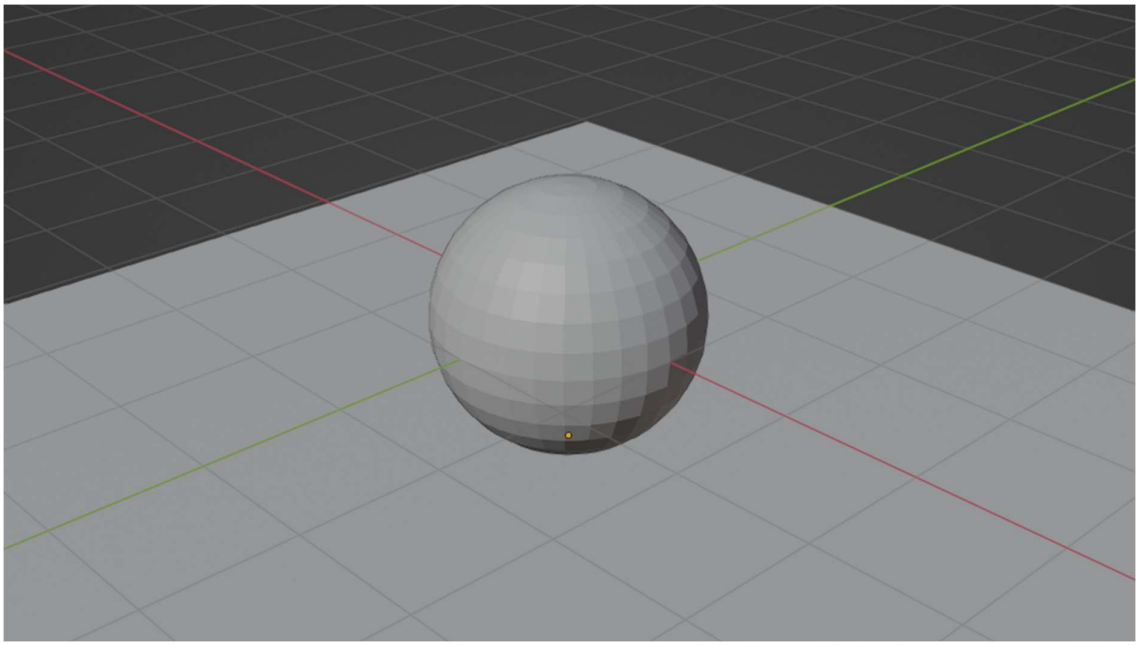
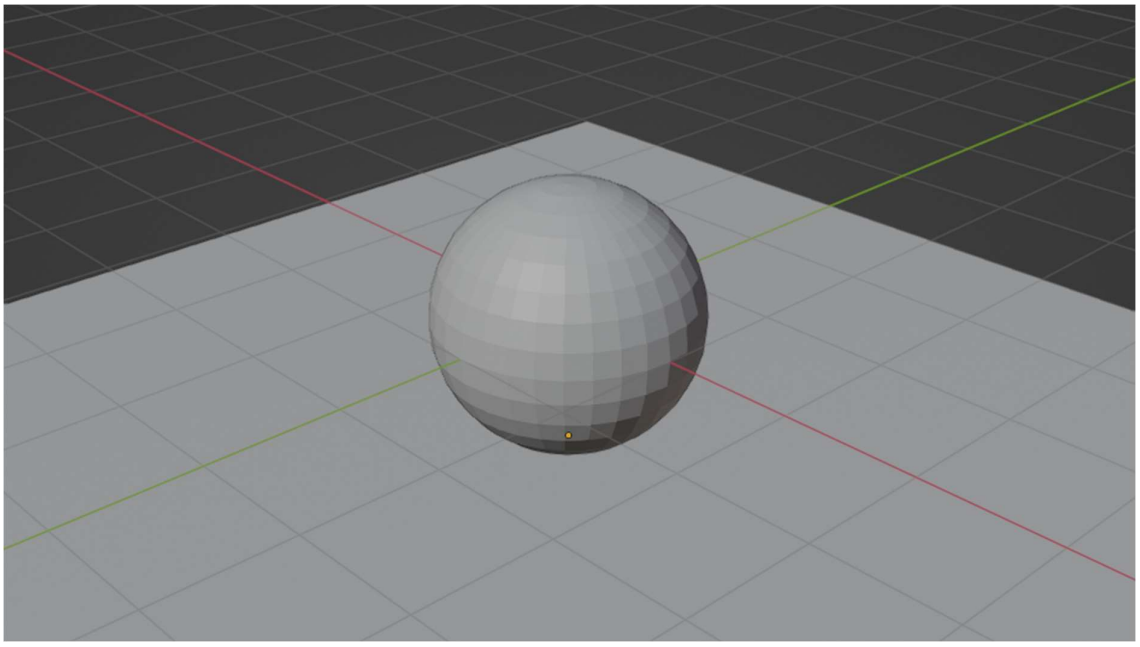
https://github.com/stekunda/blender-activity-3

