

Department of College and Career Readiness

Game Development I Curriculum

5.0 Credits



Unit Three

Game Development I

Course Description

This course provides an introduction to 2D video game history, design, theory, development, and programming. Emphasis is placed on understanding the history of video games and analyzing industry roles, 2D game genres, 2D gameplay, 2D art design, playability, storytelling, rule dynamics and what makes a quality game. In this course, students will be responsible for every aspect of creating a 2D game. This will entail preplanning, 2D art creation, 2D animation creation, programming, creating music and sound effects, creating rules and balance for the game, and testing the game for bugs and playability.

Game Development I

Pacing Guide

Unit	Topic	Suggested Timing
Unit 1	Video Game History & Theory, and Understanding and Creating 2D Graphics	approx. 7 weeks
Unit 2	2D Game Graphics	approx. 9 weeks
Unit 3	Concept and Preproduction Stages of Creating a 2D Game	approx. 10 weeks
Unit 4	Production, Postproduction, and Distribution Stages of Creating a 2D Game	approx. 10 weeks

Educational Technology Standards

8.1.12.A.2, 8.1.12.A.3, 8.1.12.B.2, 8.1.12.D.1, 8.1.12.F.1

➤ Technology Operations and Concepts

- Collaborate in online courses, learning communities, social networks or virtual worlds to discuss a resolution to a problem or issue.
Example from unit: students will use the game salad online community to work with other game designers from around the world.
- Produce and edit a multi-page digital document for a commercial or professional audience and present it to peers and/or professionals in that related area for review.
Example from unit: In this unit students will work from and edit a professional game design document.

➤ Creativity and Innovation

- Apply previous content knowledge by creating and piloting a digital learning game or tutorial.
Example from unit: as students move on to the production stage of video game creation they will be using many tutorials from online to help in the completion of their game.

➤ Digital Citizenship

- Demonstrate appropriate application of copyright, fair use and/or Creative Commons to an original work.
Example from unit: students are allowed to use graphics and audio from free online sources but must follow all copy write laws.

➤ Critical Thinking, Problem Solving, Decision Making

- Evaluate the strengths and limitations of emerging technologies and their impact on educational, career, personal and or social needs.
Example from unit: Students must be aware of the limitations of technology to make sure their game runs smoothly on any system.

Career Ready Practices

Career Ready Practices describe the career-ready skills that all educators in all content areas should seek to develop in their students. They are practices that have been linked to increase college, career, and life success. Career Ready Practices should be taught and reinforced in all career exploration and preparation programs with increasingly higher levels of complexity and expectation as a student advances through a program of study.

CRP1. Act as a responsible and contributing citizen and employee

Career-ready individuals understand the obligations and responsibilities of being a member of a community, and they demonstrate this understanding every day through their interactions with others. They are conscientious of the impacts of their decisions on others and the environment around them. They think about the near-term and long-term consequences of their actions and seek to act in ways that contribute to the betterment of their teams, families, community and workplace. They are reliable and consistent in going beyond the minimum expectation and in participating in activities that serve the greater good.

Example from unit: In this unit students will be assuming many job roles and responsibilities as they work on their game.

CRP2. Apply appropriate academic and technical skills.

Career-ready individuals readily access and use the knowledge and skills acquired through experience and education to be more productive. They make connections between abstract concepts with real-world applications, and they make correct insights about when it is appropriate to apply the use of an academic skill in a workplace situation.

Example from unit: Game creation requires both technical and academic skills as they will be taking an abstract idea from their imagination and making it a real word application.

CRP4. Communicate clearly and effectively and with reason.

Career-ready individuals communicate thoughts, ideas, and action plans with clarity, whether using written, verbal, and/or visual methods. They communicate in the workplace with clarity and purpose to make maximum use of their own and others' time. They are excellent writers; they master conventions, word choice, and organization, and use effective tone and presentation skills to articulate ideas. They are skilled at interacting with others; they are active listeners and speak clearly and with purpose. Career-ready individuals think about the audience for their communication and prepare accordingly to ensure the desired outcome.

Example from unit: Students will run in to many problems during game creation and will need to communicate the problems with the teacher and online forums as they search for solutions.

Career Ready Practices

CRP6. Demonstrate creativity and innovation.

Career-ready individuals regularly think of ideas that solve problems in new and different ways, and they contribute those ideas in a useful and productive manner to improve their organization. They can consider unconventional ideas and suggestions as solutions to issues, tasks or problems, and they discern which ideas and suggestions will add greatest value. They seek new methods, practices, and ideas from a variety of sources and seek to apply those ideas to their own workplace. They take action on their ideas and understand how to bring innovation to an organization.

