**Final Project: Design Decisions**

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The decisions involved with designing a 3D scene often are the difference makers when it comes to conveying not just the objects in a scene accurately, but also the feel of the scene. Many of the decisions I made regarding this scene had to do with the representation, transformation, and rendering of objects, lighting and textures.

The first object that I created for this scene was a mason jar with pens inside of it. I decided to take some artistic liberty when it came to the design of this object, as it is very interesting how it is designed. I started with a cylinder base, then with a slightly thinner cylinder, I crafted the mouth of the jar. Around this thinner cylinder, I constructed two tori that are reminiscent of the ribbed opening of the jar itself, resembling the threading of how the jar should function when given the lid. After this, I made two pens that protruded from the mouth of the jar to resemble the items that were placed in the jar. The artistic liberties mostly coalesce within the use of textures for this object. I thought it would be very interesting to see how it turned out given a wide selection of texture choices for each mesh that came to form this object. With the brick texture for the base cylinder, the concrete textures for the upper cylinder and the tori, and simple blue and red for the pens, I am happy with how it turned out and how it pops in the scene.

The other object in the scene is a bottle of hand soap. This was a simple object to recreate within my 3D scene. I started with a cylinder for the body, then two smaller cylinders that act as the pump for the hand soap. The cylindrical shape of the bottle is very common for many bottle designs, and the nested cylinders for the pump act as the two parts of the pump that slide together to force positive pressure in the bottle. The colors I chose were green for the bottle, which is accurate to the real-life model, and gray for the pump.

The third object in the scene, the lamp, is comprised of a few meshes to form the shape of the object. For the base of the lamp, I chose a cylinder which acts as a circular footprint for the lamp to rest on, the stem of the lamp being a thin cylinder, leading all the way up to the lampshade, which was a cone, common amongst lampshades in real-life, showing a taper from the wider base to the narrower top. Simple texturing, with fabric for the lampshade and metal for the base and stem.

Finally, the last object was an alarm clock. This digital clock seems deceivingly simple to make but having to nest the two boxes within each other so as to not protrude the screen too much was troublesome. Nonetheless, the clock is comprised of a simple box casing textured with a black leather, and the digital screen textured with a glossy gray clock face, to show it is the display of the clock.

For lighting, I chose to have many different light sources, representative of the many windows in the room, and a slightly blue light to represent the artificial illumination from inside the room as well. I believe the choices I made in positioning the different light sources worked out well for adding some depth and perspective to the scene.

Speaking of perspective, there are many ways in which the viewer can explore the scene. For starters, the mouse movement correlates with the view of the camera, swiveling from left to right, and up to down. The key, W A S and D also correlate to the movement of the camera, allowing the viewer to move left, right, up, and down. Another form of viewing is with the O and P keys. Pressing O switches to an orthographic view which gives the viewer a straight on view to approach the scene from a different viewpoint, and pressing P again reverts to the default perspective mode. Also, using the mouse scroll wheel allows the viewer to change the speed at which the camera moves.

The functions I wrote are very modular and reusable. I created separate functions for loading lighting, shapes, textures and materials in order to use only what I needed for my scene, and to allow for more efficient debugging if I felt one function was interacting poorly with another. Each function serves as a separate step in constructing the scene, and can be reused for many other modules.