

**Winslow Township School District**  
**Computer Programming for Game Design II**  
**Unit 3: Necessary Tools, Camera Movements, and Animation**

**Overview:** In this unit, students will examine and understand the use of the most efficient tools necessary in order to solve an advanced design problem in a timely manner. The student will understand and differentiate between the concepts of zoom, dolly, track, and tumble. The student will understand the essentials of animation, and will learn and understand the 12 principles of animation. Students will also maintain digital portfolio of programming-specific vocabulary and on-going projects throughout the unit.

Overview	Standards for Content	Unit Focus	Essential Questions
<b>Unit 3</b>  <b>Necessary Tools, Camera Movement, and Animation</b>	<ul style="list-style-type: none"> <li>• <b>1.1.12.D.1</b></li> <li>• <b>1.3.12.D.1</b></li> <li>• <b>1.3.12.D.4</b></li> <li>• <b>WIDA 1</b></li> </ul>	<ul style="list-style-type: none"> <li>• Develop an understanding of the use of the most efficient 3D perspectives tools necessary in order to solve a design problem in a timely manner as it applies to Game Design</li> <li>• Recognize and understand the concepts of zoom, dolly, track, and tumble</li> <li>• Recognize and understand the essentials of animation.</li> <li>• Recognize and understand the twelve principles of animation</li> </ul>	<ul style="list-style-type: none"> <li>• What are the most efficient tools necessary in order to solve a design problem in a timely manner?</li> <li>• What are the concepts of zoom, dolly, track, and tumble?</li> <li>• What are the various the essentials of animation?</li> <li>• What are the 12 principles of animation?</li> </ul>
<i>Unit 3:</i> <i>Enduring Understandings</i>	<ul style="list-style-type: none"> <li>• Understand the use of the most efficient tools necessary in order to solve a design problem in a timely manner.</li> <li>• Understand the concepts of zoom, dolly, track, and tumble.</li> <li>• Understand the essentials of animation.</li> <li>• Understand the 12 principles of animation.</li> </ul>		

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Curriculum Unit 3	Standards		Pacing	
			Days	Unit Days
<b>Unit 3:</b> <b>Necessary Tools,</b> <b>Camera</b> <b>Movement, and</b> <b>Animation</b>	<b>1.1.12.D.1</b>	Distinguish innovative applications of the elements of art and principles of design in visual artworks from diverse cultural perspectives and identify specific cross-cultural themes.	10	45
	<b>1.3.12.D.1</b>	Synthesize the elements of art and principles of design in an original portfolio of three-dimensional artworks that reflects personal style and a high degree of technical proficiency and expressivity.	13	
	<b>1.3.12.D.4</b>	Analyze the syntax and compositional and stylistic principles of three-dimensional artworks in multiple art media (including computer-assisted artwork), and interpret themes and symbols suggested by the artworks.	12	
	Assessment, Re-teach and Extension		10	

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Unit 3 Grade 9-12		
Content Statement	Indicator #	Indicator
Common themes exist in artwork from a variety of cultures across time and are communicated through metaphor, symbolism, and allegory	<b>1.1.12.D.1</b>	Distinguish innovative applications of the elements of art and principles of design in visual artworks from diverse cultural perspectives and identify specific cross-cultural themes.
How individuals manipulate the elements of art and principles of design results in original portfolios that reflect choice and personal stylistic nuance.	<b>1.3.12.D.1</b>	Synthesize the elements of art and principles of design in an original portfolio of three-dimensional artworks that reflects personal style and a high degree of technical proficiency and expressivity.
Artists interpret/render themes using traditional art media and methodologies as well as new art media and methodologies	<b>1.3.12.D.4</b>	Analyze the syntax and compositional and stylistic principles of three-dimensional artworks in multiple art media (including computer-assisted artwork), and interpret themes and symbols suggested by the artworks.

