PATERSON PUBLIC SCHOOLS

Preparing All Children for College and Career

Department of College and Career Readiness

Game Development II Curriculum

5.0 Credits

Unit One

Game Development II

Course Description

This course provides an extension to the concepts covered in Game Development I, and will introduce students to 3D video game design, theory, development, and programming. Emphasis is placed on understanding and analyzing industry roles, 3D game genres, 3D game play, 3D art design, playability, storytelling, rule dynamics in a 3D world and what makes quality game. The course includes an introduction to 3D modeling, 3D Animation, coding in Python, 3D physics and creating a 3D game. Topics include geometric transformation, 3D object models, understanding what makes up a mesh, texturing, lighting, animation, creating physics, and creating interactivity in a 3D world.

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Game Development II

Pacing Guide		
Unit	**Topic**	**Suggested Timing**
Unit 1	Game Development I Review, with a Focus on 2D vs. 3D	approx. 7 weeks
Unit 2	Coding with Python	approx. 9 weeks
Unit 3	Concept and Preproduction Stages of Creating a 3D Game	approx. 10 weeks
Unit 4	Production, Postproduction, and Distribution Stages of Creating a 3D Game	approx. 10 weeks

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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 of use within unit: Use online forums and social media to analyze the social affect videogames have had on 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 of use within unit: Develop an original game design document for a 2D Game and present document to peers for review.

➤ **Creativity and Innovation**

- Apply previous content knowledge by creating and piloting a digital learning game or tutorial.

  Example of use within unit: Use online tutorials to fill out a Game Design Document for an original game.

➤ **Digital Citizenship**

- Demonstrate appropriate application of copyright, fair use and/or Creative Commons to an original work.

  Example of use within unit: Use copyright free elements from online communities as elements in a 2D game document.

➤ **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 of use within unit: Compare and contrast old game technologies and new and their impact on young minds and life styles.

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 of use within unit:** Assume the role of a game designer and adhere to copyright rules while developing an original 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 of use within unit:** Use word processing software and online search tools and software to create lesson on the history of video games.

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 of use within unit:** Assume the role of teacher and turnkey information about job roles in the video game industry to peers.

CRP5. Consider the environmental, social and economic impacts of decisions.
Career-ready individuals understand the interrelated nature of their actions and regularly make decisions that positively impact and/or mitigate negative impact on other people, organization, and the environment. They are aware of and utilize new technologies, understandings, procedures, materials, and regulations affecting the nature of their work as it relates to the impact on the social condition, the environment and the profitability of the organization.
- **Example of use within unit:** Examine the social and economic impact of video games on America.

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 of use within unit:** Develop the original mechanics, physics and user interface for an original 3D game.

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 of use within unit**: Research the evolution of video games socially, technically, and economical.

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

Career Ready Practices

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 of use within unit:** Student groups will share projects digitally and flow chart software to organize user interface and game flow.

CRP12. Work productively in teams while using cultural global competence.
Career-ready individuals positively contribute to every team, whether formal or informal. They apply an awareness of cultural difference to avoid barriers to productive and positive interaction. They find ways to increase the engagement and contribution of all team members. They plan and facilitate effective team meetings.

- **Example of use within unit:** Student teams work together to create a lesson in video game history to present to the class as the play teacher for a day.

Differentiated Instruction

Strategies to Accommodate Students Based on Individual Needs

Time/General	Processing	Comprehension	Recall
• 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	• Extra Response time • Have students verbalize steps • Repeat, clarify or reword directions • Mini-breaks between tasks • Provide a warning for transitions • Video lessons online	• Precise step-by-step directions • Short manageable tasks • Brief and concrete directions • Provide immediate feedback • Small group instruction • Emphasize multi-sensory learning	• Teacher-made checklist • Use visual graphic organizers • Reference resources to promote independence • Visual and verbal reminders • Graphic organizers
Assistive Technology	**Tests/Quizzes/Grading**	**Behavior/Attention**	**Organization**
• Computer/whiteboard • Video lesson • Spell-checker • Text speech software	• Adjusted rubrics for projects • Study guides • Shortened tests • Read directions aloud	• Consistent daily structured routine • Simple and clear classroom rules • Frequent feedback	• 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