Example from unit: Students will spend most of this unit finding creative and original ways to solve problems with their game's functionality.

CRP7. Employ valid and reliable research strategies.

Career-ready individuals are discerning in accepting and using new information to make decisions, change practices or inform strategies. They use reliable research process to search for new information. They evaluate the validity of sources when considering the use and adoption of external information or practices in their workplace situation.

Example from unit: Students will need to search online forums, sites, and learning communities for help and content for their games.

CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.

Career-ready individuals readily recognize problems in the workplace, understand the nature of the problem, and devise effective plans to solve the problem. They are aware of problems when they occur and take action quickly to address the problem; they thoughtfully investigate the root cause of the problem prior to introducing solutions. They carefully consider the options to solve the problem. Once a solution is agreed upon, they follow through to ensure the problem is solved, whether through their own actions or the actions of others.

Example from unit: Students will need to fix bugs and glitches in their video game.

Career Ready Practices

CRP11. Use technology to enhance productivity.

Career-ready individuals find and maximize the productive value of existing and new technology to accomplish workplace tasks and solve workplace problems. They are flexible and adaptive in acquiring new technology. They are proficient with ubiquitous technology applications. They understand the inherent risks-personal and organizational-of technology applications, and they take actions to prevent or mitigate these risks.

Example from unit: Students will use computers and block coding to make a video game.

Differentiated Instruction

Strategies to Accommodate Students Based on Individual Needs

<u>Time/General</u>	<u>Processing</u>	<u>Comprehension</u>	<u>Recall</u>
<ul style="list-style-type: none"> • Extra time for assigned tasks • Adjust length of assignment • Timeline with due dates for reports and projects • Communication system between home and school • Provide lecture notes/assignments, and tutorials outline 	<ul style="list-style-type: none"> • Extra Response time • Have students verbalize steps • Repeat, clarify or reword directions • Mini-breaks between tasks • Provide a warning for transitions • Video lessons online 	<ul style="list-style-type: none"> • Precise step-by-step directions • Short manageable tasks • Brief and concrete directions • Provide immediate feedback • Small group instruction • Emphasize multi-sensory learning 	<ul style="list-style-type: none"> • Teacher-made checklist • Use visual graphic organizers • Reference resources to promote independence • Visual and verbal reminders • Graphic organizers
<u>Assistive Technology</u>	<u>Tests/Quizzes/Grading</u>	<u>Behavior/Attention</u>	<u>Organization</u>
<ul style="list-style-type: none"> • Computer/whiteboard • Video lesson • Spell-checker • Text speech software 	<ul style="list-style-type: none"> • Adjusted rubrics for projects • Study guides • Shortened tests • Read directions aloud 	<ul style="list-style-type: none"> • Consistent daily structured routine • Simple and clear classroom rules • Frequent feedback 	<ul style="list-style-type: none"> • Individual daily planner • Display a written agenda • Note-taking assistance • Color code materials

Differentiated Instruction

Strategies to Accommodate Students Based on Content-Specific Needs

- Extra time for assigned tasks
- Adjust length of assignment
- Timeline with due dates for reports and projects
- Communication system between home and school
- Small group instruction

Enrichment

Strategies Used to Accommodate Based on Students Individual Needs:

- Adaption of Material and Requirements
- Evaluate Vocabulary
- Elevated Text Complexity
- Elevated Projects Rubrics
- Independent Written and Video Online Tutorials
- Projects completed individual or with Partners
- Self Selection of Research
- Tiered/Multilevel Activities
- Online Learning Communities
- Individual Response Board
- Independent Book Studies
- Open-ended activities
- Community/Subject expert mentorships

Assessments

Suggested Formative/Summative Classroom Assessments

- Storyboards
- Teacher-created Unit Assessments, Topic Assessments, Quizzes
- Teacher-created DBQs, Essays, Short Answer
- Accountable Talk, Debate, Oral Report, Role Playing, Think Pair, and Share
- Projects, Portfolio, Presentations, Prezi, Gallery Walks
- Homework
- Concept Mapping
- Primary and Secondary Source analysis
- Photo, Video, Political Cartoon, Radio, Game Analysis
- Create an Original Song, Animation, Board Game
- Game salad Video Tutorials
- Khan Academy intro to coding.

