Criterion A: Planning

Defining the Problem

The client (Mr. Gunderson) wants to create a model of intermolecular forces to show his students to help them understand what the interactions look like in molecules. Intermolecular forces are the forces that appear between molecules such as H2O and NH3. These forces can be hard to visualize and really understand why certain forces appear over another force. The easiest way to solve this is through the use of a 3-D model accompanied text that explains it.

This project will be able to display certain molecules in 3-D and then animate them to move toward each other to simulate the intermolecular forces. You will also be able to rotate the camera and zoom in to get a better look at the molecules in space.

Rationale for the Proposed Solution

He would like a project that he can run on his computer in order to demonstrate it to his class on the projector screen. This is because he can add on to the molecule's descriptions and have a large model to display.

By coding this software, the developer (myself) will also be able to refresh and reinforce their knowledge of intermolecular forces and molecular structures. There are some models available online, but they only have 1 combination of molecules, are not animated or are only in 2-D. My model will combine the features of them to make a better version as well as explain the forces in the UI of the application.

This will be coded in Java and in Processing as Java aligns with the AP coursework and Processing has a good UI and graphics orientation.

Success Criteria (in order of importance)

1. Application can display a molecule on the screen that has the correct proportions
2. Application can display all 4 molecules on the screen with a drag and drop
3. Application can rotate the camera and zoom in and out
4. Application can animate 2 molecules to the correct location
5. Application can describe the bond that was formed between any 2 combinations of the molecules

6.