Checkpoint 1.1: shade flat



Checkpoint 1.2: shade smooth



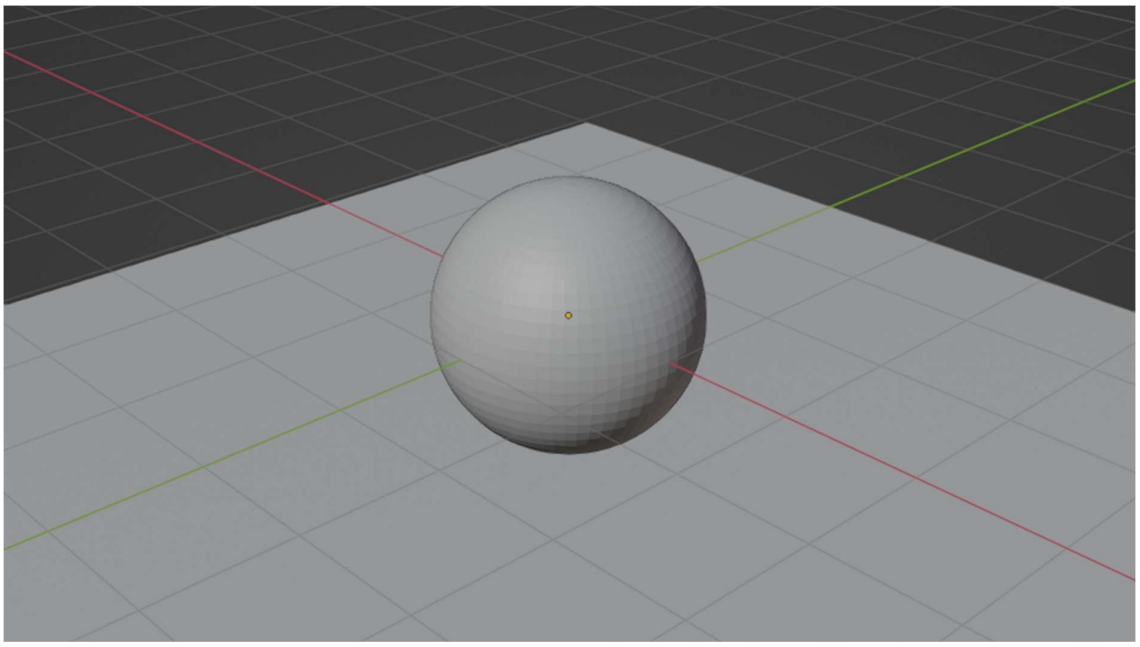
Checkpoint 1.3:

Discuss the effect of smooth shading.