Interdisciplinary Connections

English Language Arts

- Write a story for a 2D game. (NJSLSA.W3)
- Complete a game design document. (NJSLSA.W2)

Social Studies

- Research the history of 2D animation. (6.1.12)
- Research the evolution of the 2D animation industry. (6.1.12)

World Language

- Translate animation industry-content (7.1.ILA)
- Create a translated index of animation industry vocabulary (7.1.ILA)

Math

- Use geometry to animated objects (G-CO)
- Assign variables and values for the variables to time an animation (A-REI)

Fine & Performing Arts

- Create animations for use in game. (1.2.12)
- Design 2D images that appear 3D. (1.2.12)

Science

- Research latest developments in 2D animation technology (HS-ETS1-4)
- Use physics to create believable movements in game (HS-PS3)

New Jersey Student Learning Standards

8.2 Technology

TECHNOLOGY AND SOCIETY

- 8.2.12.B.1 Research and analyze the impact of the design constraints (specifications and limits) for a product or technology driven by a cultural, social, economic or political need and publish for review.

COMPUTATIONAL THINKING: PROGRAMMING:

- 8.2.12.E.3 Use a programming language to solve problems or accomplish a task (e.g., robotic functions, website designs, applications, and games).
- 8.2.12.E.4 Use appropriate terms in conversation (e.g., troubleshooting, peripherals, diagnostic software, GUI, abstraction, variables, data types and conditional statements)

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9.1 Personal Financial Literacy

- 9.1.12.E.4: Evaluate how media, bias, purpose, and validity affect the prioritization of consumer decisions and spending.

9.3– Career and Technical Education

CAREER CLUSTER: ARTS, A/V TECHNOLOGY & COMMUNICATIONS (AR)

- 9.3.12.AR.1: Analyze the interdependence of the technical and artistic elements of various careers within the Arts, A/V Technology & Communications Career Cluster.
- 9.3.12.AR.3: Analyze the lifestyle implications and physical demands required in the arts, audio/visual technology and communications workplace.

- 9.3.12.AR.4: Analyze the legal and ethical responsibilities required in the arts, audio/visual technology and communications workplace.
- 9.3.12.AR.6: Evaluate technological advancements and tools that are essential to occupations within the Arts, A/V Technology & Communications Career Cluster.

PATHWAY: VISUAL ARTS (AR-VIS)

- 9.3.12.AR-VIS.2 Analyze how the application of visual arts elements and principles of design communicate and express ideas.
- 9.3.12.AR-VIS.3: Analyze and create two and three-dimensional visual art forms using various media.

INFORMATION TECHNOLOGY CAREER CLUSTER

- 9.3.IT.2: Use product or service design processes and guidelines to produce a quality information technology (IT) product or service.
- 9.3.IT.3: Demonstrate the use of cross-functional teams in achieving IT project goals.
- 9.3.IT.6: Describe trends in emerging and evolving computer technologies and their influence on IT practices.

PATHWAY: PROGRAMMING & SOFTWARE DEVELOPMENT (IT-PRG)

- 9.3.IT-PRG.4: Demonstrate the effective use of software development tools to develop software applications.
- 9.3.IT-PRG.5: Apply an appropriate software development process to design a software application.
- 9.3.IT-PRG.6: Program a computer application using the appropriate programming language.
- 9.3.IT-PRG.7: Demonstrate software-testing procedures to ensure quality products.

PATHWAY: INFORMATION SUPPORT & SERVICES (IT-SUP)

- 9.3.IT-SUP.2: Manage operating systems and software applications, including maintenance of upgrades, patches and service packs.
- 9.3.IT-SUP.3: Apply appropriate troubleshooting techniques in resolving computer hardware, software and configuration problems.

CAREER CLUSTER: SCIENCE, TECHNOLOGY, ENGINEERING & MATHEMATICS (ST)

- 9.3.ST.6: Demonstrate technical skills needed in a chosen STEM field.

PATHWAY: ENGINEERING & TECHNOLOGY CAREER PATHWAY (ST-ET)

- 9.3.ST-ET.3: Apply processes and concepts for the use of technological tools in STEM.
- 9.3.ST-ET.4: Apply the elements of the design process.

Common Career Technical Core (CCTC)

Arts, A/V Technology & Communications Career Cluster (AR)

AR 1– Analyze the interdependence of the technical and artistic elements of various careers within the Arts, A/V Technology & Communications Career Cluster.

