![A large room

Description automatically generated]()

Cube Mapping Reflective and Refractive Bump-mapped Surfaces

Project 4

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# Images

![A picture containing floor, indoor, wall, building

Description automatically generated]()

Figure 1: Start Picture

![A picture containing floor, indoor, wall, sitting

Description automatically generated]()

Figure 2: uA Adjusted

![A picture containing floor, indoor

Description automatically generated]()

Figure 3: uB Adjusted

![A picture containing indoor, floor, cabinet

Description automatically generated]()

Figure 3: uC Adjusted

![A picture containing floor, indoor, wall

Description automatically generated]()

Figure 5: uD Adjusted

![A picture containing floor, indoor, photo

Description automatically generated]()

Figure 6: uNoiseAmp Adjusted

![A picture containing floor, wall, indoor

Description automatically generated]()

Figure 6: uNoiseFreq Adjusted

![A picture containing indoor, floor, wall

Description automatically generated]()

Figure 7: uETA Adjusted

![A picture containing wall, indoor, floor, sofa

Description automatically generated]()

Figure 8: uMix Adjusted (halfway)

![A picture containing wall, indoor, floor

Description automatically generated]()

Figure 9: uMix Adjusted (All the way)

## Key Code

vec3 vRefractVector = refract( Eye, Normal, uEta );

vec3 vReflectVector = reflect( Eye, Normal );

vec4 refractcolor = textureCube( uRefractUnit, vRefractVector );

vec4 reflectcolor = textureCube( uReflectUnit, vReflectVector );

refractcolor = mix( refractcolor, WHITE, .40 );

## gl\_FragColor = vec4( mix( refractcolor, reflectcolor, uMix ).rgb, 1. );

## Video Link

<https://media.oregonstate.edu/media/t/0_cs3c8pq2>

## Comments

I computed the normal using the same method as project 3. These equations were from both the assignment documentation and the lecture notes. It works because we take and x and y vector on the plane compute or math and take the cross product. This will result in the normal vector. Using that normal the built-in refraction and reflection functions we can get refraction and reflection vectors. Those are mixed together to result in the program seen in the video.