user interfaces, menus and options	(vii) apply basic game screen layout, including menus		
(6) Technology operations and concepts: The student understands technology concepts, systems, and operations as they apply to game programming. The student is expected to	(J) apply basic game screen design and layout, including visual controls, user interfaces, menus and options	(viii) apply basic game screen layout, including options		
(6) Technology operations and concepts: The student understands technology concepts, systems, and operations as they apply to game programming. The student is expected to	(K) use game control design to understand, access, and control input devices, including keyboard, mouse, and joystick	(i) use game control design to understand input devices, including keyboard		
(6) Technology operations and concepts: The student understands technology concepts, systems, and operations as they apply to game programming. The student is expected to	(K) use game control design to understand, access, and control input devices, including keyboard, mouse, and joystick	(ii) use game control design to understand input devices, including mouse		

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TEKS (Knowledge and Skills)	**Student Expectation**	**Breakout**	**Element**	**Subelement**
(6) Technology operations and concepts: The student understands technology concepts, systems, and operations as they apply to game programming. The student is expected to	(K) use game control design to understand, access, and control input devices, including keyboard, mouse, and joystick	(iii) use game control design to understand input devices, including joystick		
(6) Technology operations and concepts: The student understands technology concepts, systems, and operations as they apply to game programming. The student is expected to	(K) use game control design to understand, access, and control input devices, including keyboard, mouse, and joystick	(iv) use game control design to access input devices, including keyboard		
(6) Technology operations and concepts: The student understands technology concepts, systems, and operations as they apply to game programming. The student is expected to	(K) use game control design to understand, access, and control input devices, including keyboard, mouse, and joystick	(v) use game control design to access input devices, including mouse		
(6) Technology operations and concepts: The student understands technology concepts, systems, and operations as they apply to game programming. The student is expected to	(K) use game control design to understand, access, and control input devices, including keyboard, mouse, and joystick	(vi) use game control design to access input device, joystick		
(6) Technology operations and concepts: The student understands technology concepts, systems, and operations as they apply to game programming. The student is expected to	(K) use game control design to understand, access, and control input devices, including keyboard, mouse, and joystick	(vii) use game control design to control input devices, including keyboard		

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TEKS (Knowledge and Skills)	**Student Expectation**	**Breakout**	**Element**	**Subelement**
(6) Technology operations and concepts: The student understands technology concepts, systems, and operations as they apply to game programming. The student is expected to	(K) use game control design to understand, access, and control input devices, including keyboard, mouse, and joystick	(viii) use game control design to control input devices, including mouse		
(6) Technology operations and concepts: The student understands technology concepts, systems, and operations as they apply to game programming. The student is expected to	(K) use game control design to understand, access, and control input devices, including keyboard, mouse, and joystick	(ix) use game control design to control input devices, including joystick		
(6) Technology operations and concepts: The student understands technology concepts, systems, and operations as they apply to game programming. The student is expected to	(L) demonstrate an understanding of and apply game animation, including the principles of animation and frame-based animation	(i) demonstrate an understanding of game animation, including the principles of animation		
(6) Technology operations and concepts: The student understands technology concepts, systems, and operations as they apply to game programming. The student is expected to	(L) demonstrate an understanding of and apply game animation, including the principles of animation and frame-based animation	(ii) demonstrate an understanding of game animation, including frame-based animation		
(6) Technology operations and concepts: The student understands technology concepts, systems, and operations as they apply to game programming. The student is expected to	(L) demonstrate an understanding of and apply game animation, including the principles of animation and frame-based animation	(iii) apply game animation, including the principles of animation		

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TEKS (Knowledge and Skills)	**Student Expectation**	**Breakout**	**Element**	**Subelement**
(6) Technology operations and concepts: The student understands technology concepts, systems, and operations as they apply to game programming. The student is expected to	(L) demonstrate an understanding of and apply game animation, including the principles of animation and frame-based animation	(iv) apply game animation, including frame-based animation		
(6) Technology operations and concepts: The student understands technology concepts, systems, and operations as they apply to game programming. The student is expected to	(M) demonstrate an understanding of decision making and types of decisions	(i) demonstrate an understanding of decision making		
(6) Technology operations and concepts: The student understands technology concepts, systems, and operations as they apply to game programming. The student is expected to	(M) demonstrate an understanding of decision making and types of decisions	(ii) demonstrate an understanding of types of decisions		
(6) Technology operations and concepts: The student understands technology concepts, systems, and operations as they apply to game programming. The student is expected to	(N) demonstrate an understanding of game events, including listeners, triggers, and timed events	(i) demonstrate an understanding of game events, including listeners		
(6) Technology operations and concepts: The student understands technology concepts, systems, and operations as they apply to game programming. The student is expected to	(N) demonstrate an understanding of game events, including listeners, triggers, and timed events	(ii) demonstrate an understanding of game events, including triggers		

