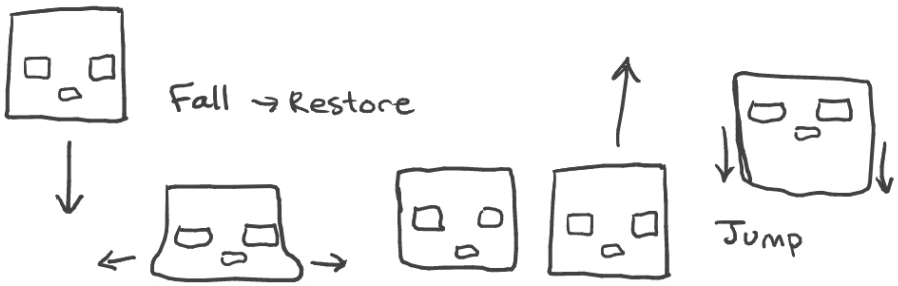
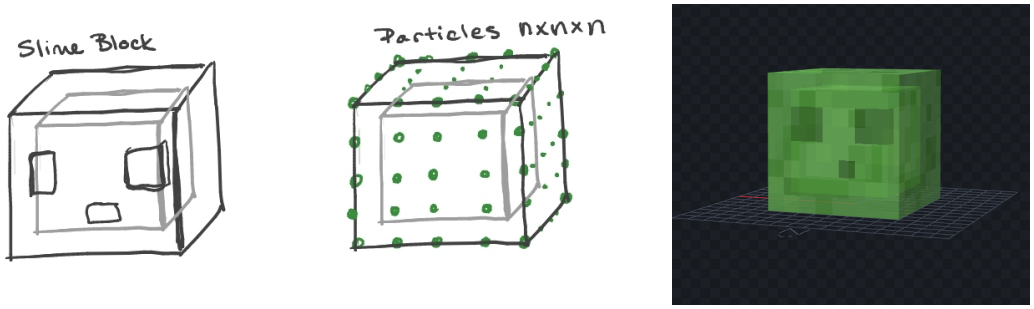
Minecraft Slime Block - Mass Spring Simulation - Rebecca McFadden

The general idea for this project is to create an `n x n x n` cube of particles connected by springs to simulate a jello-like substance. I plan to start with the Assignment 5 starter code and re-do the cloth to be a cube of particles - rendering only the outer facing vertices. Particles in the cube will be connected with structural, shear, and bending springs (just more than with the cloth).

I have a few ideas for expanding on this idea for increased interactivity. The first is to introduce an upward force on particles at the bottom of the cube when the spacebar is pressed to make the slime "jump". The second would be to spawn a sphere or other object to collide with the slime on a different key press.



The third idea aims to more closely resemble what the slime is meant to be. Slimes have an outer layer that is more transparent and less rigid than the inner more opaque layer. I believe I can go about this one of two ways depicted below.



The first would be to use a slime block mesh and approximate the vertex positions based on their original distances to each of the nearest particles in the cube. The slime block mesh could then be rendered with the appropriate texture and alpha map to make the outer layer transparent and the inner layer opaque. The second option is to carve an `m x m x m` cube from the inside of the original cube and add these particles as vertices of a second "mesh" with the same outward facing normals. I could then use two separate textures and corresponding alpha values to render the "two" meshes. The downside with this approach is that I would lose the additional cubes that make up the eyes and face of the slime, but it may be more feasible than the first option.