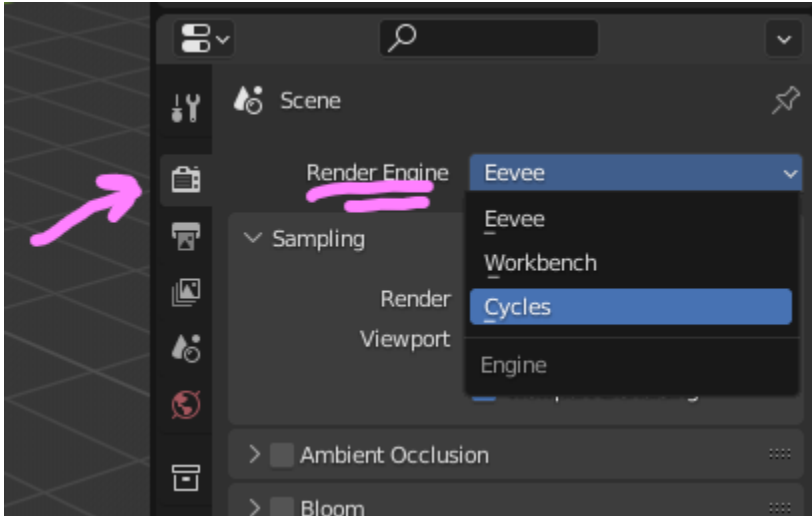


Rendering with Cycles

Cycles is the name of the rendering engine within Blender that uses a process called “ray tracing” to capture the 3dimensional scene as a realistic 2d image.

To switch your rendering engine within Blender, use the dropdown menu in the Render Properties tab

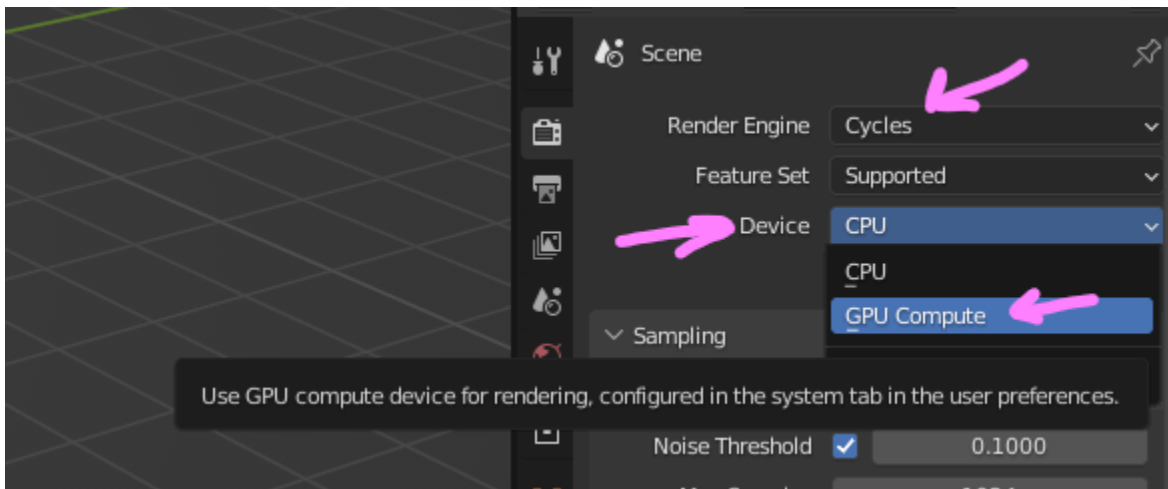


Some important points to remember when switching between rendering engines:

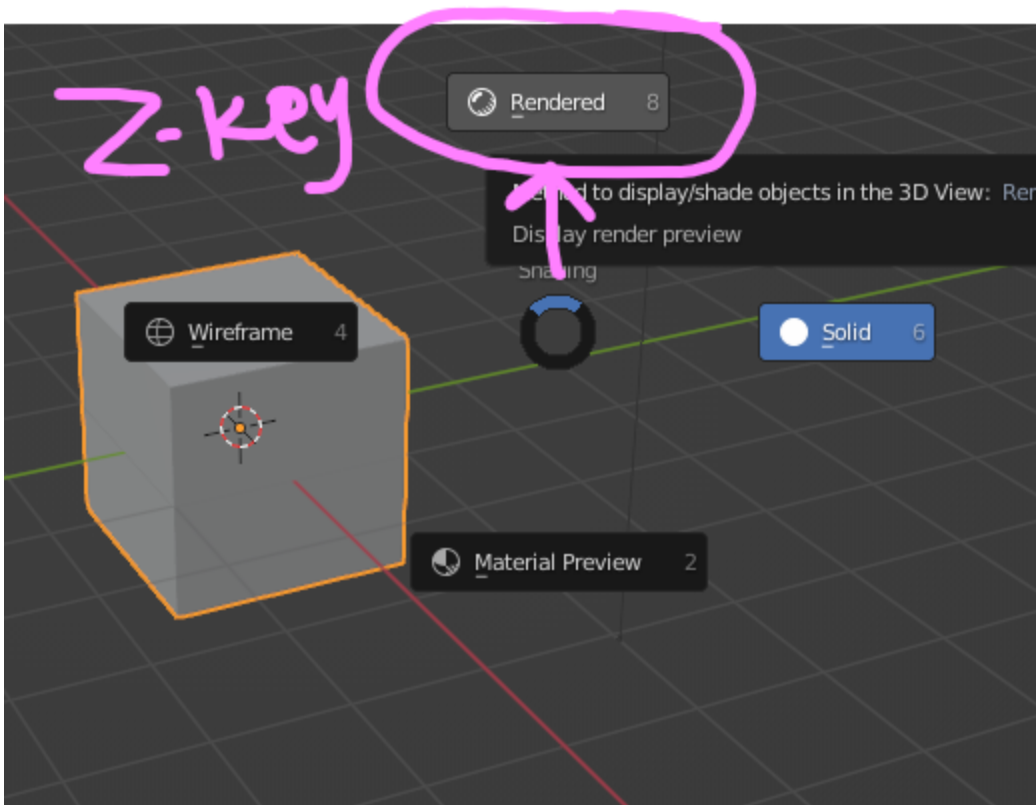
- Shader materials that work in one rendering mode may not work in the other rendering mode
- Eevee can handle real time graphics and renders quickly while Cycles takes longer but produced more realistic results
- Glass and reflection effects are not perfect in Eevee
- Cycles produces noisy images that require a filter to denoise them, sometimes causes artifacts
- Cycles rendering speed is hardware dependent. Better graphics card leads to faster rendering times

