



Hard Surface Env | Project Brief

Description

In this project, you'll create a real-time production-ready 3D environment using Maya, Marmoset Toolbag 4, Substance Painter, Unreal Engine, and more. The main goal is to develop your skills in the entire process of hard-surface environment art for game development, from initial reference gathering to final presentation. This project will cover various stages including high-poly modeling, low-poly optimization, PBR texturing, lighting, shader development, and rendering.

Learning Objectives:

- Demonstrate proficiency in hard-surface modeling using Maya and Zbrush.
- Create a detailed and accurate high-poly model of a hard surface environment.
- Optimize game-ready meshes with production-ready topology and polycounts.
- Apply PBR texturing techniques using Substance Painter.
- Ensure clean bakes with no artifacts or errors.
- Develop and implement efficient UV layouts with minimal distortion.
- Implement effective lighting and shader techniques.
- Showcase a professional-level presentation of the final model.

Parameters:

- **Asset Type:** Focus on creating a real-time production-ready hard surface environment.
- **Software:** Maya (home), Marmoset Toolbag 4 for baking, Substance Painter for surfacing, Unreal Engine 5 for renders, Photoshop for polishing.
- **Technique:** Emphasize optimized clean UVs and topology. Use crease sets for hard surface subdivision modeling. PBR texturing using layer stacks (generators, fills, filters, etc.)
- **Workflow:** Develop a standardized workflow for 3D asset creation, including high-poly modeling, low-poly optimization, texturing, clean bakes, UV mapping, lighting, and rendering.

Pipeline Steps: Tasks needed to complete our environment.

Tasks	Description
PureRef Board	Collect high-quality references to support hard surface detailing.
Layout	Create a foundational proxy in Maya and Game Engine
Block-in	Establish the form and proportion of the model.
High Poly	Finalize the high poly sculpt in ZBrush.
Optimization	Finalized Topology and UV Layout
Texturing	PBR or Hand-Painted Textures Complete
Integration	Game-Ready Environment Lit and Rendered in Engine
Final Deliverable	March 3rd

Submission:

All deliverables will be submitted under your class sections corresponding UIW3D Forums thread: www.forums.uiw3d.com. They'll be due before the beginning of class on the listed due date. No late assignments will be accepted.

Grading:

See the rubric/grading checklist for the final turn-in for this project. The specifics of each deliverable will be detailed on the forums. Grades will be adjusted based on accurately following the grading checklist outlined below.

Grading Checklist

Earned

Possible

Feedback

PureRef Board	5
PureRef (Reference Board) The reference board should include high-quality and relevant images that are well-organized and annotated. The depth and variety of references should demonstrate a comprehensive understanding of the environmental design elements.	
Layout	5
Layout (Initial Model) The initial model stub should establish the basic structure and form of the environment. The initial topology isn't a priority but needs to provide boundaries and a solid foundation for further development.	
Block-in	10
Block-in (Block-in Models) The block-in model should accurately represent the overall shape and proportions of the environment and everything in it. The topology should be clean, and basic detailing should be evident.	
High Poly	20
High Poly (Final High Poly Model) The final high poly models should be detailed and accurate, with clean and optimized topology built for subdivision. The models need to effectively represent the selected electronic device.	
Optimization	15
Optimization (Final Optimized Model) The final optimized models should be low poly, with a focus on preserving detail while maintaining clean and efficient topology. No unnecessary edges, vertices, or faces. UVs (Clean and Efficient UVs) The UVs should be clean and efficiently laid out, with minimal distortion and optimal use of texture space. UV islands should be logically organized and scaled appropriately.	
Texturing	15
Bakes (Clean Bakes) The final bakes should be clean, with no artifacts or errors. Normal maps, ambient occlusion, and other baked maps should accurately represent the high-poly details. Textures (Final Textures) The final textures should be high-quality, demonstrating proficiency in PBR texturing techniques. Textures should be detailed, realistic, and enhance the overall appearance of the model.	
Integration	10
Rendering (Final Rendered Images) The final rendered images should be of high quality, with effective lighting and composition. The presentation should be professional, showcasing the model from multiple perspectives	
Final Deliverables	20
Submission Final game-ready and production ready source assets. Presentation and portfolio ready renders.	

Total Points Earned

/100