GNG 1103 F: Deliverable D (Design Criteria)

Name	Student Number
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Thomas Boyd	300117763
Pion Das	300124924
Marie Daoust	300052381

Settings  (Marie Daoust,300052381)

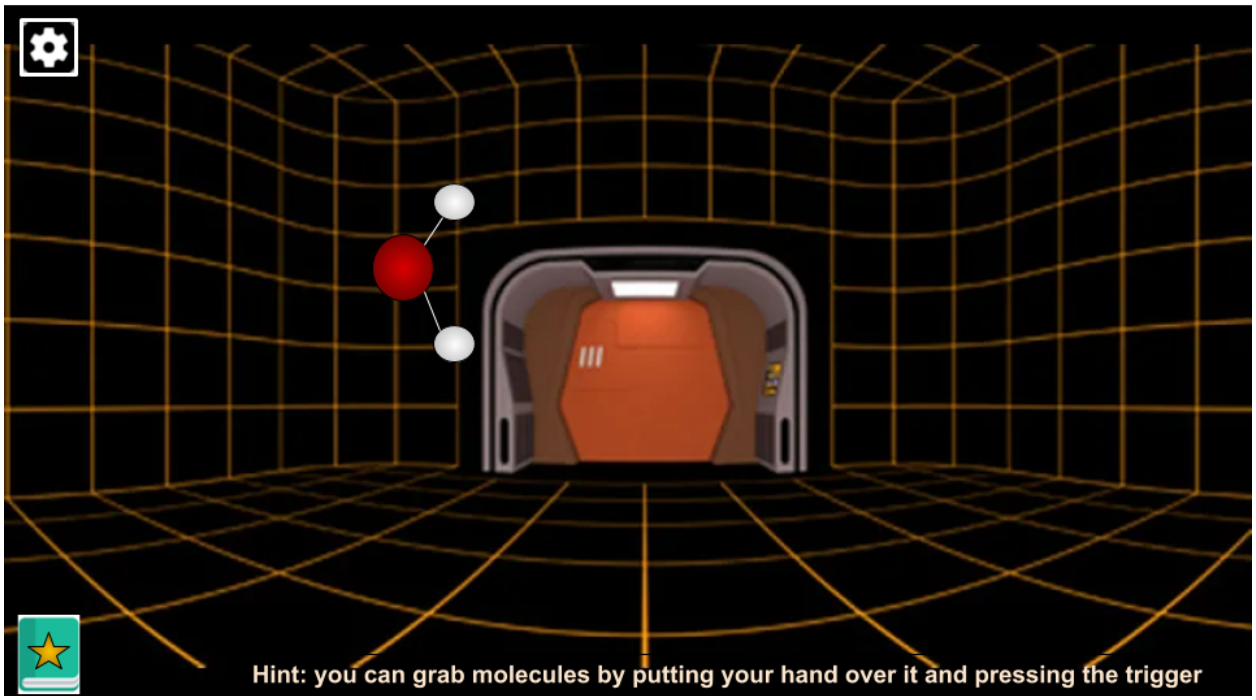
Changes the parameters of the game, such as volume, brightness and different representations for showing the molecules. This icon will be situated at the top left corner of the player's view and will remain small enough not to get in the way of the player.