Find the setting to switch your rendering engine to cycles

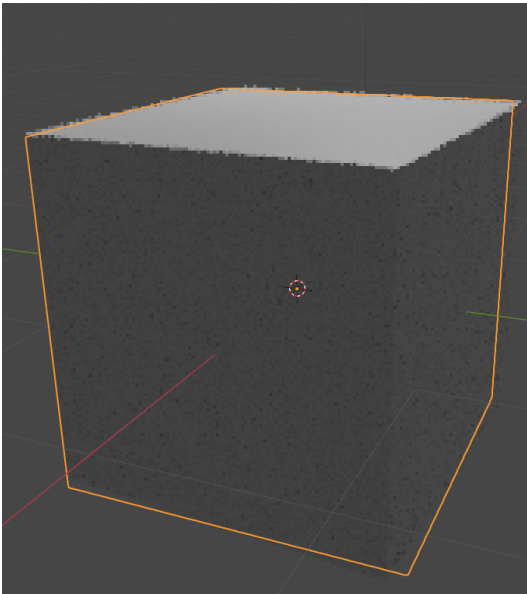
If your computer allows, switch the Device option to GPU Compute. This might help increase rendering speeds by utilizing your graphics card if available.



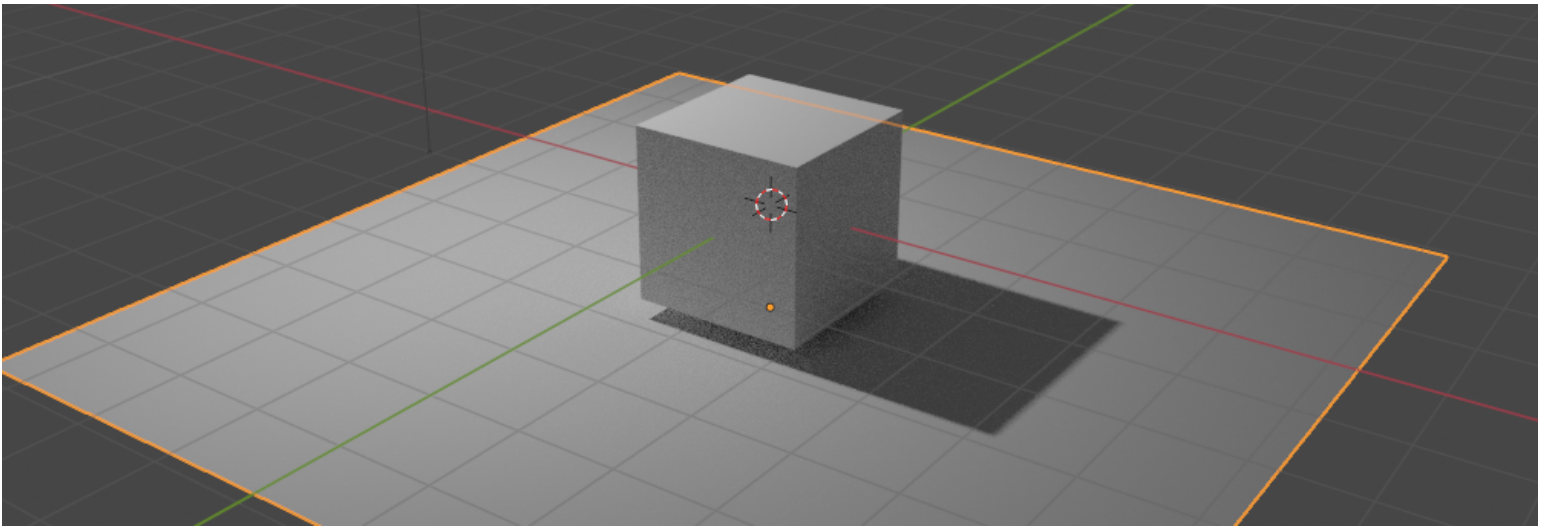
No look at your cube from the rendered view. Press Z and select the rendered option



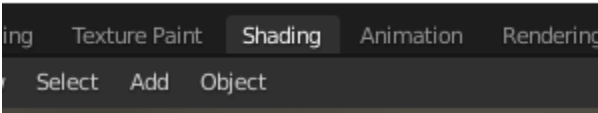
When you orbit around your scene, your cube will appear pixelated for just a moment until the rendering engine catches up. This is normal.