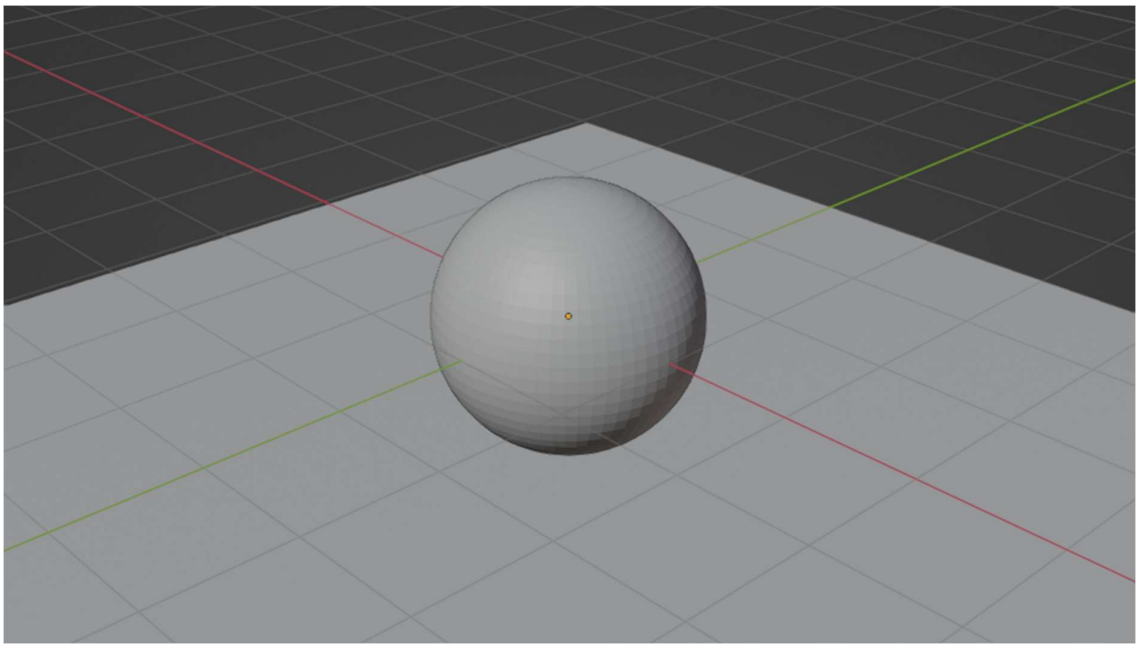
Smooth shading allows 3d models to appear more realistic than it would appear if using flat shading. Smooth shading's effects are more visible when working with 3d models with

curved surfaces like the UV Sphere in this example. Highlights and shadows also look more realistic using smooth shading.

Checkpoint 1.4: subdivision + shade flat



Checkpoint 1.5: subdivision + shade smooth

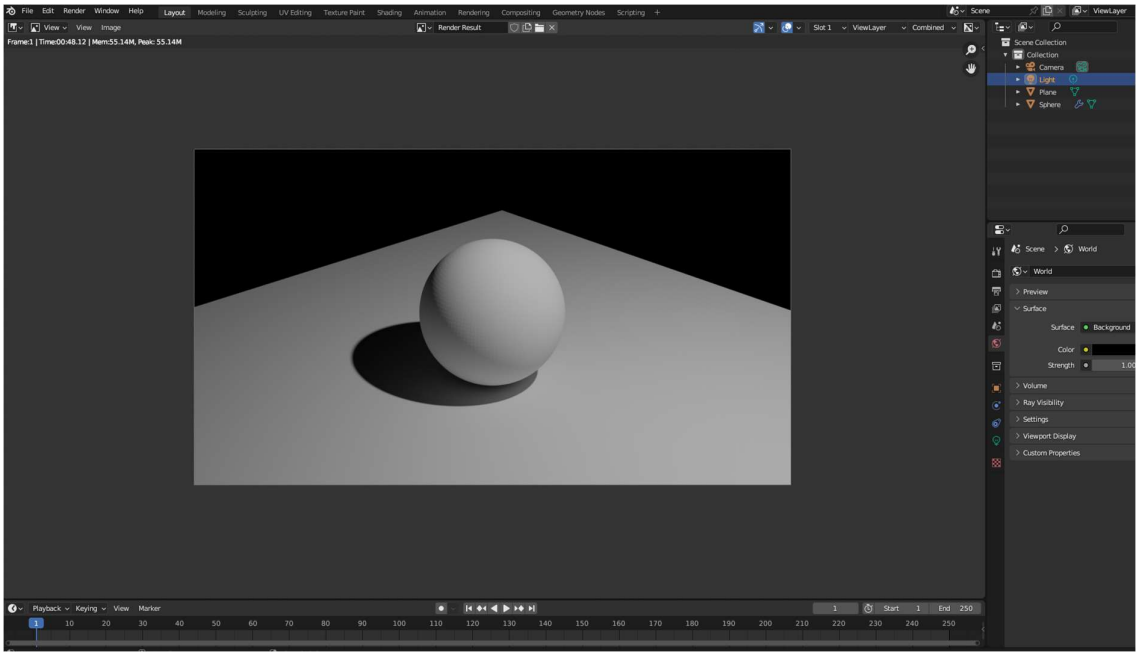


Checkpoint 1.6:

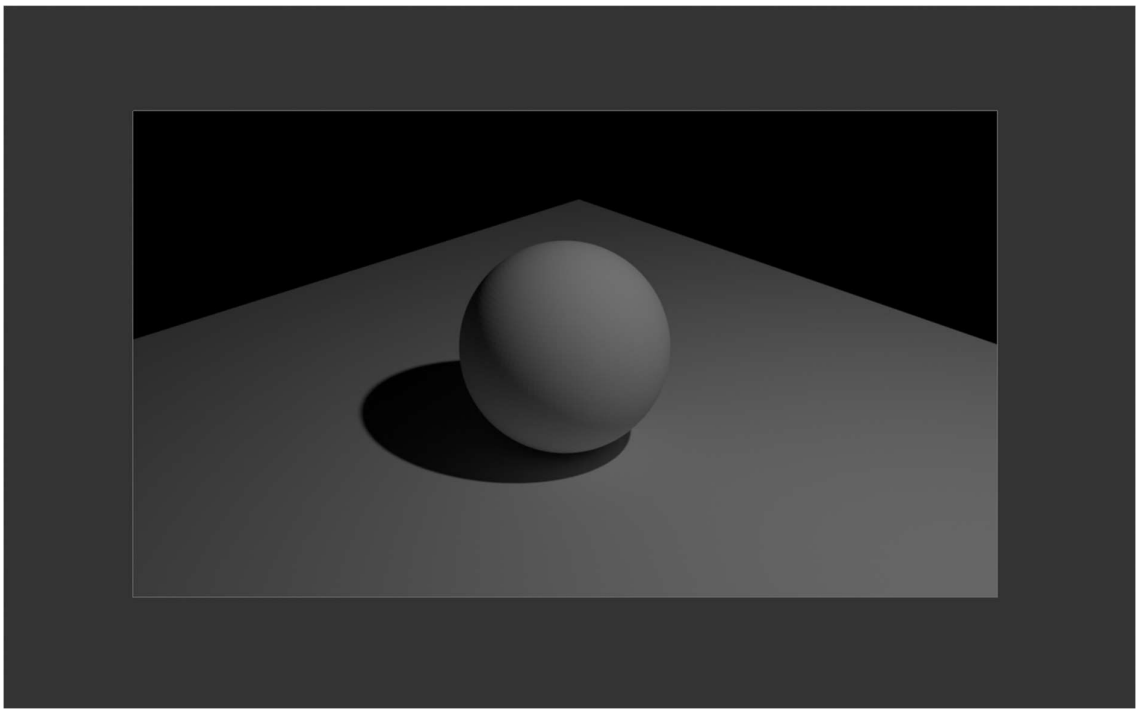
Subdivision divides a polygon surface into smaller and more detailed polygons. It improves the geometric details of a model and makes the curves of the object smoother and more accurate. Smooth shading allows models to appear more realistic than it would appear if using flat shading. It better represents lighting and shadows, making them more realistic. We

can use them in combination where we apply subdivision to certain regions in a scene where the high level of detail is important. We can do this while using smooth shading globally to enhance the overall visual quality.

Re-render checkpoint 1.5: power = 1000



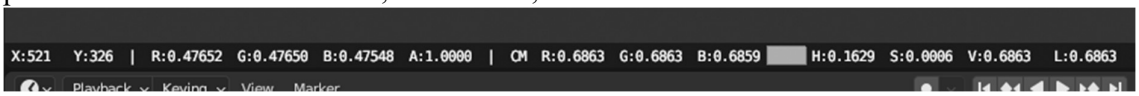
Power = 250



Checkpoint 2.1:

x = 521, y = 326

power = 1000W => R: 0.47652, G: 0.47650, B: 0.47548



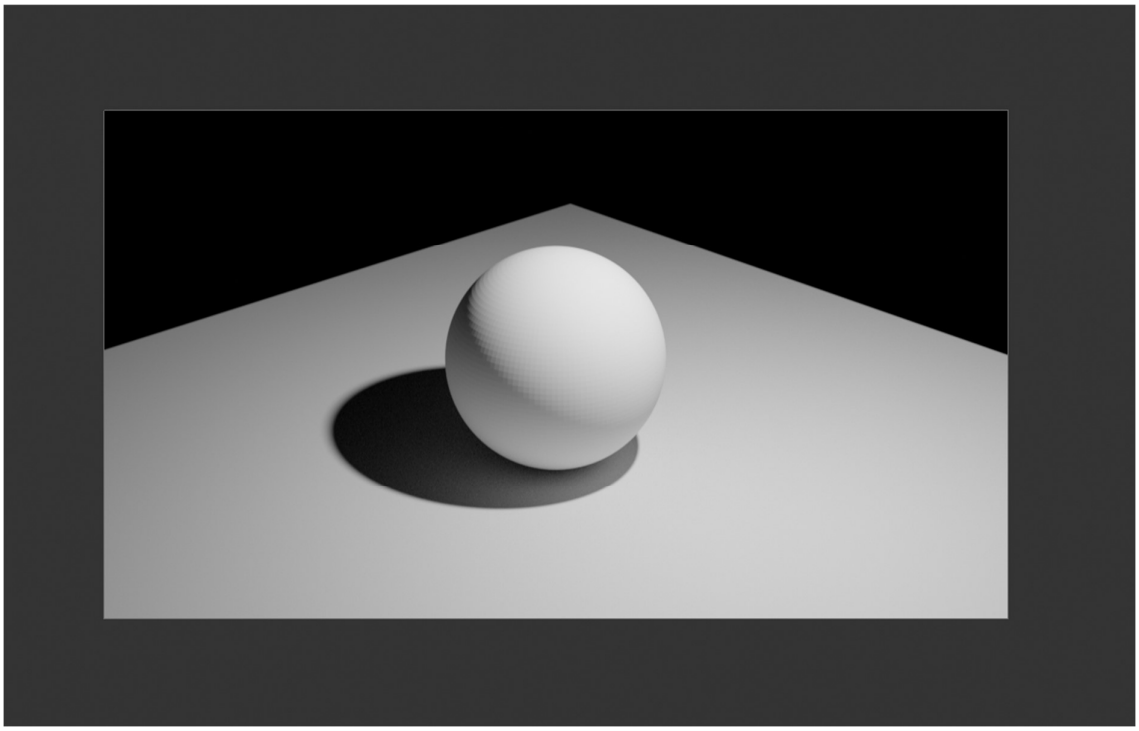
power = 250W => R: 0.11916, G: 0.11915, B: 0.11890

In both scenarios: R > G > B and R, G, and B, all have the same first two values to the right of the decimal point.

Checkpoint 2.2:

The distance between the light and the object is constant in both scenarios. But the rendered checkpoint 1.5 has a light power = 1000 W and checkpoint 2.1 has a light power = 250 W. So checkpoint 1.5 image has a higher irradiance than the image in checkpoint 2.1 because the light power is 4 times greater.

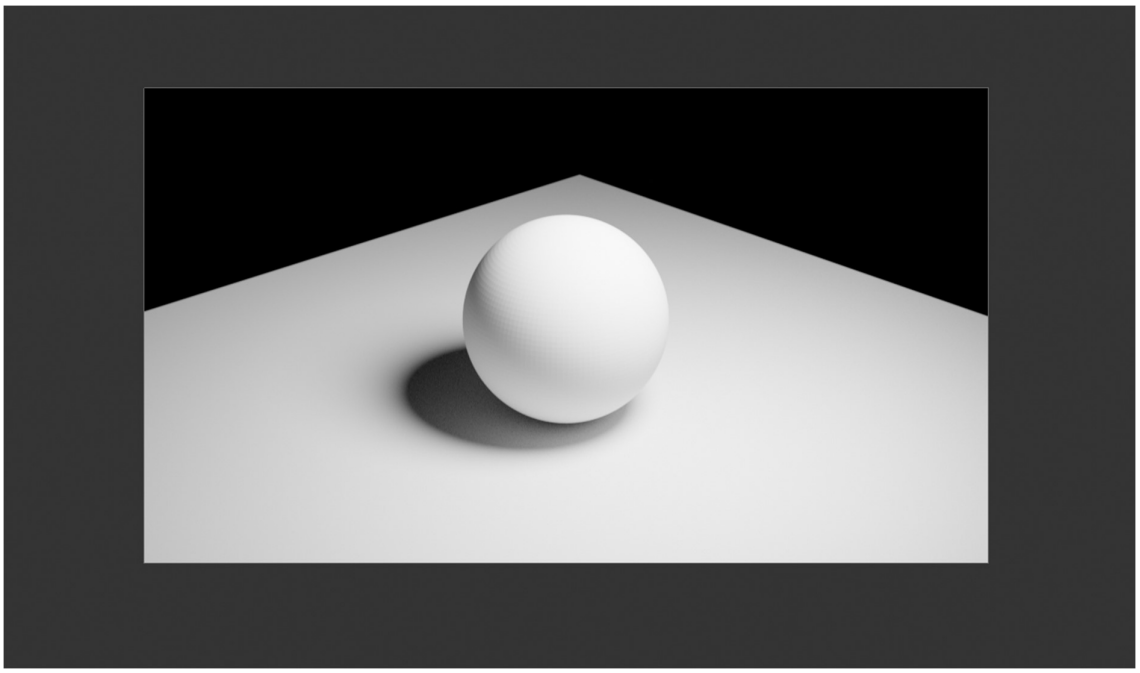
Checkpoint 2.3:



Checkpoint 2.4:

The image in checkpoint 1.5 has the light twice as far away as the image in checkpoint 2.3 so the top of the sphere in checkpoint 2.3 appears much brighter than the image in checkpoint 1.5 where the light is not as focused on a specific spot. As the light distance decreases, the irradiance on the area that the light is pointing towards becomes greater but the area that the light is pointing toward decreases. As the light distance increases, the irradiance on the area that the light is pointing towards decreases.

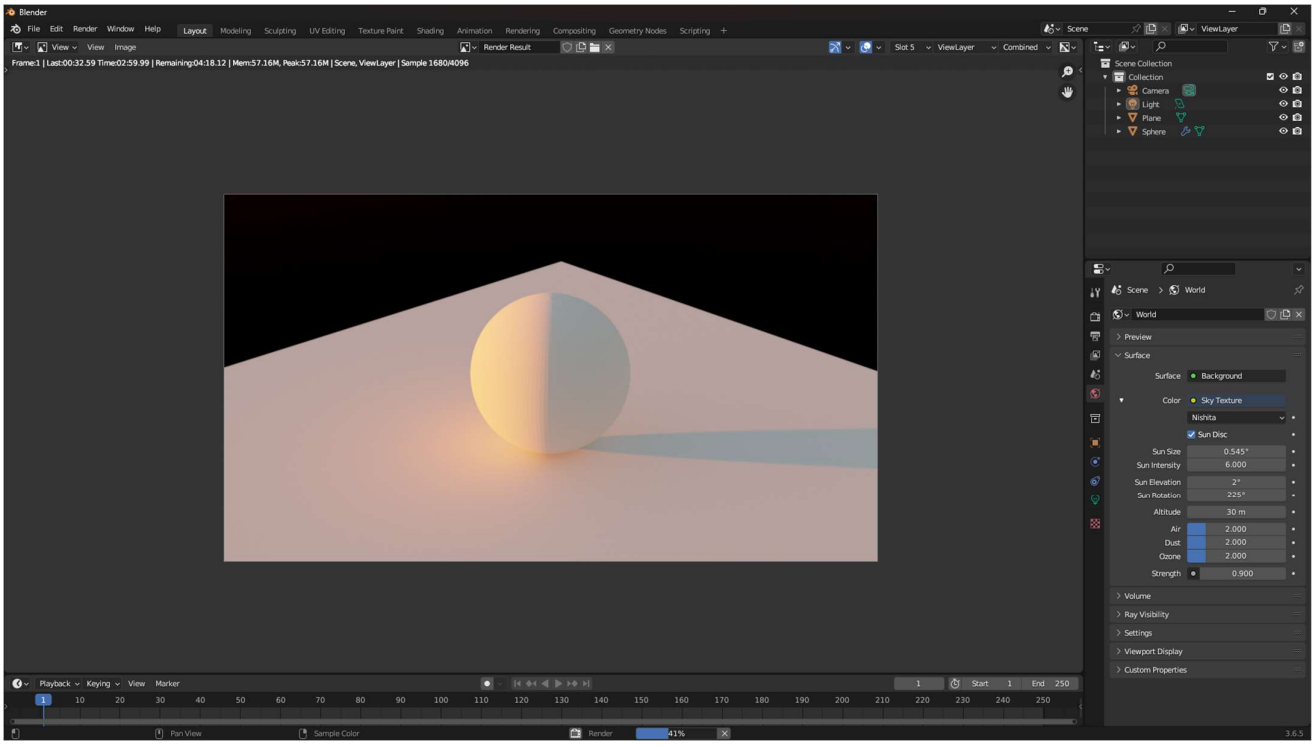
Checkpoint 2.5:



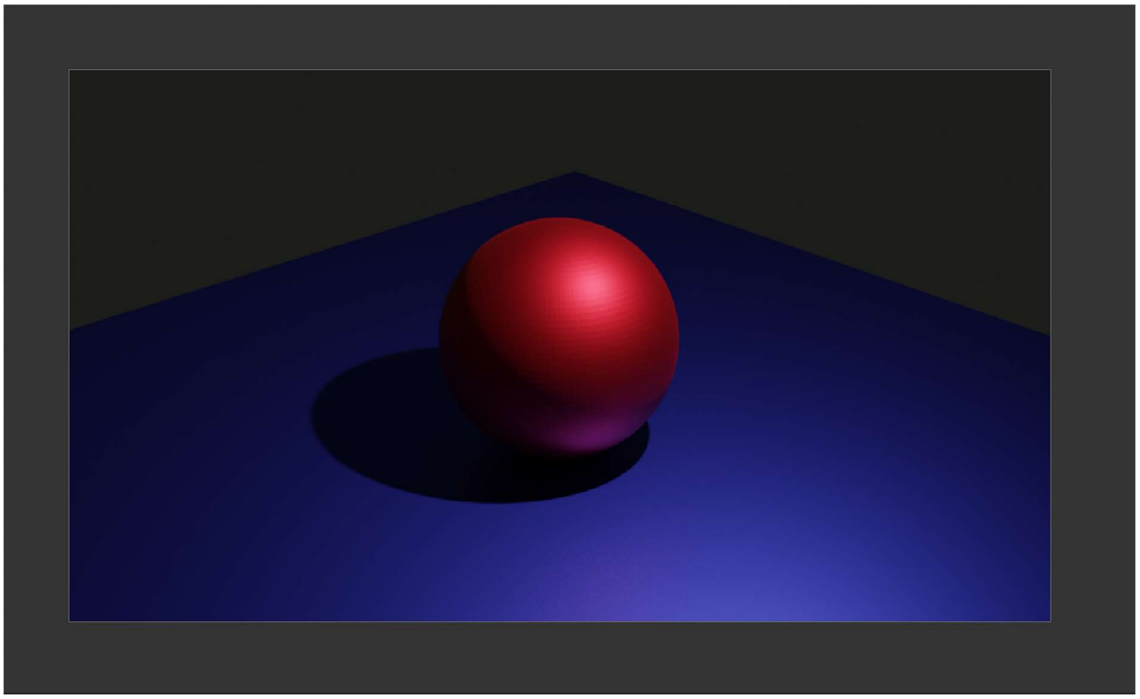
Checkpoint 2.6:

Since the area of the light source is larger, more of the sphere is brighter making it appear whiter in checkpoint 2.5's sphere and the shadow is not as dark compared to the sphere in checkpoint 1.5. In checkpoint 1.5's sphere, the sphere is not as white but it's more grey-colored, the shadow of the sphere is also much darker than checkpoint 2.5's since there is less light area.

Checkpoint 3:

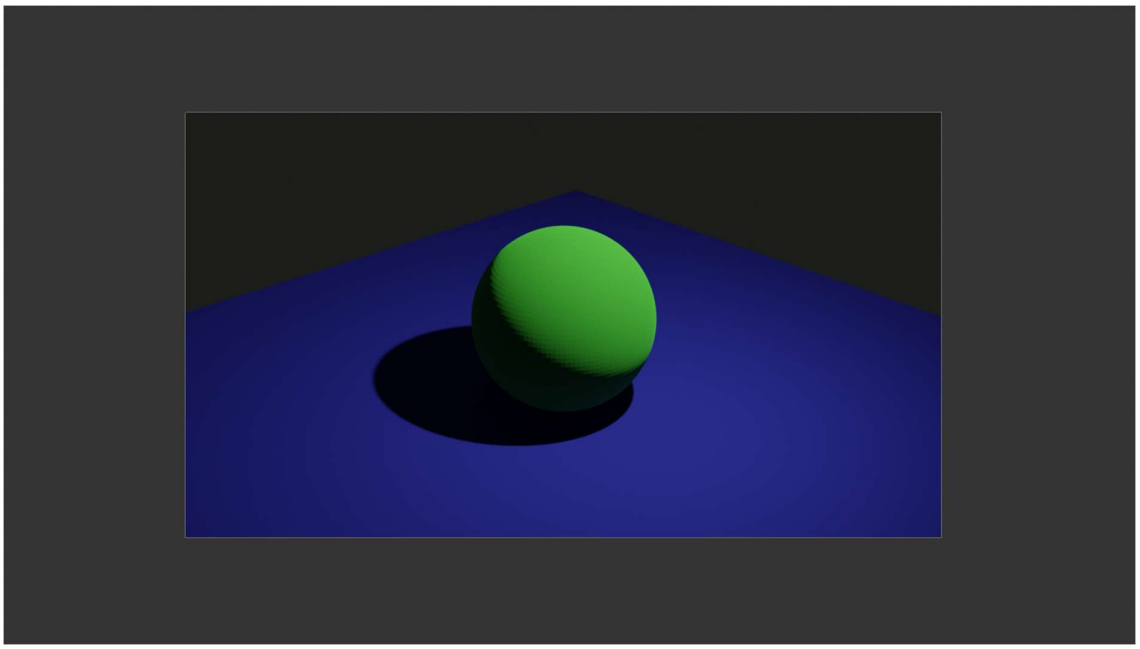


Checkpoint 4:

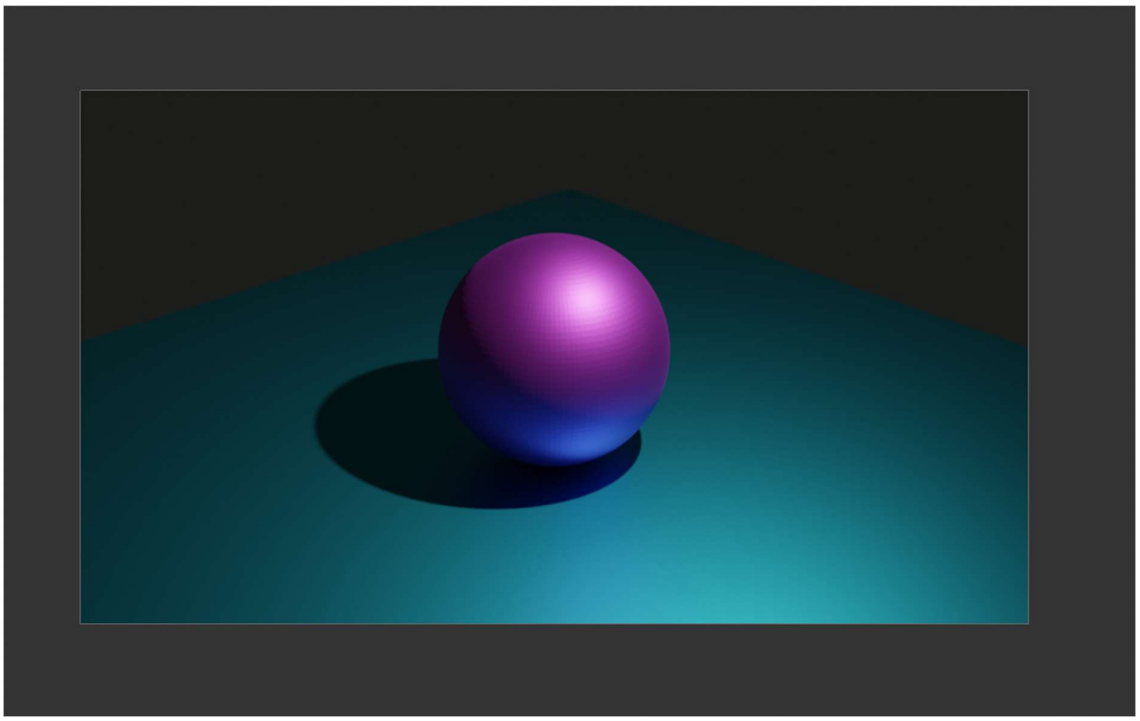


I used Principled BSDF. I used values of Metallic = 1.0 and Roughness = 0.5 for the sphere and Metallic = 1.0 and Roughness = 0.5 for the plane. The majority of the light hitting either

of the two objects will be reflected due to their high metallic values. Some light will be scattered since they have a 0.5 roughness value.



I used Principled BSDF. I used values of Metallic = 1.0 and Roughness = 1.0 for the sphere and Metallic = 1.0 and Roughness = 1.0 for the plane. The majority of the light hitting either of the two objects will be scattered since these surfaces have high roughness values.



I used Principled BSDF. I used values of Metallic = 1.0, Sheen = 1.0, and Roughness = 0.5 for the sphere and Metallic = 1.0, Sheen = 1.0, and Roughness = 0.5 for the plane. The majority, if not all, of the light hitting either of the two objects will be reflected. Since the sheen values are also high, and sheen has a very reflective property when interacting with light, most light will be reflected.