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Unit 3 Grade 9-12	
Assessment Plan	
<ul style="list-style-type: none"> <li>• Quarterly Assessment: Production-based</li> <li>• Maintain a project portfolio with journal samples of works produced, reflections, research ideas, notation, videos, photographs, peer evaluations, and instructor grading and critiques</li> <li>• Digital Arts Achieve Performance Assessments</li> <li>• Digital Arts Assessment for Learning</li> </ul>	<p>Alternative Assessments:</p> <ul style="list-style-type: none"> <li>• Analyzing primary source documents on the growth and development of 3D design objects</li> <li>• Conduct short research projects on the growth and development of 3D design objects.</li> </ul>
Resources	Activities
<ul style="list-style-type: none"> <li>• Software to include: Blender, Maya, Unity, and Unreal, with discussions and sample use of Animate, Dimension, Photoshop (from Adobe) Alias, and Zbrush.</li> <li>• Glossary of terms found at: <a href="https://unity.com/how-to/beginner/game-development-terms">https://unity.com/how-to/beginner/game-development-terms</a></li> </ul> <p><b>Diversity, Equity &amp; Inclusion Educational Resources</b>  <a href="https://www.nj.gov/education/standards/dei/">https://www.nj.gov/education/standards/dei/</a></p>	<ul style="list-style-type: none"> <li>• The instructor will demonstrate the selection and use of the most efficient tools necessary in order to solve a design problem in a timely manner</li> <li>• The instructor will introduce the concepts of zoom, dolly, track, and tumble tools that add effects to 3D objects.</li> <li>• The instructor will discuss the essentials of animations.</li> <li>• The instructor will discuss and demonstrate the twelve principles of animation.</li> </ul>
Instructional Best Practices and Exemplars	
<ol style="list-style-type: none"> <li>1. Identifying similarities and differences</li> <li>2. Summarizing and note taking</li> <li>3. Reinforcing effort and providing recognition</li> <li>4. Homework and practice</li> <li>5. Nonlinguistic representations</li> </ol>	<ol style="list-style-type: none"> <li>6. Cooperative learning</li> <li>7. Setting objectives and providing feedback</li> <li>8. Generating and testing hypotheses</li> <li>9. Cues, questions, and advance organizers</li> <li>10. Manage response rates</li> </ol>

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**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.A.3:** Analyze the relationship between various careers and personal earning goals.
- 9.2.12.C.1:** Review career goals and determine steps necessary for attainment.
- 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.

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
<p>All WIDA Can Do Descriptors can be found at this link:  <a href="https://wida.wisc.edu/teach/can-do/descriptors">https://wida.wisc.edu/teach/can-do/descriptors</a></p> <p><input type="checkbox"/> Grade 9-12 WIDA Can Do Descriptors:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Listening <input type="checkbox"/> Speaking <input type="checkbox"/> Reading <input type="checkbox"/> Writing</li> <li><input type="checkbox"/> Oral Language</li> </ul> <p>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.</p> <p>For English-based commands (such as File, Open, Save, Exit), the words will be taught in a holistic spiral approach to the ELL student.</p> <p>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.</p> <p>A review of previously studied words can be incorporated into the lesson, to reinforce the word, its pronunciation, and its use in the software.</p> <p>Non-verbal share-pair with English speaking and ELL students will also be incorporated.</p> <p>If possible, the pairing of the ELL student with another student who speaks the native language of the ELL will be incorporated.</p>	<p>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:</p> <ul style="list-style-type: none"> <li>• 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.</li> <li>• Create a distraction-free environment and find a balance where a distraction for one student is an enhancement for another.</li> <li>• Create a detailed report on observations of other students and professional graphic artists.</li> <li>• Offer more time for students to engage in active reflection and movements.</li> </ul> <p>Additional Strategies may be located at the links:</p> <ul style="list-style-type: none"> <li>❖ <a href="#">Gifted Programming Standards</a></li> <li>❖ <a href="#">Webb’s Depth of Knowledge Levels and/or Revised Bloom’s Taxonomy</a></li> <li>❖ <a href="#">REVISED Bloom’s Taxonomy Action Verbs</a></li> </ul>

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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**

**6.1.12.C.8.b** Relate social, cultural, and technological changes in the interwar period to the rise of a consumer economy and the changing role and status of women. For this interdisciplinary connection, the student will create a series of 3D Game objects of representations diversity among gender, social status, and race, and will design them to animate and interact in a cooperative environment.

**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.