Criterion C: Development

1. Camera movement
2. Display HUD and spheres
3. Animate Spheres
4. Get intermolecular forces of all combinations
5. Touch up GUI with textures and better display

1. I initially visualized my project as a 3D model that would make the camera pivot over a center and rotate along the circumference of a sphere. I was originally going to use the camera object that is built into processing and code it to move based on the x and y movements of my mouse. This turned out to be very difficult as to rotate the camera would also need to use the z-axis and it was very lag prone with the increments that I needed to translate the camera by. Instead, I used a library that was provided by Processing called Peasy Cam by Jonathan Feinberg. This helped me immensely as the calculations and the increments were already in place making the camera movement very smooth. It also provided me with more methods for the camera such as zooming in and HUD.
2. In the program, when you move the camera, the text and the buttons have to stay in place. Luckily, in the library there was a method that controlled when the heads up display (HUD) was active. This allowed me to easily implement buttons and text boxes. I also needed to control a drag and drop system for the spheres. I did this by creating an Array List for each molecule. I would detect mouse events such as clicking and dragging and then I would add the molecule to the screen when it was released.
3. In order for the dragged and dropped molecules to move towards each other, I first had to find out the polarity of each molecule and where the slight charges were. This was to first locate the area that each molecule would realistically attract to. After I finished my research and got all the locations, I placed 2 PVectors, one at the target and the other at the current location. I then used trigonometry to locate the angles between the two points and used the angle to determine the increments for the molecules to move toward each other. Then I implemented collision so it would stop at the target.
4. I researched how intermolecular forces formed and why each one is formed. I then

researched each molecule and their forces. I then found all the combinations and made more text boxes to display more information.

5. To fix the start screen, I first added more information on how to play and what my project is about. I also added a button that clears everything from the screen so the user doesn't need to relaunch the application. To make the new textures, I used PImage and the setTexture method to first create my own shape and then using a pixel art program, I modified pictures to fit my shapes better. This allowed seamless texturing of my shapes with info on them.