PATERSON PUBLIC SCHOOLS

Preparing All Children for College and Career

Department of College and Career Readiness

Game Development: 2D/3D Modeling Curriculum

5.0 Credits

Unit One

Game Development: 2D/3D Modeling

Course Description

This course provides an introduction to 2D and 3D video game history, design, theory, development, and programming. Emphasis is placed on understanding the history of video games and analyzing industry roles, game genres, game play, art design, playability, storytelling, rule dynamics and what makes quality game. In the first half of the course, students will be responsible for every aspect of creating a 2D game. This will entail preplanning, 2D art creation, 2D animation creation, creating music and sound effects, creating rules and balance for the game, and testing the game for bugs and playability. The second half of the course extends to the introduction to 3D modeling, 3D Animation, 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.

Game Development: 2D/3D Modeling

Pacing Guide		
Unit	**Topic**	**Suggested Timing**
Unit 1	Video Game History & Theory, and Understanding and Creating 2D Graphics	approx. 6 weeks
Unit 2	2D Game Development, Design, and Creation	approx. 10 weeks
Unit 3	3D Modeling, Texturing, and Lighting	approx. 9 weeks
Unit 4	3D Game Development, Design, and Creation	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.

- 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.

➢ **Creativity and Innovation**

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

➢ **Digital Citizenship**

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

➢ **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.

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.

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.

CRP3. Attend to personal health and financial well-being.
Career-ready individuals understand the relationship between personal health, workplace performance and personal well-being; they act on that understanding to regularly practice healthy diet, exercise and mental health activities. Career-ready individuals also take regular action to contribute to their personal financial well-being, understanding that personal financial security provides the peace of mind required to contribute more fully to their own career success.

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.

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.

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.

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.

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.

CRP9. Model integrity, ethical leadership and effective management.
Career-ready individuals consistently act in ways that align personal and community-held ideals and principles while employing strategies to positively influence others in the workplace. They have a clear understanding of integrity and act on this understanding in every decision. They use a variety of means to positively impact the directions and actions of a team or organization, and they apply insights into human behavior to change others' action, attitudes and/or beliefs. They recognize the near-term and long-term effects that management's actions and attitudes can have on productivity, morals and organizational culture.

CRP10. Plan education and career paths aligned to personal goals.
Career-ready individuals take personal ownership of their own education and career goals, and they regularly act on a plan to attain these goals. They understand their own career interests, preferences, goals, and requirements. They have perspective regarding the pathways available to them and the time, effort, experience and other requirements to pursue each, including a path of entrepreneurship. They recognize the value of each step in the education and experiential process, and they recognize that nearly all career paths require ongoing education and experience. They seek counselors, mentors, and other experts to assist in the planning and execution of career and personal goals.

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.

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.

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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

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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

Interdisciplinary Connections

English Language Arts
- Story writing
- Close reading of industry-related content
- Keep a running word wall of industry vocabulary

Social Studies
- Research the history of a given industry/profession
- Use historical references to solve problems
- Research the social impact of a given career or industry

World Language
- Translate industry-content
- Create a translated index of industry vocabulary

Math
- Use geometry to create objects
- Create objects and shapes on a coordinate plane
- Assign variables and values for the variables

Fine & Performing Arts
- Create graphics (landscapes, menus, characters etc.) for use in game.
- Design 2D images that appear 3D.

Science
- Research latest developments in industry technology
- Investigate applicable-careers in STEM fields
- Use physics to create believable movements in game

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.

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Course: Game Development 2D/3D Modeling **Unit:** 1 – History of Video Games, Job Roles in the Video Game Industry, and understanding and Creating 2D Graphics **Grade Level:** 9-12	**Unit Overview:** This unit will cover the history of video games with a focus on 2D videos games and serve as an introduction to 2D graphics creation. Students will learn how video games have evolved over the years and understand how they have influenced society. They will also be introduced to how a video game is developed and the roles of the programmer, designer, artist, and writer. They will assume the role of the artist and use graphic software to create 2D images to be used in a 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 video games, its visual and technical evolution, and how video games have affected society. **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,	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	▪ Acquire a historical and social vocabulary. ▪ Describe Impact of the video games on American culture. ▪ Identify Game types: console, social, mobile, PC web browser, genres and	**Graphic Organizer** Create a three column graphic organizer outlining the evolution of the art, technology, and story telling capabilities used in video games. **Editorial** Write an editorial on the	**Video Game History Timeline** http://www.museumofplay.org/about/icheg/video-game-history/timeline **The History of Gaming: An Evolving Community** http://techcrunch.com/20

