Winslow Township School District

Computer Programming for Game Design II

Unit 1: 3D Game Design Basics and Concepts, Design Vocabulary, and Software Modeling Basics

Overview: In this unit, students will cover the concepts of advanced 3D Game Design Principles, will develop a game design document, will be introduced to genre-specific game design issued, will explore various 3D software environments in Blender and Maya, and will be taught the Blender and Maya Graphical User Interface and the software controls.
Students will manipulate and translate object primitives and component selections in Blender and Maya, and will create basic modelled polygonal shapes.
Students will also maintain digital portfolio of programming-specific vocabulary and on-going projects throughout the unit.

<table>
<tr><th>Overview</th><th>Standards for Content</th><th>Unit Focus</th><th>Essential Questions</th></tr>
<tr><td>Unit 1

Elements of Basic Game Design</td><td>• 1.2.12prof.Cr1a
• 1.2.12prof.Cr3a
• 1.2.12prof.Pr5a
• WIDA 1</td><td>• Develop an understanding of 3D Game Design
• Develop a basic vocabulary of words and symbols used in the field of 3D Design.
• Apply correct development techniques that are found in the world of professional 3D Design modeling.
• Examine the ways software can be used to manipulate and translate 3D Game Objects.</td><td rowspan="2">• What is 3D Game Design?
• How does a person create 3D Design Objects?
• What software is used to create 3D Design Objects?
• What tools in the various software packages are used to create 3D Design Objects?
• How are 3D objects manipulated and translated in the software packages?</td></tr>
<tr><td>Unit 1: Enduring Understandings</td><td colspan="2">• Understand the parts of the software screen, and how to open, create, edit, save and retrieve electronic work.
• Understand how to conform to the advanced art guidelines of the Elements and Principles of design.
• Understand and use advanced concepts of a Color Wheel, and how to create color based on the RGB and HSB color systems
• Determine the necessary sequential steps in order to solve this visual problem.
• Develop a working knowledge and function of the software tools necessary in order to solve the design problem.</td></tr>
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Curriculum Unit 1	Standards		Pacing	
			Days	Unit Days
Unit 1: **3D Game Design Basics and Concepts, Vocabulary, and Software Modeling Basics**	1.2.12prof.Cr1a	Formulate multiple ideas using generative methods to develop artistic goals and solve problems in media arts creation processes	20	45
	1.2.12prof.Cr3a	Understand the deliberate choices in organizing and integrating content, stylistic conventions, and media arts principles such as emphasis and tone.	10	
	1.2.12prof.Pr5a	Demonstrate progression in artistic, design, technical, and soft skills, as a result of selecting and fulfilling specified roles in the production of a variety of media artworks.	9	
	Assessment, Re-teach and Extension		6	

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Unit 1 Grade 9-12		
Enduring Understanding	**Indicator #**	**Performance Expectations**
Media arts use a variety of sources such as imagination and creative processes to inspire and transform concepts and ideas into artistic expression.	1.2.12prof.Cr1a	Formulate multiple ideas using generative methods to develop artistic goals and solve problems in media arts creation processes
The forming, integration and refinement of aesthetic components, principles and processes create purpose, meaning and artistic quality in media artworks.	1.2.12prof.Cr3a	Understand the deliberate choices in organizing and integrating content, stylistic conventions, and media arts principles such as emphasis and tone.
Media artists require a range of skills and abilities to creatively solve problems.	1.2.12prof.Pr5a	Demonstrate progression in artistic, design, technical, and soft skills, as a result of selecting and fulfilling specified roles in the production of a variety of media artworks.

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<table>
<tr><th colspan="2">Unit 1 Grade 9-12</th></tr>
<tr><th colspan="2">Assessment Plan</th></tr>
<tr><td>Quarterly Assessment: Production-based
Maintain a project portfolio with journal samples of works produced, reflections, research ideas, notation, videos, photographs, peer evaluations, and instructor grading and critiques
Digital Arts Achieve Performance Assessments
Digital Arts Assessment for Learning</td><td>Alternative Assessments:
Analyzing primary source documents on the growth and development of 3D design objects
Conduct short research projects on the growth and development of 3D design objects.</td></tr>
<tr><th>Resources</th><th>Activities</th></tr>
<tr><td>Software to include: Blender, Maya, Unity, and Unreal, with discussions and sample use of Animate, Dimension, Photoshop (from Adobe) Alias, and Zbrush.
Glossary of terms found at: https://unity.com/how-to/beginner/game-development-terms
Diversity, Equity & Inclusion Educational Resources
https://www.nj.gov/education/standards/dei/</td><td>The instructor will demonstrate and discuss how to navigate through file browsers and the design environments (Unity and Unreal) as well as introduce the parts of the screen and industry terminology.
The instructor will introduce the advanced Elements and Principles of design and the color wheel. The instructor will also present examples of how these guidelines are integrated throughout master artists' works.
Students will be responsible for creating their own digital color wheel.</td></tr>
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Instructional Best Practices and Exemplars	
1. Identifying similarities and differences 2. Summarizing and note taking 3. Reinforcing effort and providing recognition 4. Homework and practice 5. Nonlinguistic representations	6. Cooperative learning 7. Setting objectives and providing feedback 8. Generating and testing hypotheses 9. Cues, questions, and advance organizers 10. Manage response rates

9.1 Personal Financial Literacy - Income And Careers, 9.2 Career Awareness, Exploration, And Preparation - Career Awareness, 9.3 Business Management & Administration Career Cluster & 9.4 Life Literacies and Key Skills

9.1.12.CFR.4: Demonstrate an understanding of the interrelationships among attitudes, assumptions, and patterns of behavior regarding money, saving, investing, and work across cultures.
9.2.12.CAP.2: Develop college and career readiness skills by participating in opportunities such as structured learning experiences, apprenticeships, and dual enrollment programs.
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 three-dimensional visual art forms using various media.
9.4.12.CI.1: Demonstrate the ability to reflect, analyze, and use creative skills and ideas (e.g., 1.1.12prof.CR3a).
9.4.12.CI.2: Identify career pathways that highlight personal talents, skills, and abilities (e.g., 1.4.12prof.CR2b, 2.2.12.LF.8).

