CS148: *World in a Jar*

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This project explores the dual nature of solitude through the metaphor of a world contained within a glass jar. I wanted to capture how being in your own world can feel comforting yet isolating. The glass jar serves as a symbol of that personal space—inside, a warm reading nook represents solitude's peaceful refuge. The glass acts as a barrier separating this inner world from the outside, and the lighting and depth of field help reinforce that contrast. My goal was to capture both the safety and the distance that come with retreating into your own space. The final render is shown in the figure above.

Variants:

Meeting the Project requirements:

Ray Tracing & Lighting

- My project is rendered using the Cycles engine to leverage of ray tracing, realistic light interaction, and physically based materials. The scene contains multiple light sources that work together to create a warm room atmosphere inside the jar.
- The lamp I modeled from scratch serves as the primary *internal* light source. It uses an emissive shader combined with a point light inside the bulb to generate a soft, warm glow. This glow realistically bleeds onto the character, the books, and the small table surface, demonstrating indirect lighting and color scattering.The light also illuminates the metal lamp handle, which is consistent with expected physical behavior.
- The glass jar uses a custom Principled Glass Shader, which refracts and reflects the internal light sources as well as external ones. The reflections of outside light bulbs on the jar surface, as well as the refractions of objects inside it, demonstrate correct use of Cycles' ray tracing.

Main Geometry From Scratch

Several central objects of the scene were modeled entirely from scratch:

- **The Character**: A stylized, seated figure reading in a contemplative pose. This is the main focal point of the scene, created using simple shapes to form a cohesive, readable silhouette (tutorial referenced below).

- **The Jar**: The iconic jar structure that frames the entire scene. I modeled the glass body with careful attention to thickness, curvature, and rim detail, as well as the threaded lid (tutorial referenced below).
- **The Lamp**: Modeled from scratch using cylinders, spheres, and curve-based details for the bulb, shade, and metal stand (tutorial referenced below).

These three assets are the first elements the viewer's eye notices and form the core of the interior composition.

Additional custom modeling includes the small side table and the cup containing the steam particle effect. These supporting objects were created using primitive manipulation, beveling, and loop-cut techniques to reinforce the cozy reading room aesthetic. Imported assets were limited to secondary decorative elements like books and small props, ensuring the main geometry remained original work.

UV Mapping and Texturing From Scratch

I performed custom UV mapping and texturing workflows for key scene elements:
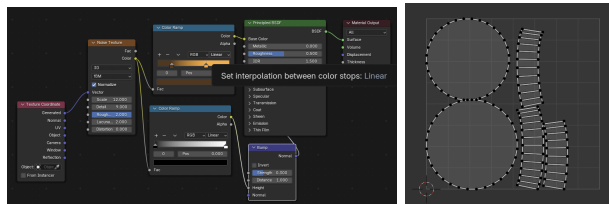
- **Jar Lid Texture**: The lid features a custom UV-unwrapped surface with a textured ceramic-like material, adding tactile realism to the jar's containment (shown above)
- **Glass Shader (Jar)**: The jar's glass material was built from scratch using the Principled BSDF with customized IOR (1.45), roughness, and transmission values to produce realistic reflections and refractions under both internal and external lighting.
- **Lamp Shader**: The lamp includes a glowing emissive core and a textured outer shade. I textured the shade using procedural noise combined with manual roughness mapping to create warm, diffused light that reinforces the cozy atmosphere.
- **Character Texturing**: The stylized character uses basic UV mapping for color variation across clothing and subtle facial details, maintaining visual cohesion with the warm color palette of the reading nook.

These custom materials demonstrate procedural texturing techniques, UV unwrapping workflows, and node-based shader construction in Blender

Advanced Features

To enhance realism and cinematic presentation, I used several advanced Blender features:

- Depth of Field (DOF): I set a shallow depth of field to keep the jar interior sharp while blurring the environment outside. This isolates the character and lamp, emphasizing them as the main focus of the composition.
- Volumetric Effects: I added a small volumetric steam effect rising from the coffee cup using a principled volume shader. While subtle due to the jar's glass material, it contributes to internal light scattering.

Through these features, the final scene demonstrates technically sophisticated lighting, shading, and camera work.

Contributions:

This project was completed individually.
I handled all aspects of pre-production, modeling, shading, lighting, rendering, and debugging myself.

Assets & References:

Main character: *https://www.youtube.com/watch?v=M_PNm3FcU_Q&t=1690s*

   https://www.youtube.com/watch?v=vUEPHy3QQF4

   https://www.youtube.com/watch?v=2CtHqa6Cpv0

Jar and its lid: *https://www.youtube.com/watch?v=NSVEeEMq0KI*

Coffee cup and steam: *https://www.youtube.com/watch?v=_K0XsHht6pg&t=75s*

Coffee table: *https://www.youtube.com/watch?v=m76zjytwqQs*

Lamp: *https://www.youtube.com/watch?v=0wAbqwkFrgs*

Penguin: *Imported* from
https://www.blenderkit.com/get-blenderkit/873fde3f-9352-42d7-8270-4ef5a6ccd56c/

Book shelf: *Imported* from

https://sketchfab.com/3d-models/dusty-old-bookshelf-free-6c5ac2547db34c3c81b2e4808b000386

Octopus: *Imported* from
https://www.blenderkit.com/get-blenderkit/89c6e013-40af-4962-a1f9-7a5a6fb3d100/

Trophy: *Imported* from
https://www.blenderkit.com/get-blenderkit/668a0e31-e290-4cb5-a86c-15cefec24da2/

Ground texture: *Imported* from
https://www.blenderkit.com/get-blenderkit/d00f6684-9a6d-4ba5-902d-15753c45f8db/