# Applying Forces in 3D

A blue text on a black background

Description automatically generatedApplying forces in 3D is pretty much the same as it is in 2D, but now there’s a third dimension. Here is the code that makes the ball go up. Instead of using a Vector2, I use a Vector3, which lets me apply force to the ball’s **z** dimension and that dimension only. Now, when I click the space bar, my ball goes up!

# A screenshot of a computer Description automatically generatedHow to change to look of meshes

To change the look of meshes, there needs to be a mesh shape applied to the mesh instance. In this case, I used a cube. Next, in the inspector, under Surface Material Override, a new materiel needs to be applied. Once that new material is created, a BUNCH of things can be edited. For this game, all I changed was the albedo, which is the color of the mesh.

# The different types of physics bodies in 3D

Just like in 2D, there are several different types of physics bodies in 3D. In this pinball game, we used StaticBody3D and RigidBody3D. The different bodies are essentially the same as their 2D counterparts, just with a third dimension.

# Thinking of 3D forces compared to 2D forces

This was actually something that I had to think about a bit before I understood it. Obviously, you can’t just move something up and down in 3D and expect it to feel good to the player. In this pinball game, for example, the table is slanted. This means that just moving the ball on one axis will not be correct because it won’t come back down in the right spot. If I just moved the ball on the y-axis, it would come off the table, that’s not how pinball works. Instead what I did was move it on the z-axis, that way it’s sort of fighting against the table. The ball is staying flat on the table, but since it’s slanted it’s able to move up and down it.

# Importance of lights and cameras in 3D spaces

Without a light, the 3D scene would be pitch black. Without a camera, there would be no way to see the pitch blackness. Unlike in 2D, where we can see whatever is in the viewport whether there’s a camera or not, 3D requires these assets to be put in manually. The having control over the lights also allows for tighter control over experience. If you want the game to be creepy, turn the lights down, if you want it to be happy, make them a bright color, etc.