

L21-Lighting and Shading

1.3) Discuss the effects of smooth shading:

Unlike flat shading where the colors change discontinuously at polygon borders, with smooth shading the color changes from pixel to pixel, resulting in a smooth color transition between two adjacent polygons.

1.6) Discuss the effects of subdivision vs smooth shading...

When adding the Subdivision Surface Modifier, the UV sphere changed into a sphere with more which is composed of a “squared” mesh is altered and made the sphere be composed of way more but smaller cubes. In other words, the sphere now has more divisions in its mesh. This along with the smooth shading effects creates a new sphere that looks completely solid, without corners, just like a ball. This can allow us to better the render quality of our 3D objects.

2.2) Compare the rendered checkpoint 1.5 with 2.1...

The difference between these two figures is that 1.5 has a light on it with a power of 1000w while 2.2 has the light in the same spot as 1.5 but with a power of 250w, that only being 25% of the light that we had on our scene before. When lowering the power of the light, the irradiance is also diminished as the light in our surfaces is decreased per unit area.

2.4) Here, checkpoint 1.5 and 2.3 have their light source in different locations. In checkpoint 2.3, we can see that the light on our sphere is way more intense than that of the one in 1.5. This is because in 2.3, we moved the light closer to the sphere. This made the sphere be much more illuminated, making the color white of the sphere more noticeable.

2.6) Compare checkpoint 1.5 with 2.5...

Now that we have an area light, we simulate in checkpoint 2.5 a wider ray of light hitting our sphere. This causes that the shadow created by the sphere in 2.5 is not as intense and dark as the shadow created by the sphere in checkpoint 1.5.

4)

a) For my first image, I made both the UV sphere and the plane metallic. This gave the two objects an interesting property of “shininess” that we see in a lot of metal objects. Another interesting phenomenon of making these objects metallic is that the light bounces off the surfaces differently. This caused that the lower half of my sphere looked green because it was reflecting off the green plane under the sphere.

b) For my second image, I changed the Alpha properties of both objects from 1.0 to 0.5. This was a very interesting effect where basically half of the object’s particles don’t show so our objects almost look transparent from far away but when we zoom in on the objects. It almost looks like half of their mass has been taken out and it looks as the objects are made out of little pixels floating around each other, creating a distinct figure. In this case, those figures being the UV sphere and the plane under it.

c) For my third image, I turned both object’s roughness to -5. I found this to be a very interesting and almost funny effect because it made the objects look extremely smooth and not very convincing that it could be an object in real life; as if it was not a very detailed image. It also made the objects look a bit smoother.