- AR 1.1 Summarize the features of the partnership that technology and the arts have in developing presentations and productions.
- AR 01.4 – State how various Career Pathways within the cluster work together to generate productions, media and other activities.

AR 03 – Analyze the lifestyle implications and physical demands required in the arts, audio/visual technology and communications workplace.

- AR 03.3 – 3. Analyze ethical conduct that provides proper credit to those whose ideas and content have been used.

AR 06 - Evaluate technological advancements and tools that are essential to occupations within the Arts, A/V Technology & Communications Career Cluster.

- AR 06.1 – Research the impact of potential new technological advancements related to this cluster in the future.
- AR 06.2 – Analyze the technological systems that are apparent within the various pathways in this cluster.

AR AV 4 - Design an audio, video and/or film production.

- AR AV4.2. Identify the basic functions and resources for editing an audio/video production.

AR VIS 1 - Analyze how the application of visual arts elements and principles of design communicate and express ideas.

- AR VIS 01.5 – Analyze the development of tools and technologies employed in the visual arts.

AR VIS 3 - Analyze and create two- and three-dimensional art forms using various media.

- AR VIS 03.1 – Analyze art elements and principles of two-dimensional works of visual art in various media, including drawing, printmaking and computer software.
- AR VIS 03.3 – Analyze multimedia applications of software/hardware for the purposes of visual communications.
- AR VIS 03.5. -- Apply art elements and principles to virtual and interactive platforms.

Information Technology Career Cluster (IT)

IT 02 - Use product or service design processes and guidelines to produce a quality information technology (IT) product or service.

- IT 1.1 Summarize the process of IT product/service design.
- IT 1.2 Identify and implement new products/services.

IT 06 - Describe trends in emerging and evolving computer technologies and their influence on IT practices.

- IT 06. - 1. Identify new IT technologies.

IT 07 - Perform standard computer backup and restore procedures to protect IT information.

- IT 07.1 – Explain the need for regular backup procedures.
- IT 07.2 – Configure, perform and maintain backup procedures.

IT PRG 02 - Demonstrate the use of industry standard strategies and project planning to meet customer specifications.

- IT PRG 02.3 Design project plan.

IT PRG 04 - Demonstrate the effective use of software development tools to develop software applications.

- IT PRG 04.1. Employ tools in developing software applications.

- IT PRG 04.2. Demonstrate use of computer-aided software engineering (CASE) tools.
- IT PRG 04.3. Apply language-specific programming tools/techniques.

IT PRG 05 - Apply an appropriate software development process to design a software application.

- IT PRG 05.1 Describe software development processes and methodology.

IT PRG 06 – Program a computer application using the appropriate programming language.

- IT PRG 06.1. Summarize program development methodology.
- IT PRG 06.3. Demonstrate proficiency in developing an application using an appropriate programming language.
- IT PRG 06.4. Explain basic software systems implementation.
- IT PRG 06. Resolve problems with integration.

IT WD 04 - Demonstrate the effective use of tools for digital communication production, development and project management.

- IT WD 04.1 - Select and use appropriate software tools.

IT WD 06 - Design, create and publish a digital communication product based on customer needs.

- IT WD 06.1. Produce a digital communication product as member of a development team.
- IT WD 06.2. List and employ functional design terms and criteria.
- IT WD 06.3. Create product visual design.
- IT WD 06.4. Acquire and produce content for a digital communication product.
- IT WD 06.7. Employ basic motion graphic programming knowledge.

Common Core State Standards (CCSS)

CCSS - English-Language Arts

Craft and Structure:

- CCSS.ELA-LITERACY.RI.12.4 Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings.

Research to Build and Present Knowledge:

- CCSS.ELA-LITERACY.W.12.9b. Draw evidence from informational texts to support analysis, reflection, and research; apply *grade 12 Reading standards* to literary nonfiction

CCSS - Mathematics

Extending to Three Dimensions:

- CCSS.MATH.CONTENT.HSS.G.GMD.4 Identify the shape of a two-dimensional cross-section of a three-dimensional figure and identify three-dimensional objects created by the rotation of two-dimensional objects.
- CCSS.MATH.CONTENT.HSS.G.MG.1 Use geometric shapes, their measures, and their properties to describe objects
- CCSS.MATH.CONTENT.HSS.G.MG.14 Solve design problems using geometric methods.