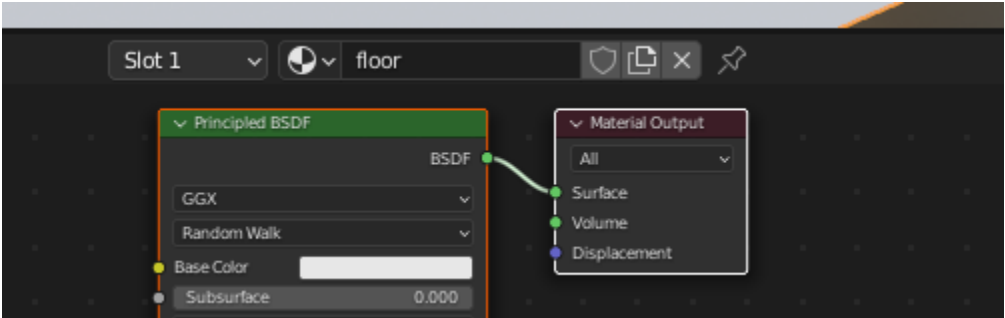
Add a plane to your scene and position it beneath the cube



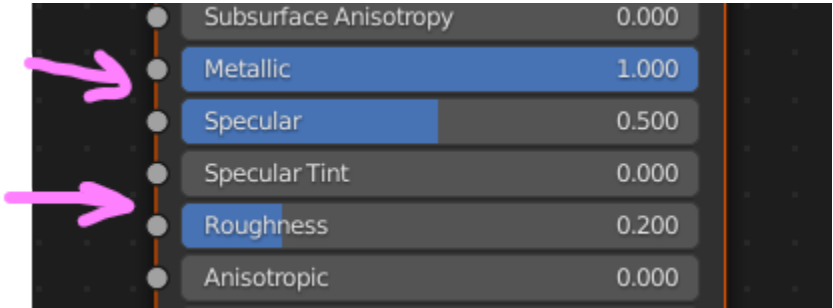
With your plane selected enter into the shader editor by clicking the tab at the top of the screen



Add a new material to the plane and rename it to “floor”



In the Principled BSDF shader, set the metallic property to the highest setting and the roughness property to 0.2

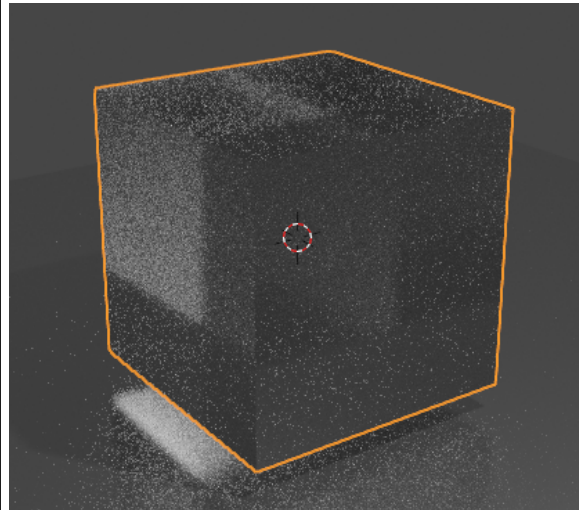
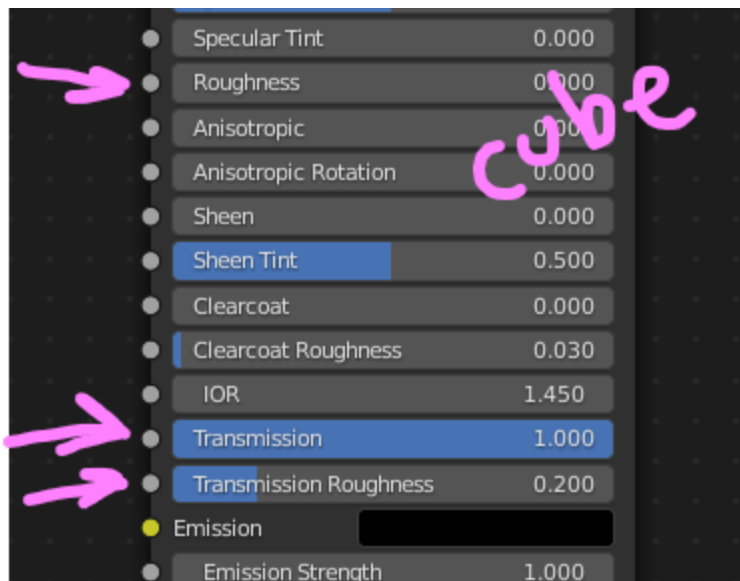


Next click the cube and change the material name to “cube”

