

3D RENDER

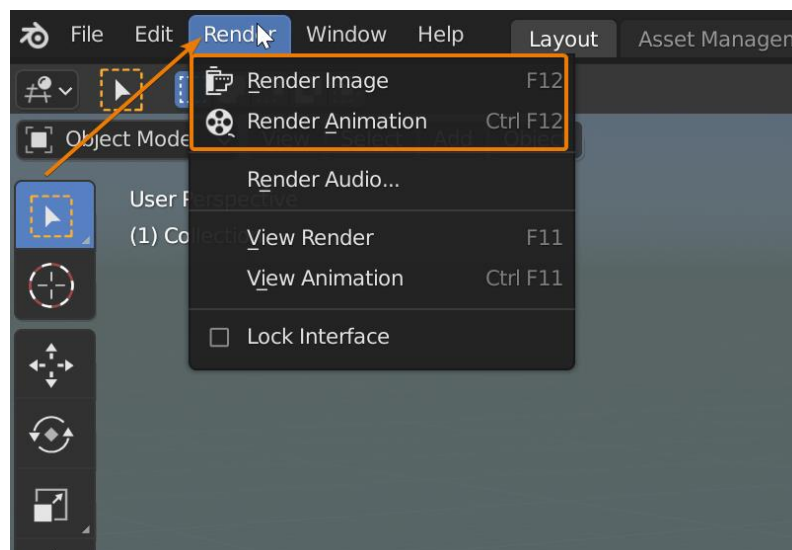
TUTORIAL

PAFSE: Partnerships for Science Education

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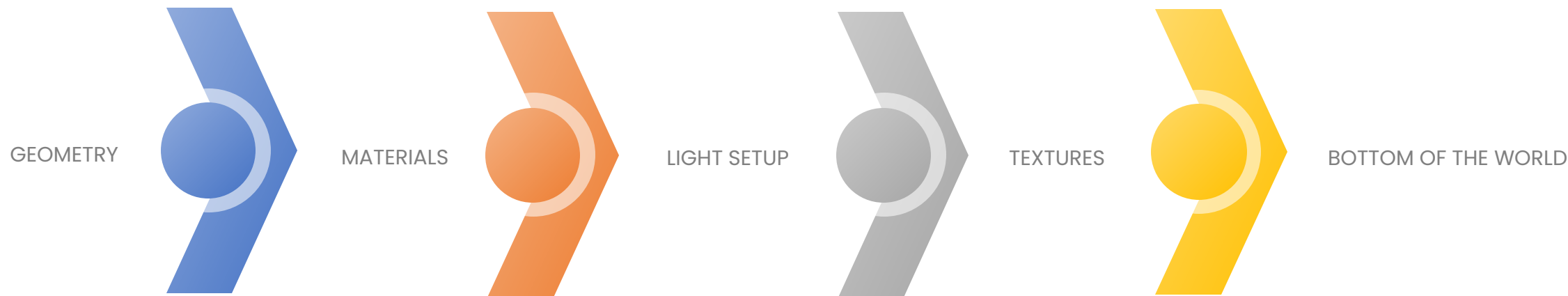
HOW TO RENDER IN BLENDER

- Rendering is at the heart of what we do in Blender. When you're starting out, it's good to understand how it works so that you can actually get some output to show and use.
- To render in Blender, press F12 to render a static image or Ctrl+F12 to render an animation. You can also go to the rendering menu and choose to render the image or render the animation from there.
- Of course, there's more to the story. In this lesson, we explore the fundamentals of rendering and what it involves. I'll also direct you to additional resources that are good to follow as you learn more about rendering.



WHAT IS RENDERING?

- Rendering is when the computer calculates the light in our scene to create the final image or animation. To calculate the lighting, the rendering engine needs information from our scene. This includes things like:

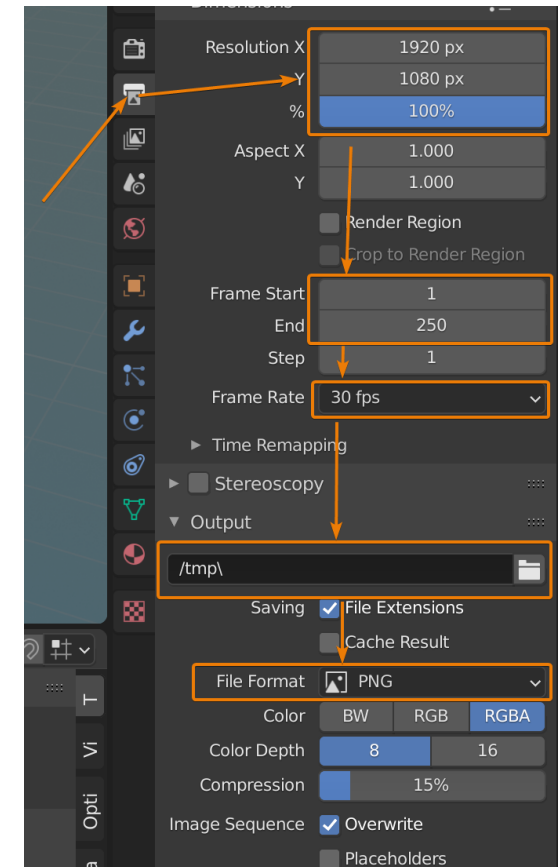


RENDERING ENGINES

- Blender has two built-in rendering engines: Eevee and Cycles. These two rendering engines are meant to be similar in appearance, but they work completely differently.
- Eevee is a raster rendering engine, which means that its main goal is to be fast. This type of rendering engine is suitable for real-time or near real-time performance.
- Cycles, on the other hand, is a ray tracing rendering engine. This is a much slower type of rendering engine. The benefit is that it is much more accurate and produces an image based on how light is reflected in the real world.
- It is possible to produce a good-looking image with both mechanisms, but they follow very different paths to the resulting image.

HOW TO RENDER AN ANIMATION IN BLENDER

- To render an animation in Blender, press Ctrl+F12 or go to the render menu and press render animation.
- With animations, we need to prepare a few things before we start rendering. First, Blender needs an output folder to store the rendered frames.
- We can define this folder in the output section found in the output properties tab just below the render settings. Here we can choose an output folder as well as a file format.
- By default, the output folder is /tmp/. This is equivalent to C:\tmp in Windows.
- Next, we need to choose a file format. We can choose an image format, for example PNG. In this case, Blender stores each frame as its own image file and, if an error occurs during the rendering process, we can render from the last successful frame instead of re-rendering the entire animation.
- We can also choose a movie format such as FFMPEG Video. In this case, Blender will render each frame directly into a movie file, but we won't be able to resume rendering if an error occurs in the middle of rendering.
- In the dimensions section found in the output properties, we can also define the resolution and frame settings.



HOW TO RENDER AN ANIMATION IN BLENDER

- When rendering an animation, the image editor will appear and show us the progress, one frame at a time, until all the frames have been rendered.
- A simple way to get started with animation in Blender is to animate the movement of the camera in your scene, but we'll talk about that later.