University of the Incarnate Word
School of Media & Design
3D Animation & Game Design

Hard-Surface Prop | Project Brief

Description
In this project, you'll create a real-time production-ready 3D model of an electronic device 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 prop 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 crease sets in Maya.
- Create a detailed and accurate high-poly model of an electronic device.
- 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 model of an electronic device.
- **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.

Assignment Structure: This project will include several deliverables listed below:

Title	Due Date
PureRef (Reference Board)	September 11th
Stub (Initial Model Stub)	September 16th
Block-in (Block-in Model)	September 18th
WIP Polish	September 23rd
WIP High Poly	September 25th
High Poly Asset	September 30th
WIP Optimization	October 2nd
Optimization	October 7th
WIP Textures	October 9th
Final Deliverables	**October 14th**

Submission:
All deliverables will be submitted under your class sections corresponding UIW3D Forums thread: www.forums.uiw3d.com
They will be due before the beginning of class on the listed due date. No late assignments are 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 deliverable requirements outlined there.

Grading Checklist	Earned	Possible	Feedback
Reference and Initial Stages		20	
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 electronic device's design elements			
Stub (Initial Model Stub) The initial model stub should establish the basic structure and form of the electronic device. The initial topology isn't a priority, but needs to			

provide boundariess and a solid foundation for further development

Block-in (Block-in Model)
The block-in model should accurately represent the overall shape and proportions of the electronic device. The topology should be clean, and basic detailing should be evident.

Work in Progress (WIP)	30

WIP Polish
The work in progress polish should show significant refinement of shapes and the addition of secondary details. Evidence of feedback implementation should be apparent, demonstrating an iterative improvement process.

WIP High Poly
The work in progress high poly model should include detailed high-poly elements with clean and accurate topology. The progress should reflect a substantial portion of the final model's scope

WIP Optimization
The initial optimization efforts should focus on reducing unnecessary geometry while maintaining the model's integrity. Feedback implementation should be evident, showing a thoughtful approach to optimization

WIP Textures
The work in progress textures should demonstrate initial texturing efforts, including the application of base materials. Feedback implementation should be evident, showing an iterative approach to texturing

Final Submission	50

High Poly (Final High Poly Model)
The final high poly model should be detailed and accurate, with clean and optimized topology built for subdivision. The model needs to effectively represent the selected electronic device.

Optimization (Final Optimized Model)
The final optimized model 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.

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.

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

Total Points Earned	/100