- Assistive Technology

- Translation Software

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

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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

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Interdisciplinary Connections

English Language Arts
- Close reading of professional video game related content. (NJSLSA.R1)
- Write professional level game review. (NJSLSA.W2)

Social Studies
- Research the history of a video game industry. (6.1.12)
- Research the social impact and economic impact of the video game industry. (6.3.12)

World Language
- Translate video game industry-content (7.1.ILA)
- Create a translated index of video game industry vocabulary (7.1.ILA)

Math
- Calculate how a game makes money within the commercial industry. (N.Q.A.1)
- Use proportions to understand graphic scaling. (N.Q.A.2)

Fine & Performing Arts
- Compare graphics (landscapes, menus, characters etc.) used in games. (1.2.12)
- Critique design 2D images that appear 3D. (1.4.12)

Science
- Research latest developments in the video industry technology (HS-ETS1-4)
- Investigate applicable-careers in STEM fields within the video game industry. (9.2.12)

New Jersey Student Learning Standards

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.5: Describe the career opportunities and means to achieve those opportunities in each of the Arts, A/V Technology & Communications Career Pathways.
- 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.3: Analyze and create two and three-dimensional visual art forms using various media.

INFORMATION TECHNOLOGY CAREER CLUSTER

- 9.3.IT.6: Describe trends in emerging and evolving computer technologies and their influence on IT practices.

PATHWAY: INFORMATION SUPPORT & SERVICES (IT-SUP)

- 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.5: Demonstrate an understanding of the breadth of career opportunities and means to those opportunities in each of the Science, Technology, Engineering & Mathematics Career Pathways.
- 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 01.1 – 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 05 – Describe the career opportunities and means to achieve those opportunities in each of the Arts, A/V Technology & Communications Career Pathways.

- AR 05.1 – Locate career opportunities that appeal to personal career goals.
- AR 05.2 – Match personal interests and aptitudes to selected careers.
- AR 05.4 – Identify pathways with common knowledge and skills that provide a worker with the potential for mobility.

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 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.

Information Technology Career Cluster (IT)

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 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 06.4 - 4. Acquire and produce content for a digital communication product.

Common Core State Standards (CCSS)

CCSS - English-Language Arts

Comprehension and Collaboration:

- CCSS.ELA-LITERACY. SL.12.1a. Come to discussions prepared, having read material under study; explicitly draw on that preparation by referring to evidence from texts on the topic or issue to stimulate a thoughtful, well- reasoned exchange of ideas

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

Common Core State Standards (CCSS)

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.

CCSS – Social Studies

- CCSS.MATH.CONTENT.WHST.9-10.8 Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the usefulness of each source in answering the research question; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and following a standard format for citation.

Course: Game Development II Unit: 1 – Game Development I Review with a Focus on 2D vs. 3D Grade Level: 10-12	Unit Overview: Students will, review and display an understanding of concepts, and a mastery of skills covered in, game design 1. This unit will cover the history of video games with a focus on 3D videos games. Students will also review how a video game is developed and the roles of the programmer, designer, artist, and writer. They will also display an understanding of the elements and principles of design, the difference between patterns and textures and the proper uses for each, and what makes a good video game.

New Jersey Student Learning Standards (NJSLS): 9.1.12.E.4, 9.3.12.AR.1, 9.3.12.AR.3, 9.3.12.AR.4, 9.3.12.AR.5, 9.3.12.AR.6, 9.3.12.AR-VIS.3, 9.3.IT.6, 9.3.IT-SUP.3, 9.3.IT-PRG.4, 9.3.IT-PRG.5, 9.3.IT-PRG.6, 9.3.IT-PRG.7, 9.3.IT-PRG.10, 9.3.ST.5, 9.3.ST.6, 9.3.ST-ET.3, 9.3.ST-ET.4

Common Career Technical Core (CCTC): AR 01.1, AR 03.3 – 3, AR 05.1, AR 05.2, AR 05.4, AR 06.1, AR 06.2, AR VIS 01.5, AR VIS 03.1, AR VIS 03.3, IT 07.1, IT 07.2, IT WD 04.1, IT WD 06.4 - 4