Congruence, Proof, and Construction:

- CCSS.MATH.CONTENT.HSS.G.CO.2, G.CO.3, G.CO.4, G.CO.5 Develop and perform rigid transformations that include reflections, rotations, translations and dilations using geometric software, graph paper, tracing paper, and geometric tools and compare them to non-rigid transformations.

<p>Course: Game Development I</p> <p>Unit: 3 – 2D Game Concept and Preproduction Stage.</p> <p>Grade Level: 9-12</p>	<p>Unit Overview:</p> <p>Students will understand the concept and preproduction stages of creating a 2D game and be responsible achieving completion of those stages for their own 2D game.</p>
<p>New Jersey Student Learning Standards (NJSLS): 8.2.12B.1, 8.2.12.E.3, 8.2.12.E.4, 9.1.12E.4, 9.3.12.AR.1, 9.3.12.AR.3, 9.3.12.AR.4, 9.3.12.ARR.6, 9.3.12.AR.AV4.2, 9.3.12.AR.VIS.2, 9.3.12.AR.VIS.3, 9.3.IT.2, 9.3.IT.3, 9.3.IT.6, 9.3.IT.PRG.4, 9.3.IT.PRG.5, 9.3.IT.PRG.5, 9.3.IT.PRG.6, 9.3.IT.PRG.7, 9.3.IT.PRG.10, 9.3.IT.SUP.2, 9.3.IT.SUP.3, 9.3.ST.6, 9.3.ST.ET.3, 9.3.ST.ET.4</p>	
<p>Common Career Technical Core (CCTC): AR 1.1, AR 01.4, AR 03.3-3, AR 06.1, AR 06.2, AR VIS 01.5, AR VIS 03.1, AR VIS 03.3, AR VIS 03.5, IT 1.1, IT 1.2, IT 06.1, IT 07.1, IT 07.2, IT PRG 02.3, IT PRG 04.1, IT PRG 04.2, IT PRG 04.3, IT PRG 05.1, IT PRG 06.1, IT PRG 06.3, IT PRG 06.4, IT PRG 06, IT WD 04.1, IT WD 06.1, IT WD 06.2, IT WD 06.3, IT WD 06.4, IT WD 06.7</p>	
<p>Common Core State Standards (CCSS): CCSS.ELA-LITERACY.RI.12.4, CCEE.ELA-LITERACY.W.12.9b, CSS.MATH.CONTENT.HSS.G.GMD.4, CSS.MATH.CONTENT.HSS.G.MG.1, CSS.MATH.CONTENT.HSS.G.MG.14, CCSS.MATH.CONTENT.HSS.G.CO.2, GO.3, G.CO.4, G.CO.5</p>	

Student Learning Objectives (SLOs)	Essential Questions	Skills & Indicators	Sample Activities	Resources
<p>Dissect, critique, and replicate all the elements of a 2D game.</p> <p>NJSLS: 8.2.12B.1, 8.2.12.E.4, 9.1.12E.4, 9.3.12.AR.1, 9.3.12.AR.3, 9.3.12.ARR.6,</p>	<p>Why is it important to consider what platform the player will be playing on?</p> <p>Do makes a quality game?</p> <p>What elements might</p>	<ul style="list-style-type: none"> ▪ Identify and describe 2D video game genres. ▪ Describe what it means to have a balanced game. ▪ Compare and contrast the different platforms available 	<p>Teachers for a Day</p> <p>Student pairs are assigned a genre of game. Students will do research on the genre (where it started, its popularity, its target audience, popular games etc.). Then turn key the</p>	<p>Writing Your First Freelance Video Game Review</p> <p>http://www.freelancewriting.com/articles/FF-writing-a-video-game-review.php</p>