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TEKS (Knowledge and Skills)	**Student Expectation**	**Breakout**	**Element**	**Subelement**
(6) Technology operations and concepts: The student understands technology concepts, systems, and operations as they apply to game programming. The student is expected to	(N) demonstrate an understanding of game events, including listeners, triggers, and timed events	(iii) demonstrate an understanding of game events, including timed events		
(6) Technology operations and concepts: The student understands technology concepts, systems, and operations as they apply to game programming. The student is expected to	(O) demonstrate an understanding of and implement collision detection, including bounding boxes and sprite collisions	(i) demonstrate an understanding of collision detection, including bounding boxes		
(6) Technology operations and concepts: The student understands technology concepts, systems, and operations as they apply to game programming. The student is expected to	(O) demonstrate an understanding of and implement collision detection, including bounding boxes and sprite collisions	(ii) demonstrate an understanding of collision detection, including sprite collisions		
(6) Technology operations and concepts: The student understands technology concepts, systems, and operations as they apply to game programming. The student is expected to	(O) demonstrate an understanding of and implement collision detection, including bounding boxes and sprite collisions	(iii) implement collision detection, including bounding boxes		
(6) Technology operations and concepts: The student understands technology concepts, systems, and operations as they apply to game programming. The student is expected to	(O) demonstrate an understanding of and implement collision detection, including bounding boxes and sprite collisions	(iv) implement collision detection, including sprite collisions		

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TEKS (Knowledge and Skills)	**Student Expectation**	**Breakout**	**Element**	**Subelement**
(6) Technology operations and concepts: The student understands technology concepts, systems, and operations as they apply to game programming. The student is expected to	(P) implement a tile-based game, including loading tile maps, drawing tile maps, rendering a tile map, and layering sprites	(i) implement a tile-based game, including loading tile maps		
(6) Technology operations and concepts: The student understands technology concepts, systems, and operations as they apply to game programming. The student is expected to	(P) implement a tile-based game, including loading tile maps, drawing tile maps, rendering a tile map, and layering sprites	(ii) implement a tile-based game, including drawing tile maps		
(6) Technology operations and concepts: The student understands technology concepts, systems, and operations as they apply to game programming. The student is expected to	(P) implement a tile-based game, including loading tile maps, drawing tile maps, rendering a tile map, and layering sprites	(iii) implement a tile-based game, including rendering a tile map		
(6) Technology operations and concepts: The student understands technology concepts, systems, and operations as they apply to game programming. The student is expected to	(P) implement a tile-based game, including loading tile maps, drawing tile maps, rendering a tile map, and layering sprites	(iv) implement a tile-based game, including layering sprites		
(6) Technology operations and concepts: The student understands technology concepts, systems, and operations as they apply to game programming. The student is expected to	(Q) demonstrate an understanding of artificial intelligence and develop and implement artificial intelligence	(i) demonstrate an understanding of artificial intelligence		

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TEKS (Knowledge and Skills)	**Student Expectation**	**Breakout**	**Element**	**Subelement**
(6) Technology operations and concepts: The student understands technology concepts, systems, and operations as they apply to game programming. The student is expected to	(Q) demonstrate an understanding of artificial intelligence and develop and implement artificial intelligence	(ii) develop artificial intelligence		
(6) Technology operations and concepts: The student understands technology concepts, systems, and operations as they apply to game programming. The student is expected to	(Q) demonstrate an understanding of artificial intelligence and develop and implement artificial intelligence	(iii) implement artificial intelligence		
(6) Technology operations and concepts: The student understands technology concepts, systems, and operations as they apply to game programming. The student is expected to	(R) demonstrate an understanding of game balance and tuning	(i) demonstrate an understanding of game balance		
(6) Technology operations and concepts: The student understands technology concepts, systems, and operations as they apply to game programming. The student is expected to	(R) demonstrate an understanding of game balance and tuning	(ii) demonstrate an understanding of game tuning		
(6) Technology operations and concepts: The student understands technology concepts, systems, and operations as they apply to game programming. The student is expected to	(S) demonstrate an understanding of player progression, including leveling, linear progression, and maintaining high score data	(i) demonstrate an understanding of player progression, including leveling		

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TEKS (Knowledge and Skills)	**Student Expectation**	**Breakout**	**Element**	**Subelement**
(6) Technology operations and concepts: The student understands technology concepts, systems, and operations as they apply to game programming. The student is expected to	(S) demonstrate an understanding of player progression, including leveling, linear progression, and maintaining high score data	(ii) demonstrate an understanding of player progression, including linear progression		
(6) Technology operations and concepts: The student understands technology concepts, systems, and operations as they apply to game programming. The student is expected to	(S) demonstrate an understanding of player progression, including leveling, linear progression, and maintaining high score data	(iii) understand player progression, including maintaining high score data		