Common Core State Standards (CCSS): W.11-12.10, SL.12.1a, RI.12.4, RI.12.4, W.12.9b, HSS.G.GMD.4, HSS.G.MG.1, HSS.G.MG.14, HSS. G.CO.2, G.CO.3, G.CO.4, G.CO.5, CCSS.MATH.CONTENT.WHST.9-10.8

Student Learning Objectives (SLOs)	Essential Questions	Skills & Indicators	Sample Activities	Resources
Examine the history of 3D video games, where it all began, key moments in history, and potential future outlook. Examine the visual and technical evolution of 2D video games, including; comparing and contrasting cartoony vs realistic visuals, platform technical requirements,	How do we as humans rely on technology in today's society? How has technology evolved throughout human history? How has technology helped to extend human capabilities throughout history?	- Acquire a historical and social vocabulary. - Identify Game types: console, social, mobile, PC web browser, - Identify game genres - Compare and contrast different game mechanics. - Analyze Ethical	**Graphic Organizer** Create a three column graphic organizer outlining the evolution of the art, technology, and story telling capabilities used in video games. **Think Pair Share** How has technology made for entertainment changes the world?	**Video Game History Timeline** http://www.museumofplay.org/about/icheg/video-game-history/timeline **The History of Gaming: An Evolving Community** http://techcrunch.com/2015/10/31/the-history-of-gaming-an-evolving-

Student Learning Objectives (SLOs)	Essential Questions	Skills & Indicators	Sample Activities	Resources
and advances in technology. **NJSLS:** 9.1.12.E.4, 9.3.12.AR.1, 9.3.12.AR.4, 9.3.12.AR.6, 9.3.IT.6, **CCTC:** AR03.3-3, AR 06.1, AR 06.2, AR VIS 03.3 **CCSS:** CCSS.ELA-LITERACY.SL.12.1A, CCSS.ELA-LITERACY.RI.12.4, CCSS.ELA-LITERACY.W.12.9B, CSS.MATH.CONTENT.WHST.9-10.8	Why is it now so important for average citizens to become technologically literate? How are science, technology, engineering, and math interrelated? Do violent video games make children violent? Does the genre of game guide art style? What makes one game better then another? How can technical advances make it harder to make a good game?	Issues: mature content, online content laws and user privacy. ▪ Understand the evolution of technology in the video game industry. ▪ Identify the video game industry's place in the American economy. ▪ Comparing and contrasting who played video games historically vs who plays them now ▪ Analyze change in perceptions of video games and the people who the play them over the years ▪ Analyze the social affect videogames have had on the world. ▪ Analyze the economical affect	What are some of the positive and negative effects? **Accountable Discussion** Students discuss who are the most contributors to video game history. **Editorial** Write an editorial on the topic of violence in video games and its effect on the youth. **Graphic Organizer** Create a graphic organizer detailing the economic growth of video games. **Venn Diagram** Create a venn diagram detailing the target audience for certain genre of video games. **Think Pair Share**	community/ **The Video Game Revolution** http://www.pbs.org/kcts/videogamerevolution/history/ **Impact of Video Games** http://www.pbs.org/kcts/videogamerevolution/impact/index.html **Video Games and Gender** http://www.radford.edu/~mzorrilla2/thesis/effectsongender.html **The Economics of Video Games** https://www.washingtonpost.com/news/wonk/wp/2012/09/28/the-economics-of-video-games/?utm_term=.58460f71e700

Student Learning Objectives (SLOs)	Essential Questions	Skills & Indicators	Sample Activities	Resources
		videogames have had on the world. ■ Describe Impact of the video games on American culture. ■ Discuss controversial issues and be able to express views both verbally and in writing. ■ Understand how video games are marketed and how that has changed through the years. ■ Compare and contrast cartoony and realistic 2D visuals. ■ Analyze the change in system requirements through the years. ■ Examine how the change in technology has affected the types of games being produced. ■ Discuss the recent	Students play a game and the remake version of the game for homework and come into class ready to discuss the differences. **2D Art Critique** Students write a critique on just the art of a 2D game and do a presentation for the class. **Accountable Discussion** How can technical advances make it harder to make a good game?	**The Total Beginner's Guide to Better 2D Game Art** https://www.gamedev.net/resources/_/creative/visual-arts/the-total-beginner's-guide-to-better-2d-game-art-r2959 **The 7 most beautifully animated 2D games** http://www.gamesradar.com/the-7-most-beautifully-animated-2d-games/ **Evolution of Home Video Game Consoles** http://www.hongkiat.com/blog/evolution-of-home-video-game-consoles-1967-2011/