Student Learning Objectives (SLOs)	Essential Questions	Skills & Indicators	Sample Activities	Resources
<p>9.3.12.AR.AV4.2, 9.3.12.AR.VIS.2,</p> <p>CCTC: AR 01.4, AR 03.3-3, AR 06.1, AR 06.2</p> <p>CCSS: CCSS.ELA-LITERACY.RI.12.4, CCEE.ELA-LITERACY.W.12.9b</p>	<p>affect a player’s emotional reaction to a game?</p> <p>How does having a balanced game affect the player?</p> <p>Does a game’s genre affect a games objective/reward system?</p>	<p>for 2D games.</p> <ul style="list-style-type: none"> ▪ Explain the reasons for and importance of creating a rewards system. ▪ Critically analyze a game for playability. ▪ Break down a 2D game into its core elements. ▪ Identify different ways to let the player know their objective in a game. ▪ Identify ways a game teaches a player how to play. 	<p>information to the rest of the classroom.</p> <p>Game Review Students read game reviews written by professional and discuss the style of writing and content. Students then write a review of their own on a game of their choice.</p> <p>Card Sort Student pairs sort cards with characteristics of 2D gaming platforms in to the correct platform.</p>	<p>Know Your Retro Gaming Genres http://classicgames.about.com/od/glossary/p/Get-To-Know-Your-Retro-Gaming-Genres-Platformers.htm</p> <p>Understanding Balance in Video Games http://www.gamasutra.com/view/feature/134768/understanding_balance_in_video_.php?print=1</p> <p>The Many Ways to Show the Player How It's Done With In-Game Tutorials http://gamedevelopment.tutsplus.com/tutorials/the-many-ways-to-show-the-player-how-its-done-with-in-game-tutorials--gamedev-400</p>
<p>Use the appropriate software development</p>	<p>Should multiple genres</p>	<ul style="list-style-type: none"> ▪ Develop a color 	<p>Think Pair Share</p>	<p>Easy Flow Chart Creator</p>

Student Learning Objectives (SLOs)	Essential Questions	Skills & Indicators	Sample Activities	Resources
<p>process for the concept stage of the creation of a 2D game.</p> <p>NJSLS: 8.2.12B.1, 8.2.12.E.4, 9.1.12E.4, 9.3.12.AR.1, 9.3.12.AR.3, 9.3.12.AR.4, 9.3.12.ARR.6, 9.3.IT.AR.VIS.2, 9.3.IT.3</p> <p>CCTC: AR 01.4, AR 03.3-3, AR 06.1, AR 06.2, IT 1.1. IT 1.2, IT.PRG.02.3, IT.PRG.05.1, IT.PRG.06.01, IT.PRG.06.03, IT.PRG.06.04</p> <p>CCSS: CCSS.ELA-LITERACY.RI.12.4, CCEE.ELA-LITERACY.W.12.9b</p>	<p>be mixed into one game?</p> <p>What are the qualities of good rules?</p>	<p>scheme for a 2D game.</p> <ul style="list-style-type: none"> ▪ Examine arts styles for 2D games. ▪ Create concept art for a 2D game. ▪ Write a rough draft for a video game script. ▪ Create beta using rough graphics to explore in game mechanics. ▪ Present game concept to the rest of the class. ▪ Collaborate with other students to refine game concept. 	<p>What happens when a game lacks balance? Have you ever played an unbalanced game? Is game balance objective or subjective?</p> <p>Flow Chart Students create a flow chart for their game. The chart should include how controls work, what happens when a player fails to achieve goals, what happens when goals are achieved etc.</p> <p>Pitch Game Idea Students will pitch their game (script, flowchart, concept graphic etc.) to the rest of the class as if they were the heads of a video game company. The rest of the class will give feed back and help the presenter polish their game concept.</p>	<p>https://www.draw.io/</p> <p>2D Video Game Concept Art https://www.pinterest.com/yuranebykov/2d-game-art/?lp=true</p> <p>2D Sprite Generator http://gaurav.munjal.us/Universal-LPC-Spritesheet-Character-Generator/?sex=male&body=dark2&eyes=yellow&nose=big&legs=pants_teal&clothes=longsleeve_white&hair=page_blue&arms=none&hat=cap_leather&shoes=boots_metal&weapon=none&shield=none</p>