Student Learning Objectives (SLOs)	Essential Questions	Skills & Indicators	Sample Activities	Resources
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	capabilities throughout history? Why is it now so important for average citizens to become technologically literate? How are science, technology, engineering, and math interrelated?	game mechanics. ▪ Analyze Ethical 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. ▪ Discuss controversial issues and be able to express views both verbally and in writing.	topic of violence in video games and its effect on the youth. **Think Pair Share** How has technology made for entertainment changes the world? What are some of the positive and negative effects?	15/10/31/the-history-of-gaming-an-evolving-community/ **Impact of Video Games** http://www.pbs.org/kcts/videogamerevolution/impact/index.html
Understand and evaluate the job roles and responsibilities in the video game industry. **NJSLS:** 9.3.12.AR.3, 9.3.12.AR.5, 9.3.ST.5	What is the importance of having a game director? How are the jobs in the video game industry dependent on one	▪ Understand the organizational structure of video game companies. ▪ Identify the interrelation between engineers, graphic	**Accountable Discussion** Students discuss who are the most important members of a development team?	**Job Roles in Video Games** http://creativeskillset.org/creative_industries/games/job_roles

Student Learning Objectives (SLOs)	Essential Questions	Skills & Indicators	Sample Activities	Resources
CCTC: AR 01.1, AR 03.3-3, AR05.1, AR 05.2, AR 05.4, AR 06.1, AR 06.2, **CCSS:** CCSS.ELA-LITERACY.SL.12.1A, CCSS.ELA-LITERACY.RI.12.4, CCSS.ELA-LITERACY.W.12.9B	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 interesting in game development?	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, 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	**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 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.	**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/

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		video game history.		
Understand and evaluate the video game development process and begin to develop a concept for a video game. **NJSLS:** 9.3.ST-ET.3, 9.3ST-ET.4 **CCTC:** AR 01.1, AR03.3-3, AR 05.4, **CCSS:** CCSS.ELA-LITERACY.RI.12.4, CCSS.ELA-LITERACY.W.12.9B	How does the design process help to produce more successful technologies? How does the proverb "Necessity is the mother of invention" apply to the game development process? Are games art or just entertainment? What is your primary goal as a game developer? From where does the inspiration for an idea come?	▪ Acquire a professional vocabulary related to video game development process. ▪ Identify the importance of preplanning. ▪ Discuss how knowing your limitations (financial and technical) can help with the development of a game process. ▪ Understand what a target audience is. ▪ Identify the 4 steps in the video game design process. ▪ Develop and concept for a video game.	**Concept Map** Have students create a concept map of how the development process works. **Guided Notes** Prepare handouts that outline the steps in the development process, the goals of each step, and who takes part in which step of the process; but leave blank spaces for students to fill in key concepts, facts, and definitions. **Venn Diagram** Create a Venn Diagram that compares the goals of each step of the development process. **Role Play** Divide the room in to 2 groups. Each group has	**A Start to Finish Guide for Making a Video Game** http://iml.jou.ufl.edu/projects/s13/pantone-a/index.html **Flow Chart Maker** https://www.draw.io/ **Game Development Process** http://gen-game.com/company/game-development-process/ **Step BY Step Slide** http://www.slideshare.net/bayusembada/game-development-concept

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			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.	
Understand the differences between Raster and Vector images and the appropriate uses for each. Exhibit a basic understanding of the interface and tools in graphic design software. **NJSLS:** 9.3.12.AR-VIS.3, 9.3.IT-SUP.3, 9.3.ST.6, **CCTC:** AR VIS 01.5, AR VIS 03.1, IT 07.1, IT07.2, IT WD 04.1, IT WD 06.4-	Is it important for a video game to have a visual identity? What intermediate Photoshop skills and techniques are essential for effective digital imaging and compositing? What is the main objective of graphics? Why do people have different opinions about artwork?	▪ Understand and work with layers. ▪ Define terms related to digital imaging / graphics design. ▪ Draw and compose in a vector-based software. ▪ Review and identify the elements and principles of design. ▪ Develop graphic design skills using a series of assignments that build progressively. ▪ Identify the different	**Digital Me** Have students upload a photo of themself to a graphic design program and trace the photo to create a digital version of themselves. **Digital Interior Designer 2D** Students take images form the web of things found inside any one room of a home (hardwood floors, kitchen titles, moldings, stove, couch, bed, table etc.).	**The Total Beginner's Guide to Better 2D Game Art** http://www.gamedev.net/page/resources/_/creative/visual-arts/the-total-beginner%E2%80%99s-guide-to-better-2d-game-art-r2959 **Ctrl+Paint Principles of Design** http://www.ctrlpaint.com/videos/?tag=Principles of Design **Photoshop Lady Text**

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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	How has technology affected 2D? Video games? Can color invoke emotion? How does culture shape game graphics? How does the art in video games shape culture?	characteristics and uses of Raster and Vector graphics. ▪ and images warping. ▪ Use Rastor-based software to transform and distort objects. ▪ Work with transparency, filters, gradients, and effects.	They then use graphic design software to manipulate the images to create a room and decorate it. Focus should be on creating the illusion of 3D. **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 their choice. **Choose a Tutorial** Direct students to teacher approved website that house	**Effects** http://www.photoshoplady.com/photoshop-tutorial/category/text-effect/ **TastyTus Beginners Guide to Adobe illustrator** http://www.tastytuts.com/ai-beginners-guide.html **TastyTus Beginners Guide to Adobe Photosho**p http://www.tastytuts.com/ps-beginners-guide.html **Vector vs Raster** https://www.youtube.com/watch?v=LGYOgJWCINM