For the cube material, set the roughness to 0.0

Then set the transmission value to 1.0

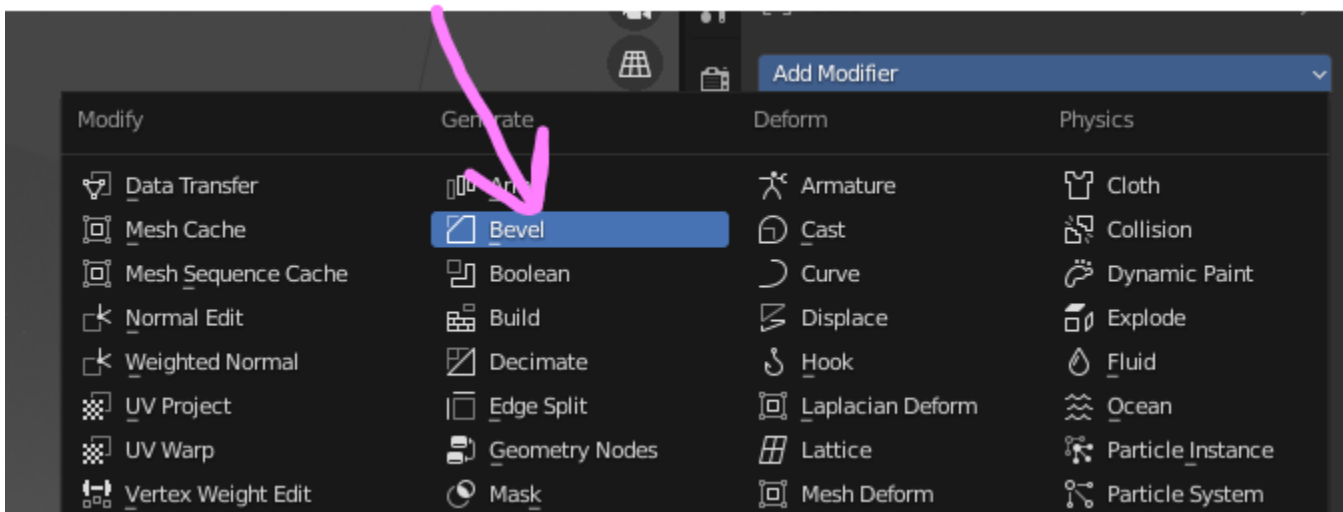
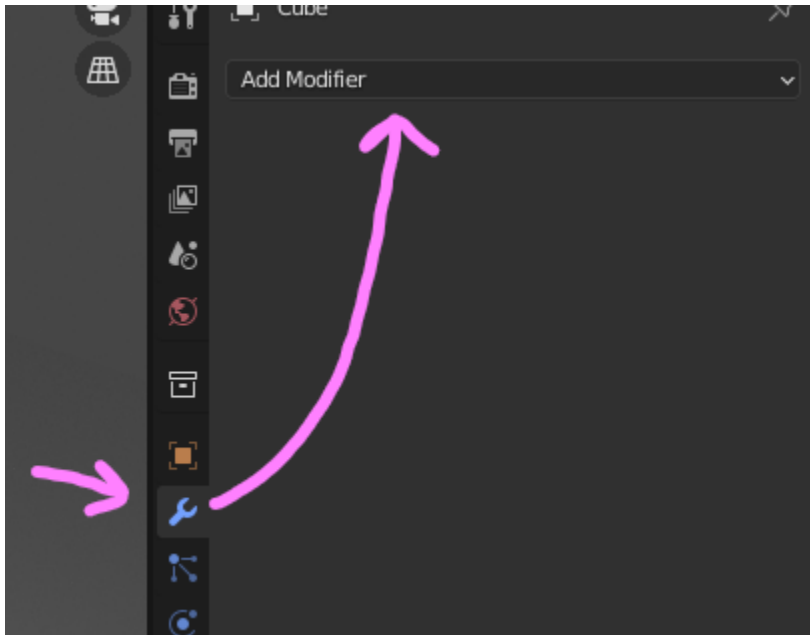
And set the transmission roughness to 0.2



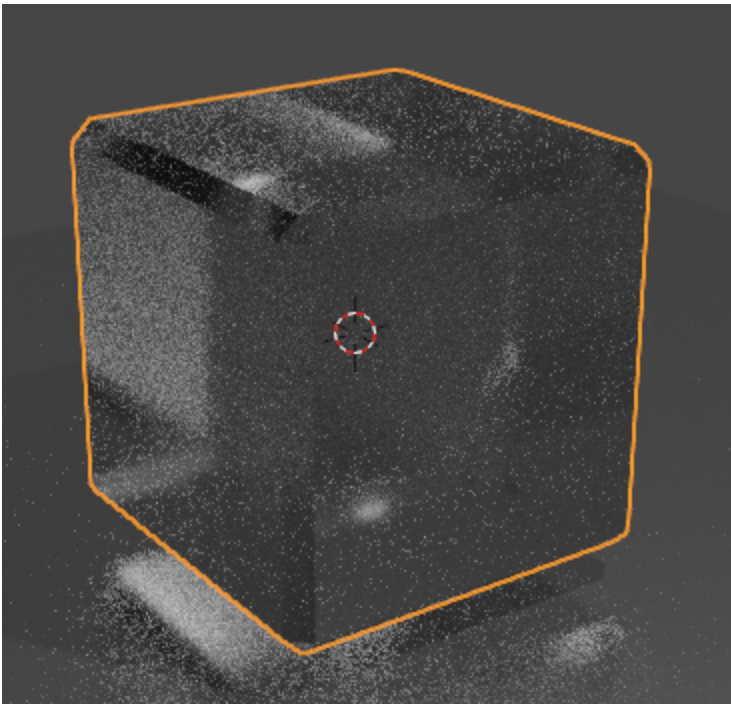
The cube now has a frosted glass like appearance.

Let's add a bevel modifier to the cube.

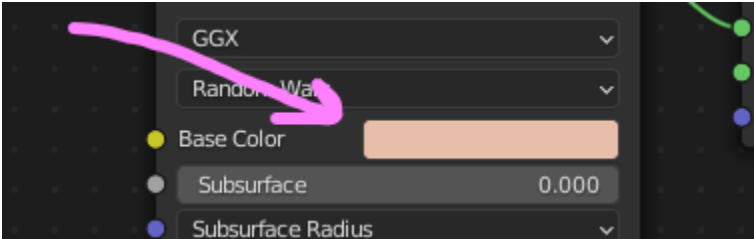
With the cube still selected, click the wrench tab in the properties panel and choose Bevel from the modifier dropdown menu.



The bevel is now visible on the cube

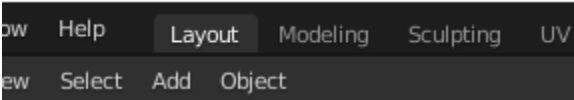


Let's change the color of the cube to a pinkish orange color



We are done with the cube now.