Student Learning Objectives (SLOs)	Essential Questions	Skills & Indicators	Sample Activities	Resources
<p>Use the appropriate software development process to preplan for the creation of a 2D game.</p> <p>NJSLS: 8.2.12B.1, 8.2.12.E.4, 9.1.12E.4, 9.3.12.AR.1, 9.3.12.AR.3, 9.3.12.AR.4, 9.3.12.ARR.6, 9.3.IT.AR.VIS.2, 9.3.IT.3</p> <p>CCTC: AR 01.4, AR 03.3-3, AR 06.1, AR 06.2, IT 1.1. IT 1.2, IT.PRG.02.3, IT.PRG.05.1, IT.PRG.06.01, IT.PRG.06.03, IT.PRG.06.04</p> <p>CCSS: CCSS.ELA-LITERACY.RI.12.4, CCEE.ELA-LITERACY.W.12.9b</p>	<p>What are some things to look for when a player is playing your game that let you know the game is too hard, too easy, fun or boring?</p> <p>How do different combinations of level parameters give rise to different kinds of games?</p> <p>How do core mechanics create patterns of action within a game?</p>	<ul style="list-style-type: none"> ▪ Brainstorm a 2D video game with 3 levels. ▪ Create a graphic organizer. ▪ Create a story map for a 2D game. ▪ Design a visual style for a 2D video game. ▪ Design a storyboard for a 2D video game. ▪ Create a balanced set of rules for a 2D video game. ▪ Create a rewards system for a 2D game. ▪ Present 2D video game concept in mock sales pitch. 	<p>Storyboard Students create a storyboard for a 2D Video game.</p> <p>Web Graphic Organizer Students create a web graphic organizer as a way to visually represent their video game’s rules, rewards, objectives, power ups, and story progression.</p> <p>Mock Sale Pitch Once students have completed the preplanning process they will present their game idea to the class as if they are trying to gain funding for the game. The rest of the class will review the presentation and provide feed back to the presenter.</p>	<p>Creating a Roadmap: Storyboarding as an Element of Game Design https://gamestarmechanics.com/teachers/sample_lesson_hodgson</p> <p>Gamester Mechanic Learning Guide https://sites.google.com/a/elinemedia.com/gsmlearningguide/</p> <p>Create Graphic Organizer Software http://creately.com/Free-K12-Education-Templates</p>

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<p>Understand the elements of 2D animation, how they are created and how they are used in 2D games</p> <p>NJSLS: 8.2.12.E.4, 9.3.12.AR.1, 9.3.12.AR.3, 9.3.12.AR.4, 9.3.IT.6, 9.3.IT.SUP.2, 9.3.IT.SUP.3, 9.3.ST.6, 9.3.ST.ET.3, 9.3.ST.ER.4,</p> <p>CCTC: AR 1.1, AR 01.4, AR 03.3-3, AR 06.1, AR 06.2, IT 06.1, IT 07.1, IT 07.2, IT WD 04.1, IT WD 06.4 – 4, IT WD 06.2, IT WD 06.4</p> <p>CCSS: CCSS.ELA-LITERACY.RI.12.4, CCEE.ELA-</p>	<p>Is movement an illusion? How can an animator control the speed / timing of an animation? Why is it important to sketch out designs before animating?</p>	<ul style="list-style-type: none"> ▪ Create character model sheet. ▪ Understand the importance of ¾ pose. ▪ Apply principles of composition, ▪ Apply principles of perspective. ▪ Examine the major events in animation to understand how trends, technological advancements as well as stylistic and cultural developments affect the industry ▪ Solve problems involved with rotating a character in three-dimensional space ▪ Apply the correct principles to perform animation tasks such as flame and smoke, 	<p>2D Short Remake Students watch a 2D Short in class and attempt to recreate it on their own.</p> <p>Bouncing Ball Animation Students work together to analyze and create a bouncing ball loop.</p> <p>Create Character Animations Students create the walk/run/attach/jump animations for the objects/characters in their game.</p>	<p>Top 5 Free Animation Software https://www.youtube.com/watch?v=N_biEnzPIkE</p> <p>51 Great Animation Exercises to Master (Level 1) https://www.youtube.com/watch?v=mSo_7UI8nTc</p> <p>How to animate a Walk Cycle Animation Tutorial https://www.youtube.com/watch?v=ALESgmAYfNc</p>

Student Learning Objectives (SLOs)	Essential Questions	Skills & Indicators	Sample Activities	Resources
LITERACY.W.12.9b		water drop, explosion, bubbles, curtains, pixie dust, and water bucket.		
Exhibit graphic design skills to create worlds, collectables and menus for a 2D game.	<p>Why is it important to sketch out designs before animating?</p> <p>How does character's surroundings help the player understand the character's motives?</p> <p>How is a games genre reflected in its art style?</p>	<ul style="list-style-type: none"> ▪ Utilize the principles of design. ▪ Create a 2d world that gives the illusion of 3D. ▪ Create environments for the player to explore. ▪ Utilize colors to create mood and atmosphere. ▪ Create visual aids for the player. ▪ Create a visual interface for the player to navigate the game. 	<p>Commission an artist. Student pairs share their ideas for an environment in a game and have another student create it for them.</p> <p>Create the main menu screen Students use what they have learned in class to create the visuals for a main menu screen for their game.</p> <p>Trace a 3D World. Students trace a photo of a 3D world and see how a 2D rendition of that world is created using scaling and blocking.</p>	<p>2D Game Art Tutorials For Beginners - Creating A 3D Looking Ball in Inkscape https://www.youtube.com/watch?v=yrzY7Y1FrXM</p> <p>Best Way to Create A Map for a 2D Game? https://gamedev.stackexchange.com/questions/5173/best-way-to-create-a-map-for-a-2d-game</p> <p>Everything you need to start making 2D games in Unity https://unity3d.com/learn/tutorials/topics/2d-game-creation</p>