The implementation of the 21st Century skills and standards for students of the Winslow Township District is infused in an interdisciplinary format in a variety of curriculum areas that include, English language Arts, Mathematics, School Guidance, Social Studies, Technology, Visual and Performing Arts, Science, Physical Education and Health, and World Language.
Additional opportunities to address 9.1, 9.2 & 9.4:
Philadelphia Mint
https://www.usmint.gov/learn/kids/resources/educational-standards
Different ways to teach Financial Literacy.
https://www.makeuseof.com/tag/10-interactive-financial-websites-teach-kids-money-management-skills/
Additional opportunities to address 9.3:
Graphical User Interface alternatives
https://dev.to/cruip/50-free-tools-and-resources-to-create-awesome-user-interfaces-1c1b

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Modifications for Special Education/504
Students with special needs: The students' needs will be addressed on an individual and grade level using a variety of modalities. Accommodations will be made for those students who need extra time to complete assignment. Support staff will be available to aid students related to IEP specifications. 504 accommodations will also be attended to by all instructional leaders. Physical expectations and modifications, alternative assessments, and scaffolding strategies will be used to support this learning. The use of Universal Design for Learning (UDL) will be considered for all students as teaching strategies are considered. Additional safety precautions will be made along with additional staff so all student can fully participate in the standards associated with this Computer Programming curriculum. • Provide adequate space for students and equipment. • Provide alternative opportunities for coding abilities and oral response choices. • Utilize a variety of communication responses to assist in generating valid and comprehensive evaluations.
Modifications for At-Risk Students
Formative and summative data will be used to monitor student success. At first signs of failure, student work will be reviewed to determine support. This may include parent consultation, basic skills review and differentiation strategies. With considerations to UDL, time may be a factor in overcoming developmental considerations. More time will be made available with a certified instructor to aid students in reaching the standards. • Provide extended time for written responses and projects. • Break down multi-step tasks into smaller chunks • Provide copy of class notes and graphic organizer

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English Language Learners	Modifications for Gifted Students
All WIDA Can Do Descriptors can be found at this link: https://wida.wisc.edu/teach/can-do/descriptors ☐ Grade 9-12 WIDA Can Do Descriptors: ☐ Listening ☐ Speaking ☐ Reading ☐ Writing ☐ Oral Language This particular discipline (as is true with many software-based applications) has many non-English based cues that rely on icons, pictographs, and single-letter shortcuts. For English-based commands (such as File, Open, Save, Exit), the words will be taught in a holistic spiral approach to the ELL student. Icon Walls (similar to word walls) can be constructed and used that the ELL student can reference. For example, a pictograph of an arrow pointed towards an open door universally means "Exit". If that pictograph/word is displayed on this Icon Wall, the student can learn the word (and its pronunciation) during their enrollment in the course. A review of previously studied words can be incorporated into the lesson, to reinforce the word, its pronunciation, and its use in the software. Non-verbal share-pair with English speaking and ELL students will also be incorporated. If possible, the pairing of the ELL student with another student who speaks the native language of the ELL will be incorporated.	Students excelling in mastery of standards will be challenged with complex, high level challenges related to the complexity of the Computer Programming for Game Design II requirements. This will include allowing more opportunities to demonstrate creativity and the design of original output and artifacts. In addition, the following can be utilized: • Alternate Learning Activities/Units: Opportunities to pursue alternate activities permit students to engage in new learning and avoid any monotony of repeating instruction or unnecessary practice in skills already mastered. • Create a distraction-free environment and find a balance where a distraction for one student is an enhancement for another. • Create a detailed report on observations of other students and professional graphic artists. • Offer more time for students to engage in active reflection and movements. Additional Strategies may be located at the links: ❖ Gifted Programming Standards ❖ Webb's Depth of Knowledge Levels and/or Revised Bloom's Taxonomy ❖ REVISED Bloom's Taxonomy Action Verbs

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Interdisciplinary Connections
ELA **NJSLSA.SL1** Prepare for and participate effectively in a range of conversations and collaborations with diverse peers, building on others' ideas and expressing their own clearly and persuasively. **NJSLSA.SL2** Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally. **Social Studies** **6.2.12.EconET.3.a**: Determine how, and the extent to which, scientific and technological changes, transportation, and new forms of energy brought about social, economic, and cultural changes in the world. For this interdisciplinary connection, the student will examine how specific regions of the nation and the world have contributed, and still contribute to, the growth and development of rich technological centers. Discussion of the resources and exports of the Pacific Rim, and technological centers such as Silicon Valley and Silicon Alley contribute to vast employment and economic opportunities.
Integration of Computer Science and Design Thinking Standards NJSLS 8
8.1.12.CS.1: Describe ways in which integrated systems hide underlying implementation details to simplify user experiences. **8.1.12.CS.4:** Develop guidelines that convey systematic troubleshooting strategies that others can use to identify and fix errors. **8.1.12.AP.1:** Design algorithms to solve computational problems using a combination of original and existing algorithms.