

Winslow Township School District
Computer Programming for Game Design II
Unit 2: Rules of Perspective, Effects, File Formats, Resolution and Compression

Overview: In this unit, students will cover the concepts of 3D visual perspectives, and will develop advanced artifacts that can be incorporated in 3D gaming environments. Students will use standard and advanced tools in the software packages to make these graphics, and will be taught how to edit these 3D images. Students will be taught how to apply effects to these objects (such as shadowing and shading), and will be taught the various graphic image file formats, and the pros and cons of using these formats. Students will also be taught the relationship of Resolution and Compression among the common graphic file formats. 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
Unit 2 Perspectives, Effects, File Formats, Resolution and Compression	<ul style="list-style-type: none"> • 1.1.12.D.1 • 1.3.12.D.1 • 1.3.12.D.4 • WIDA 1 	<ul style="list-style-type: none"> • Develop an understanding of 3D perspectives as it applies to Game Design • Utilize software tools to create 3D images • Utilize software tools to incorporate 3D effects • Recognize the various graphic image file formats, and develop an understanding as to the various pros and cons of creating, saving, and incorporating the various files in other programs, such as gaming environments. • Recognize the distinctions between Resolution and Compression among the varied file formats. 	<ul style="list-style-type: none"> • What are the differences between 2D and 3D perspectives? • What are the various 3D perspective? • What are the various software tools used to create 3D effects? • What are the various image file formats? • What are the pros and cons of using the various file formats for images in game environments? • What are the relationships between Resolution and Compression among the various file formats?
<i>Unit 2: Enduring Understandings</i>	<ul style="list-style-type: none"> • Understand and apply the rules of perspective. • Demonstrate how to create a 3D graphic image, and to add 3D effects. • Recognize and apply the latest file formats. • Understand the relationship between Resolution and Compression. 		

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Curriculum Unit 2	Standards		Pacing	
			Days	Unit Days
Unit 2: Rules of Perspective, Effects, File Formats, Resolution and Compression	1.1.12.D.1	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.	12	45
	1.3.12.D.1	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.	12	
	1.3.12.D.4	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		9	

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Unit 2 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	1.1.12.D.1	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.	1.3.12.D.1	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	1.3.12.D.4	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 2 Grade 9-12	
Assessment Plan	
<ul style="list-style-type: none"> • 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 	<p>Alternative Assessments:</p> <ul style="list-style-type: none"> • 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.
Resources	Activities
<ul style="list-style-type: none"> • 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 <p>Diversity, Equity & Inclusion Educational Resources https://www.nj.gov/education/standards/dei/</p>	<ul style="list-style-type: none"> • The instructor will demonstrate and discuss the differences between 2D and 3D graphic images. • The instructor will introduce tools that add effects to 3D objects. • The instructor will discuss the various file formats, and will discuss the pros and cons of their use. • The instructor will discuss and demonstrate the relationships of Resolution and Compression among the various file formats.
Instructional Best Practices and Exemplars	
<ol style="list-style-type: none"> 1. Identifying similarities and differences 2. Summarizing and note taking 3. Reinforcing effort and providing recognition 4. Homework and practice 5. Nonlinguistic representations 	<ol style="list-style-type: none"> 6. Cooperative learning 7. Setting objectives and providing feedback 8. Generating and testing hypotheses 9. Cues, questions, and advance organizers 10. Manage response rates

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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: https://wida.wisc.edu/teach/can-do/descriptors</p> <p><input type="checkbox"/> Grade 9-12 WIDA Can Do Descriptors:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Listening <input type="checkbox"/> Speaking <input type="checkbox"/> Reading <input type="checkbox"/> Writing <input type="checkbox"/> Oral Language <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"> • 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. <p>Additional Strategies may be located at the links:</p> <ul style="list-style-type: none"> ❖ 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

6.1.12.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.