Return to the Layout viewport by clicking the tab at the top of the screen

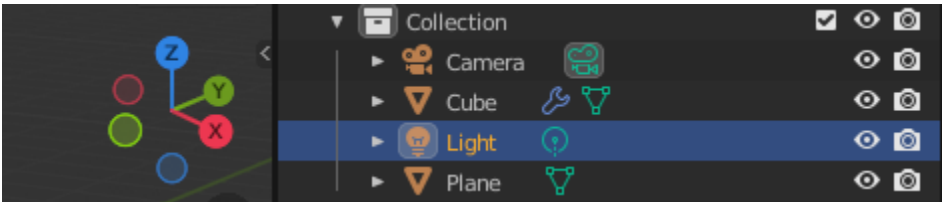


And click the camera icon to view the cube from the camera perspective



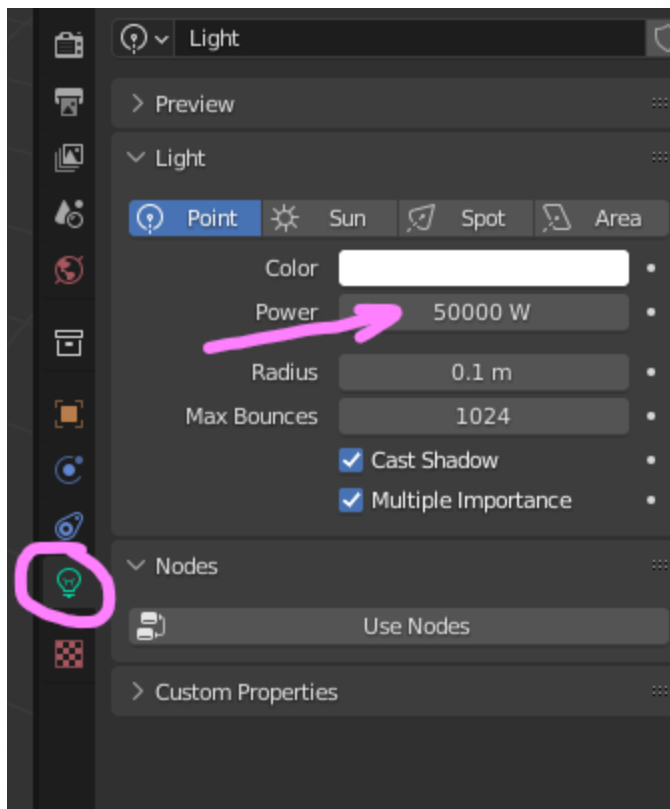
The lighting is a little bit dim, lets increase the brightness

Click the light icon in the hierarchy

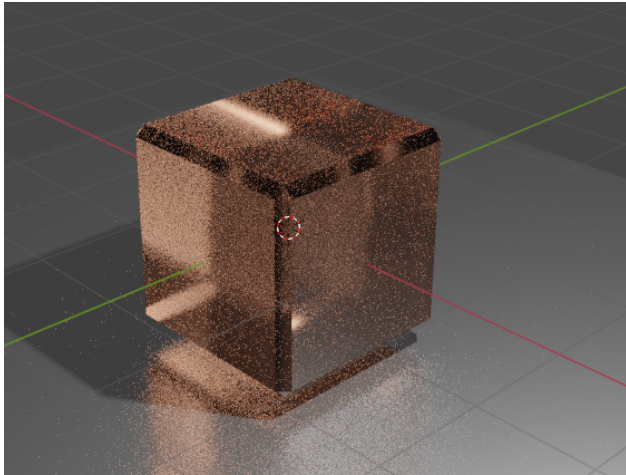


And select the lights property tab in the properties areas

Change the Power value to 50,000



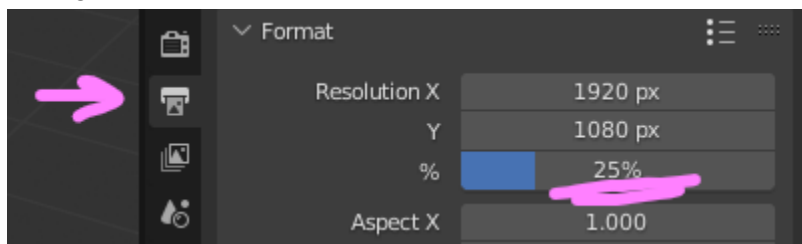
The scene looks much brighter now



Let's render this scene

Let's do a test render first

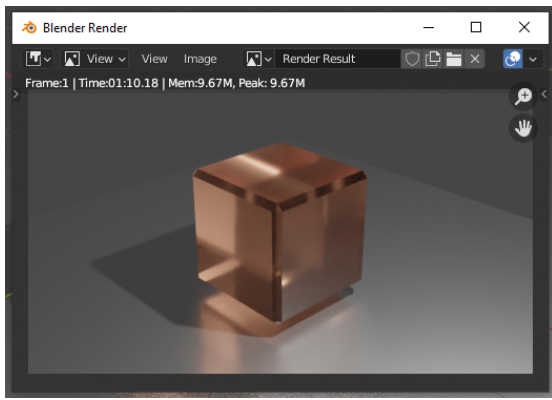
Set the value of the render resolution to 25%. This decreases the render size to 25% of the final size for speed and for testing.