Student Learning Objectives (SLOs)	Essential Questions	Skills & Indicators	Sample Activities	Resources
		rise in 2D, old style, games. ▪ Gain a relevant technical vocabulary. ▪ Gain a relevant visual art vocabulary. ▪ Discuss how limitations can drive creativity.		
Review and display knowledge of the job roles and responsibilities in the video game industry and the video game development process from conception to preproduction to production to distribution to patching. **NJSLS:** 9.3.12.AR.3, 9.3.12.AR.5, 9.3.ST.5 **CCTC:** AR 01.1, AR 03.3-3, AR05.1, AR 05.2, AR 05.4, AR 06.1, AR 06.2,	What is the importance of having a game director? How are the jobs in the video game industry dependent on one another? What are lifestyle implications and physical demands required to be involved in the video game industry? What makes a good game? What roles seem	▪ Understand the organizational structure of video game companies. ▪ Identify the interrelation between engineers, graphic artists, and business professionals in the video game industry. ▪ Acquire a professional vocabulary related to jobs in the video game industry. ▪ Understand the economy behind video games,	**Accountable Discussion** Students discuss who are the most important members of a development team? **Short Response** Choose a job role and compare the experience that one has working, in that capacity for a large-scale company versus a small independent company. **Teacher For a Day** Create groups and	**Job Roles in Video Games** http://creativeskillset.org/creative_industries/games/job_roles **Indie Game: The Movie** http://buy.indiegamethemovie.com/ **What Type of Roles are there in the Gaming Industry** http://www.jobsite.co.uk/worklife/type-roles-gaming-industry-12239/

Student Learning Objectives (SLOs)	Essential Questions	Skills & Indicators	Sample Activities	Resources
CCSS: CCSS.ELA-LITERACY.SL.12.1A, CCSS.ELA-LITERACY.RI.12.4, CCSS.ELA-LITERACY.W.12.9B	interesting in game development?	monetization, impact of revenue share ▪ Identify the jobs that exist in the video game industry and their requirements and responsibility. ▪ Identify and analyze a real world product (video game) and discuss the quality of work done by each member of the creation team. ▪ Discuss how jobs and their roles have changed through video game history.	assign each group a job role to research. It will be each group's job to create a lesson where they teach the rest of the class about their assigned job. **Card Sort** Student pairs sort cards with terms and responsibilities that pertain to jobs in the Video Game Industry.	
Develop an original game design document for a 3D game, complete with a description of story, mechanics, goals, rewards, and in game economy. **NJSLS:** 9.3.ST-ET.3, 9.3ST-ET.4	What is the purpose of a Game Design Document? What is the most important aspect of developing a video game? Can story make any	▪ Examine a professional game design document. ▪ Work backwards to create a game design document for a preexisting game. ▪ Understand game mechanics and	**Role Play** Divide the room in to 2 groups. Each group has to come up with a concept for a game, what its art style will be, how it will play, and how they will market the product. Each group has to present their idea to the other.	**Game Development Process** http://gen-game.com/company/game-development-process/ **The Anatomy of a Design Document** http://www.gamasutra.com/view/feature/131791/the_anatomy_of_a_design