Student Learning Objectives (SLOs)	Essential Questions	Skills & Indicators	Sample Activities	Resources
<p>Exhibit graphic design skills to create characters (heroes, villains and NPCs) and create 2D animations designed to be use in their original 2D video game.</p> <p>NJSLS: 8.2.12.E.4, 9.3.12.AR.1, 9.3.12.AR.3, 9.3.12.AR.4, 9.3.12.AR.VIS.2, 9.3.12.AR.VIS.3, 9.3.IT.6, 9.3.IT.SUP.2, 9.3.IT.SUP.3, 9.3.ST.6, 9.3.ST.ET.3, 9.3.ST.ER.4</p> <p>CCTC: AR 1.1, AR 01.4, AR 03.3-3, AR 06.1, AR 06.2, IT 06.1, IT 07.1, IT 07.2, IT WD 04.1, IT WD 06.4 – 4,</p> <p>CCSS: CCSS.ELA-LITERACY.RI.12.4,</p>	<p>How do the principles of art and design fit into animation?</p> <p>How has technology changed 2D animation?</p> <p>Where can you find jobs in computer animation?</p> <p>What are the pros and cons of key-frame animation?</p>	<ul style="list-style-type: none"> ▪ Identify the basics of animation timing. ▪ Understand how to design a character for 2D video game animation. ▪ Explain the importance of walk cycles and their basic construction ▪ Create a 2D animation. ▪ Explain and utilize Key-frame animation. ▪ Explain how a 2D object can be given a sense of flexibility. ▪ Stage a 2D scene using original graphics. 	<p>Sprite Sheet Creation Students use 2D graphic software to create a spite sheet for there video game.</p> <p>Ball Key Frame Animation Students use key-frame animation software to create basic animation of a ball bouncing. Focus should be on including squish and stretch in the animation.</p> <p>Technology and Animation Guided Notes Teacher prepares handouts that outline the day’s lesson for the students but leave blank spaces. Students are to fill in the blanks during instruction.</p>	<p>Create a Sprite Sheet in Photoshop https://www.youtube.com/watch?v=cRE2G96591E</p> <p>Unity 4.3 Sprite Sheet Animation https://www.youtube.com/watch?v=zMJRs866XL0</p> <p>2D Key-Frame Animation Software http://www.pencil2d.org/</p>

Student Learning Objectives (SLOs)	Essential Questions	Skills & Indicators	Sample Activities	Resources
CCEE.ELA-LITERACY.W.12.9b, CSS.MATH.CONTENT.HSS.G.GMD.4, CSS.MATH.CONTENT.HSS.G.MG.1, CSS.MATH.CONTENT.HSS.G.MG.14, CCSS.MATH.CONTENT.HSS.G.CO.2, GO.3, G.CO.4, G.CO.5				

Unit 3 Vocabulary

2D Animation
Ambient Audio
Animator
Architectural Animation
Button
Compression
Copyright
Design Documentation
Editor
Extremes
Fade
Figures
File Extension
Frame

Frame Rate
Interactivity
Joints
Key-Frame Animation
Lines
Model Sheet
Morphing
Navigation
Object Based Animation
Peak Audio
Pixilation
Script
Segments
Squash and Stretch
Storyboard
Storyboards
Timelines
Track
Tweening

Suggested Unit Projects

Choose At Least One

Students are assign 2 emotions and are tasked to create audio and an accompanying graphic that will evoke those emotions. This multimedia project will be presented to the class. It will be the audience's job to guess the emotion.

Create a 2D Video graphics for a 2D video game that has 3 Levels. Graphics should be fully immersive and have the feeling that they are all from the same world.

Suggested Structured Learning Experiences

Museum of Play
 1 Manhattan Square
 Rochester, NY 14607
<http://www.museumofplay.org/about/icheg>

Nintendo NY
 10 Rockefeller Plaza
 New York, New York 10020
<http://nintendonyc.com/faq/>

Cooper Hewitt
 2 East 91st Street
 New York, New York 10128
<http://www.cooperhewitt.org/visit/getting-here/>