Render the scene from the Render → Render Image menu, or press the **f12** key for the render image shortcut

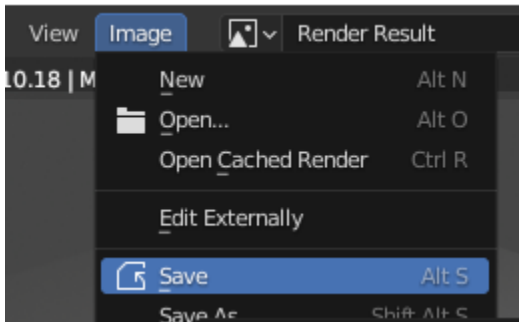
Now wait for the render to finish. It could take a few minutes. Do not use your computer while it is rendering

The popup window shows the render in progress and provides additional data about the render time.



Mine took 1:10:15 to render. That is 1 minute, 10 seconds, 15 milliseconds to render. Yours may have take longer or shorter depending on your computer hardware.

Save the test render image by clicking the image menu and selecting the save option. This option is only available in the render popup window or the rendering viewport.



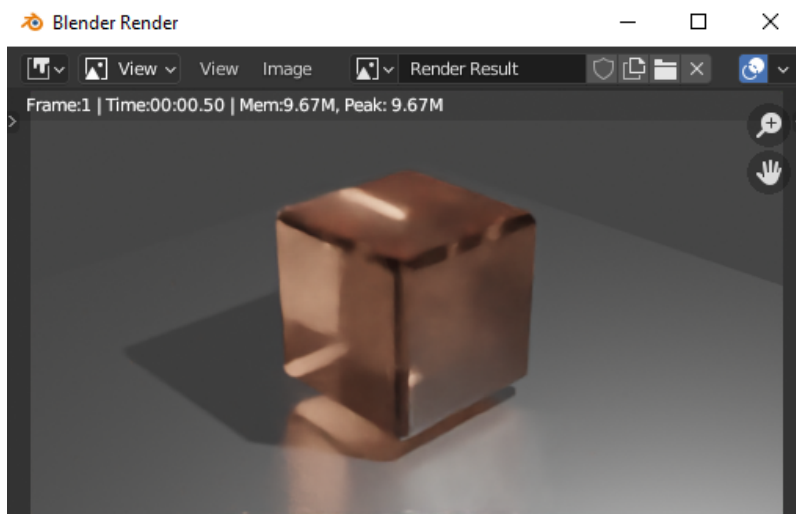
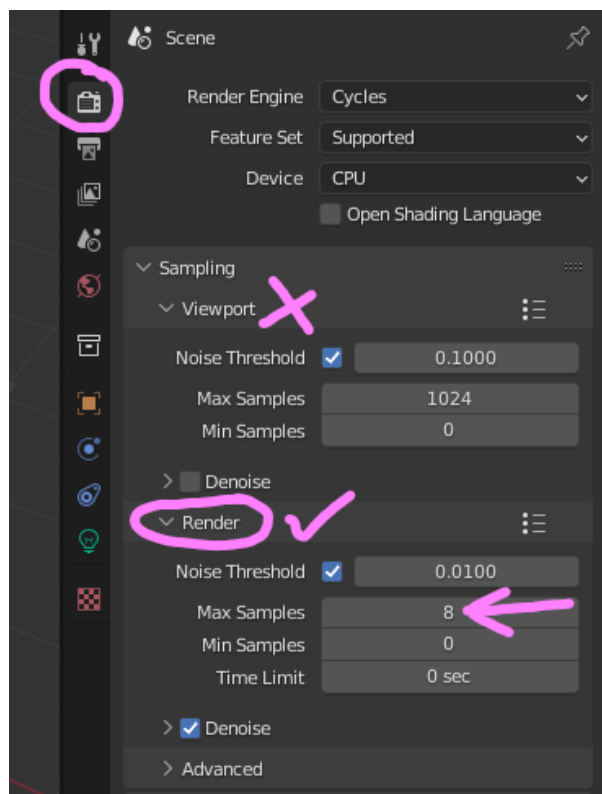
After saving press the escape key to close the popup

Now lets reduce the render sampling times to increase the speed of the render.

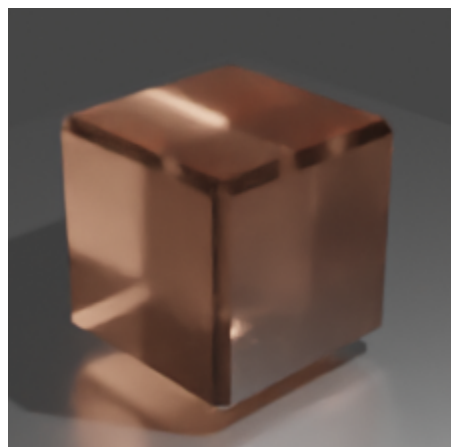
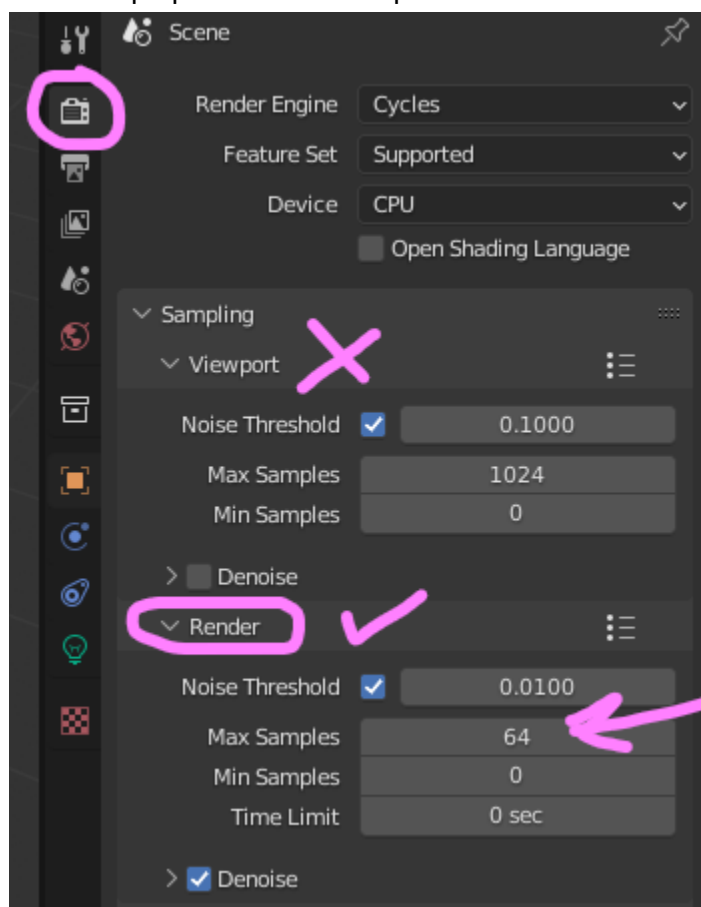
Things to keep in mind:

- The number of samples correlates with the quality and duration of the render. Higher samples result in higher quality renders but take longer time. Lower samples result in lower quality renders but take shorter time.
- There is an automatic denoiser filter applied to the render result. If turned off, then the final render will look noisy. If turned on, then the final render will look smooth, but can result in artifacts.

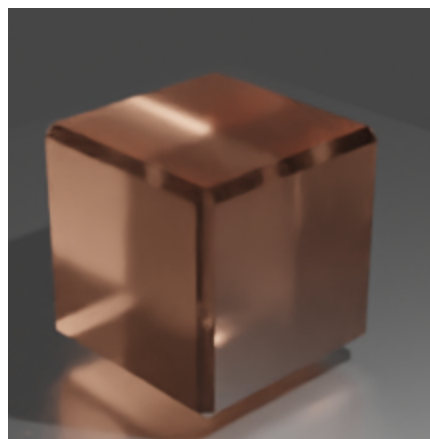
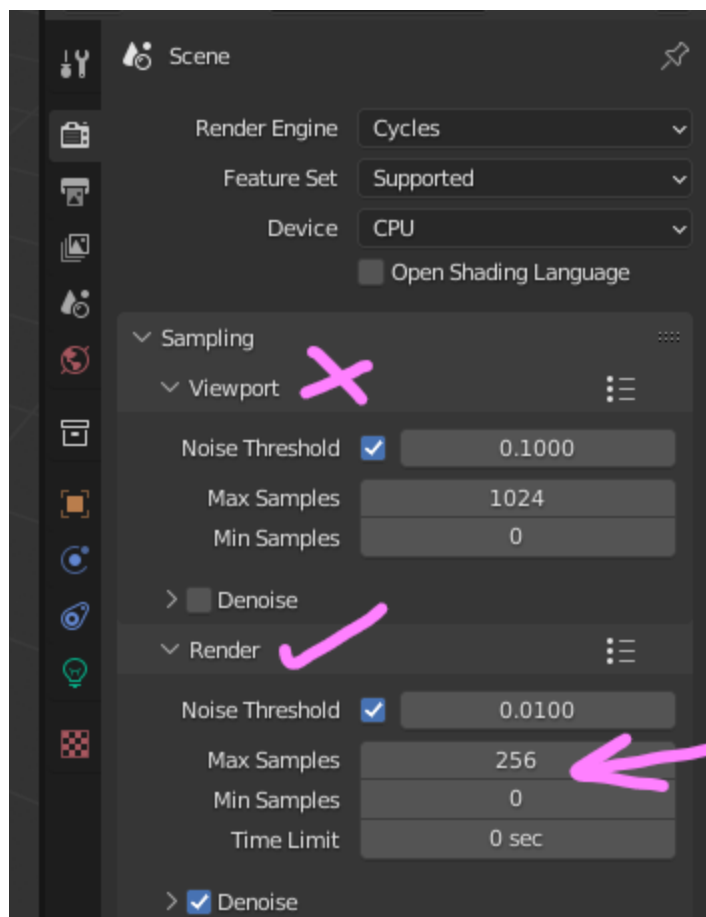
Let's lower the sample quality to 8 and re render the scene (render → render image)



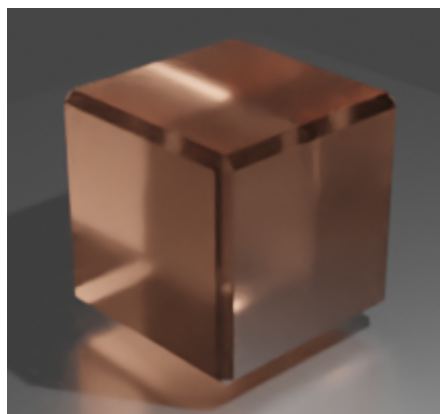
The results rendered quickly but the final result looks odd with artifacts. We do not need to save this image. Let's bump up the render samples to 64 and re render



The results are slightly better but there are still artifacts in the final result. Lets try a higher sample rate. Bump the render samples to 256 and re render

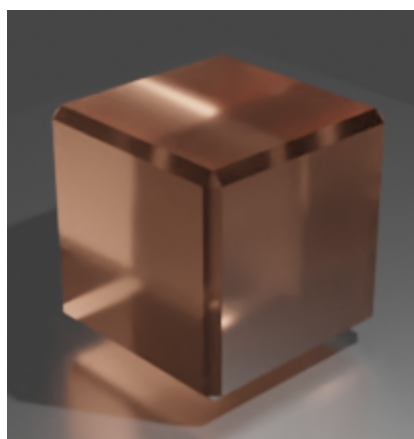


The results are again improved. Finally, set the render samples to 512 and re render
The results are now in a more acceptable range