Student Learning Objectives (SLOs)	Essential Questions	Skills & Indicators	Sample Activities	Resources
CCTC: AR 01.1, AR03.3-3, AR 05.4, **CCSS:** CCSS.ELA-LITERACY.RI.12.4, CCSS.ELA-LITERACY.W.12.9B	game better? Why to video games need a reward system?	develop mechanics for an original game. ■ Develop a story for an original game. ■ Understand the goals an reward system used in video games. ■ Develop and original goals and reward system. ■ Develop an original game design document for a 2D Game.		_document_.php **How (and Why) to Write a Great Game Design Document** https://gamedevelopment.tutsplus.com/articles/how-and-why-to-write-a-great-game-design-document--cms-23545
Review and show knowledge of the principles of design and the ways that artists use the elements of art in a work of art and the significance of color in art and how basic shapes are different for villains and heroes. **NJSLS:** 9.3.12.AR-VIS.3, 9.3.IT-SUP.3, 9.3.ST.6,	Is it important for a video game to have a visual identity? What is the main objective of graphics? How has technology affected 2D? Video games?	■ Analyze the use of balance in 2D art. ■ Recognize and explain how Emphasis is used in art and why it is important in 2D games. ■ Discern how movement can be achieved visually in a still image. ■ Compare and	**Logo creation** Students use vector based graphic design software to create a personal logo that they will use as their signature on the work they create for the rest of the year. **Digital Collage** Students use personal and public images to create a multilayered collage on a theme of	**Principles of Design** https://www.getty.edu/education/teachers/building_lessons/principles_design.pdf **ELEMENTS OF ART** http://www.oberlin.edu/amam/asia/sculpture/documents/vocabulary.pdf **A programmer's guide to creating art for your game**

Student Learning Objectives (SLOs)	Essential Questions	Skills & Indicators	Sample Activities	Resources
CCTC: AR VIS 01.5, AR VIS 03.1, IT 07.1, IT07.2, IT WD 04.1, IT WD 06.4-4 **CCSS:** CCSS.ELA-LITERACY.W.12.9B, CSS.MATH.CONTENT.HSS.G.GMD.4, CCSS.ELA-LITERACY.W.12.9B, CSS.MATH.CONTENT.HSS.G.MG.14, CCSS.ELA-LITERACY.W.12.9B, CSS.MATH.CONTENT.HSS.G.CO.2, G.CO.3, G.CO.4, G.CO.5		contrast Pattern and repetition as it pertains to art. ▪ Understand how proportion is used in a 2D world to create the illusion of 3D space. ▪ Compare and contrast how variety and unity are used in art. ▪	their choice. **Choose a Tutorial** Direct students to teacher approved website that house multiple graphic art tutorials on creating text effects. Student chose a tutorial and work independently on completing the steps.	http://www.gamefromscratch.com/post/2013/06/11/Creating-art-for-your-game-when-you-are-a-programmer.aspx
Review and show knowledge of what a texture and a pattern is and how they are used in graphic design. Dissect the graphics of 3D games and understand	How can I use raster Painting tools to create a texture or pattern similar to one I could create outside of the computer?	▪ Understand the difference between patterns and textures and the proper uses for each. ▪ Identify ways to combine textures and	**Pattern Creation** Students create an original seamless pattern in a vector based graphic design program. **Texture Creation**	**Vanseo Design – Structure as Patterns and Textures** http://vanseodesign.com/web-design/structures-patterns-textures/

Student Learning Objectives (SLOs)	Essential Questions	Skills & Indicators	Sample Activities	Resources
the rules, parameters for, and limitations of creating graphics designed specifically for 3D games and simple 3D animation. **NJSLS:** 9.3.12.AR-VIS.3, 9.3.IT-SUP.3, 9.3.ST.6, **CCTC:** AR VIS 03.1, IT 07.1, IT07.2, IT WD 04.1, IT WD 06.4-4 **CCSS:** CCSS.ELA-LITERACY.W.12.9B, CSS.MATH.CONTENT.HSS.G.GMD.4, CCSS.ELA-LITERACY.W.12.9B, CSS.MATH.CONTENT.HSS.G.MG.14, CCSS.ELA-LITERACY.W.12.9B, CSS.MATH.CONTENT.HSS.G.CO.2, G.CO.3,	How are modern tools used to recreate old fashion styles? Why is there resurgence in 2D gaming and graphics? How can a texture or a pattern be used to create the illusion of 3D in a 2D world? What is the importance of having a file naming system? How can background graphics add to a player's over all enjoyment of a game?	patterns to achieve the desired graphical result. ▪ Create a seamless texture for use in a 2D game. ▪ Create a seamless pattern for use in a 2D game. ▪ Combine knowledge of graphic design tools and principles to create a home screen/Main menu for a 2D game. ▪ Discuss how a texture crated the illusion of 3D in 2D art.	Students use a raster based graphic design program to create a texture. **Replicate a Classic Design** Student use royalty free textures found online to recreate a level from a classic game then make changes to make an original level. **Seamless or Not** Use the smart board to show a singular pattern tile to the class and ask them to determine if they think it is seamless. Let them come to a conclusion then reveal the answer.	**Better Effects Using Textures** http://www.hongkiat.com/blog/photoshop-texture-effects/ **Creating a Tile-able Texture in Photoshop** https://www.youtube.com/watch?v=IKGc7qpFzl8 **Royalty Free Textures** http://www.texturemate.com/category/key-words/2d **How to Create a Seamless Pattern in Photoshop** https://www.youtube.com/watch?v=NARVupW2ads