Student Learning Objectives (SLOs)	Essential Questions	Skills & Indicators	Sample Activities	Resources
			multiple graphic art tutorials on creating text effects. Student chose a tutorial and work independently on completing the steps.	
Understand what a texture and a pattern is and how they are used in graphic design. Create and use textures and patterns to add interest, depth, and a sense of realism to student designs. **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.H	How can I use the blending modes to incorporate textures in raster Images? How can I use raster Painting tools to create a texture or pattern similar to one I could create outside of the computer? 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	▪ Understand the difference between patterns and textures and the proper uses for each. ▪ Identify ways to combine textures and 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.	**Pattern Creation** Students create an original seamless pattern in a vector based graphic design program. **Texture Creation** 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.	**Vanseo Design – Structure as Patterns and Textures** http://vanseodesign.com/web-design/structures-patterns-textures/ **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-

Student Learning Objectives (SLOs)	Essential Questions	Skills & Indicators	Sample Activities	Resources
SS.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	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?	▪ Discuss how a texture crated the illusion of 3D in 2D art.	**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.	words/2d **How to Create a Seamless Pattern in Photoshop** https://www.youtube.com/watch?v=NARVupW2ads
Dissect the graphics of 2D games and understand the rules, parameters for, and limitations of creating graphics designed specifically for 2D games and simple animation. **NJSLS:** 9.3.12.AR-VIS.3, 9.3.IT-SUP.3, 9.3.ST.6, **CCTC:**	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	▪ Discuss the difference between RGB and CMYK graphics. ▪ Understand what a pixel 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	**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 2D Game** As a class watch videos	**How to tackle Character Design for 2D Games.** http://howtonotsuckatgamedesign.com/2014/08/tackle-character-design-2d-games/ **RGB vs CMYK** https://www.youtube.com/watch?v=o5Bx56MGMGo

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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	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. Why is it so important to understand the Elements and Principals of Design when looking at and analyzing 2D video game graphics? What happen when you combine simple graphics with complex game play?	Anti-Aliased images. ▪ Understand what a sprite sheet is and how to create one. ▪ Translate art from a physical coordinate plane to graphic design software. ▪ Reduce a files size without giving up too much visual quality.	of game play and discuss how they this it was composed visually. Where are the tiles? Are the elements raster or vector? Etc. **Spot the Elements from a Sprite Sheet.** Students are given a spite sheet for a game. Play a video of the game play for the class and have the students yell "stop" when they spot an element from the sprite sheet. Pause the video and ask the student to identify what sprite they see using the code from the sheet. **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).	**What are Pixels and How Do They Work** https://www.youtube.com/watch?v=m8c1CAT2zEI **Image File Size Format Glossary** https://quizlet.com/116591013/adobe-photoshop-cc-image-size-file-format-glossary-flash-cards/ **Working with Sprite Sheets** http://kwiksher.com/tutorials_kwik/tutorial-sprites/

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Replace the sprites of an open source video game using graphics they create. **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 are the best practices for file management? How do graphics affect emotion? How are graphics for villainous characters or environments different from those of the hero? How can a visual theme work to make a game more effective and enjoyable? Why is it important to use your hands and traditional tools to create simple designs before jumping on to the computer? How does culture shape game graphics? How does the art in video games shape	▪ Create a visual identity for a video game. ▪ Discuss how graphics add to the feeling a game conveys to the player. ▪ Create an original piece of graphic art inspired by a previous work by a professional game artist. ▪ Understand how the illusion of 3D can be achieved in 2D art using graphic effects ▪ Use graphic design software to translate a comprehensive design into a digital format. ▪ Combine photos, original art work, textures, and patterns to create a visual style for a game.	**Famous Character's Brother/Sister** Students create a character that could be related to a famous video game character. **Digital Movie/TV Set** Students create an environment inspired by a setting from a movie or video game. **Create a Sprite Sheet** Students will create a sprite sheet to use when replacing sprites in an open source game. **Change the Tone of a Game without Altering game Play** Students create graphics with a visual style vastly different from the original game to change its tone and target audience.	**Game Maker Studio** http://www.yoyogames.com/gamemaker **Construct 2** https://www.scirra.com/construct2 **Game Salad** http://gamesalad.com/ **Create a Sprite Sheet for Your own 2D Game** https://www.youtube.com/watch?v=cRE2G96591E

Student Learning Objectives (SLOs)	Essential Questions	Skills & Indicators	Sample Activities	Resources
	culture?			

Unit 1 Vocabulary	
Alpha Channel	Genre
Alignment	Gradient
Anchor Ponit	Grid
CMYK	JPEG
Contrast	Mockup
Crop	Negative Space
DPI	Opacity
Ethical	Pattern
Filter	PNG
Focal Point	Raster Image
Font	Resolution
Frames	RGB
Frame Rate	Seamless
Vector Image	Sprite
	Texture
	Transparency

Suggested Unit Projects	
Choose At Least One	
In pairs, students create a digital version of their partner using photos digital graphics software.	Individually create new graphics for a game that already exists. The goal should be to change the mood and tone of the game with out changing the game play.

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/