512 samples

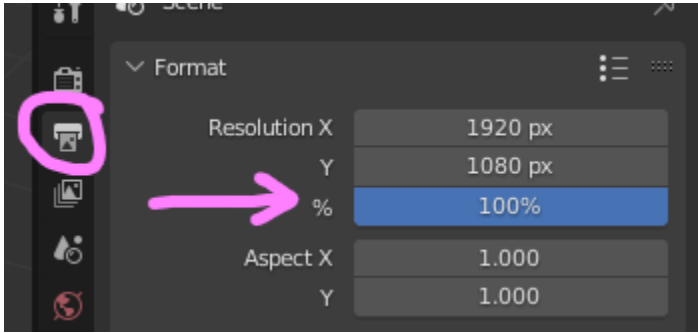
Compare the result of 512 above with the result of 4096 below. There are but a few improvements. 512 took less than 20 seconds to render while the 4098 took more than a minute to render



Finding the best render setting for a project is a product of complexity of the scene, computer hardware, and time allowable to render the image.

Finally, **keep the render samples at 512**, let's render a full size image.

Set the render percentage to 100%

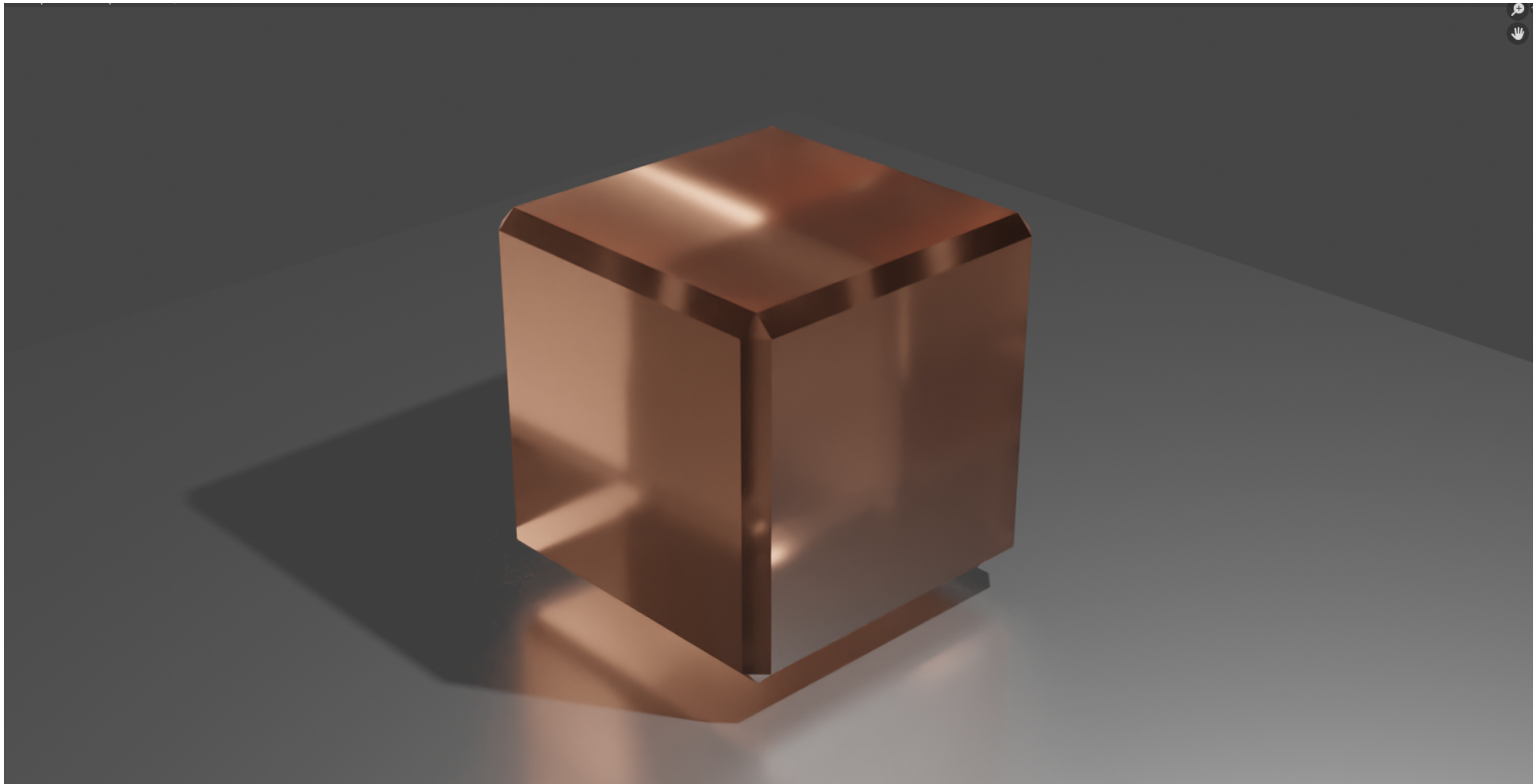


Render the image. This one might take a while longer maybe 5 to 10 minutes

You can see the rendering progress in the popup window. Do not use your computer or laptop while rendering. The resources are being consumed by the rendering process and everything will move very slow

To cancel the rendering process at any time, tap the escape key on your keyboard a few times

Here is the result of my render, which took 3 minutes:



Save the rendered image.

Your render is now complete.