Student Learning Objectives (SLOs)	Essential Questions	Skills & Indicators	Sample Activities	Resources
G.CO.4, G.CO.5				
Dissect and write a critique all the elements of a 3D game. **NJSLS:** 9.3.12.AR-VIS.3, 9.3.IT-SUP.3, 9.3.ST.6, **CCTC:** AR VIS 03.1, IT 07.1, IT07.2, IT WD 04.1, IT WD 06.4-4 **CCSS:** CCSS.ELA-LITERACY.W.12.9B, CSS.MATH.CONTENT.HSS.G.GMD.4, CCSS.ELA-LITERACY.W.12.9B, CSS.MATH.CONTENT.HSS.G.MG.14, CCSS.ELA-LITERACY.W.12.9B, CSS.MATH.CONTENT.HSS.G.CO.2, G.CO.3, G.CO.4, G.CO.5	What knowledge is needed to create aesthetically pleasing video game graphic? Who is the judge of an aesthetically pleasing piece of art? Why is it important to study the work from game artist of the past? Is their work relevant today, and why? Why is it important to understand who the target audience is. What does Design have to do with Math? Where might you use some principals of Math in your game art.	- Discuss the difference between a 3D Model and a mesh. - Understand what a nurb is. - Understand and compare file sizes (kbs, mbs, gbs, tbs) - Understand how file size affects game play back. - Identify and compare and contrast Alias vs Anti-Aliased images. - Understand what 3D walk cycle is. - Translate art from a physical coordinate plane to graphic design software. - Reduce a files size without giving up too much visual quality.	**Reduce File Size** Students are supplied with a large format image and tasked to reduce the file size with out giving up too much quality through trial and error. Students can compare images and file size of their final result. **Visual Dissection of a Classic 3D Game** As a class watch videos of game play and discuss how they this it was composed visually. **Sketch to digital** Students create a sketch on a coordinate grid and then translate it to a graphic design program using plotted points (x,y).	

Student Learning Objectives (SLOs)	Essential Questions	Skills & Indicators	Sample Activities	Resources
	Why is it so important to understand the Elements and Principals of Design when looking at and analyzing 3D video game graphics? What happen when you combine simple graphics with complex game play?			

Paterson Public Schools

Preparing All Children for College and Career

Unit 1 Vocabulary	
A.I.	G.U.I.
accelerometer	gamer
Alignment	Genre
Alpha Channel	Gradient
analog control	Grid
Anchor Ponit	Harmony
arcade game	JPEG
backward compatible	M.M.O.G.
beta	M.M.O.R.P.G.
bundling	Mockup
C.G.	N.P.C.
CMYK	Negative Space
Console	Opacity
Contrast	Pattern
Crop	PNG
cut-scene	Raster Image
demo	Resolution
downwardly compatible	RGB
DPI	RTS
E.S.R.B.	sandbox
edutainment	Seamless
end user	simulation
Ethical	spoiler
Filter	Sprite
Focal Point	Stealth
Font	Texture
Frame Rate	third-person
Frames	Transparency
	Vector Image

Suggested Unit Projects	
Choose At Least One	
In pairs, complete a game design document for a 3D game that already exists.	Student groups research an important moment in video game history and teach the class about that moment and its significance.

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 your, New York 10128 http://www.cooperhewitt.org/visit/getting-here/