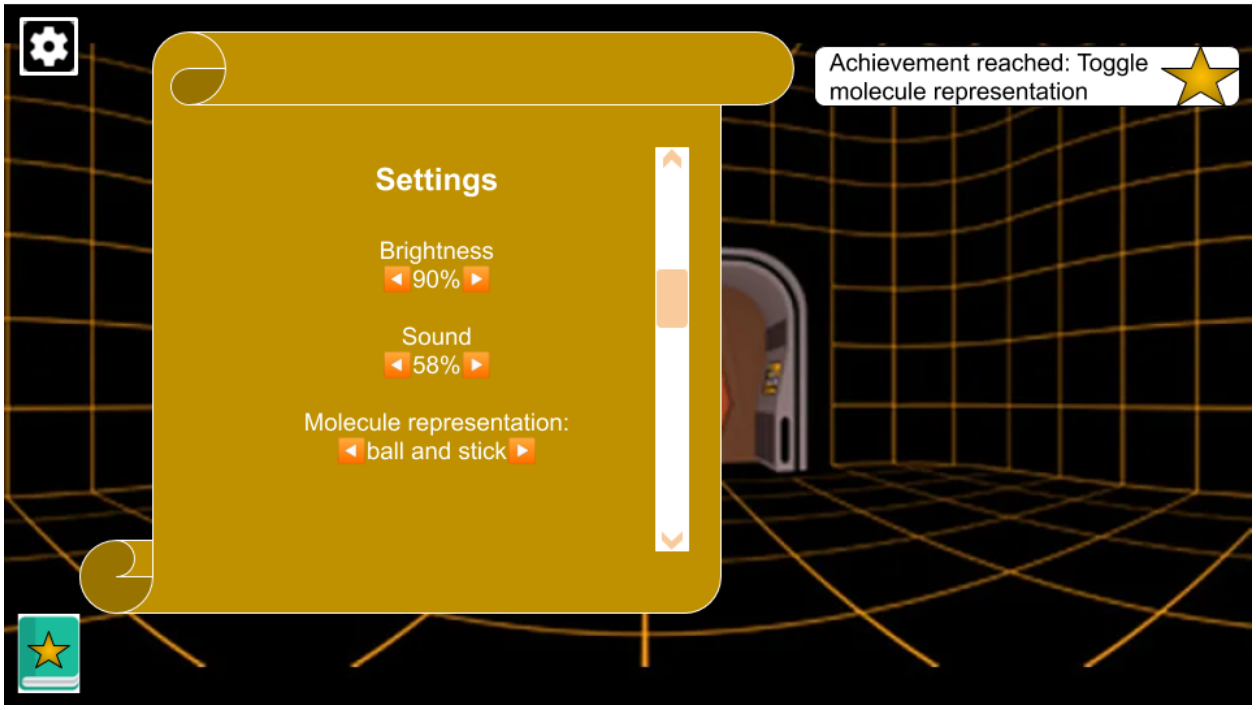
Achievement book 

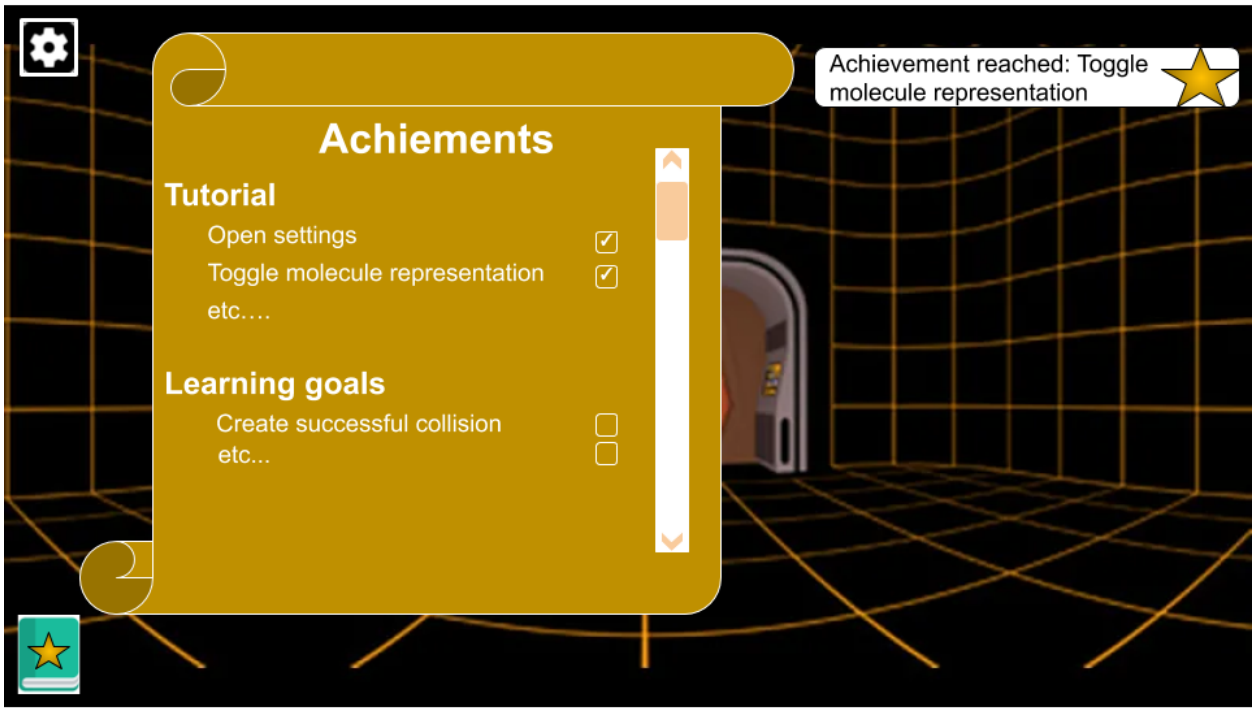
Gives step by step instructions on how to finish the tutorial and what learning goals should be achieved while playing the game. This icon will be situated at the bottom left corner of the player's view and will remain small enough not to get in the way of the player.

Until the tutorial has been completed, hints will show up on the bottom of the player's view, guiding them towards the different tasks to accomplish for the tutorial.)

Note that these images are simply to demonstrate concept design, and the visuals are subject to change.


Hint: you can grab molecules by putting your hand over it and pressing the trigger


Achievement reached: Toggle molecule representation
Settings
Brightness
90%
Sound
58%
Molecule representation:
ball and stick

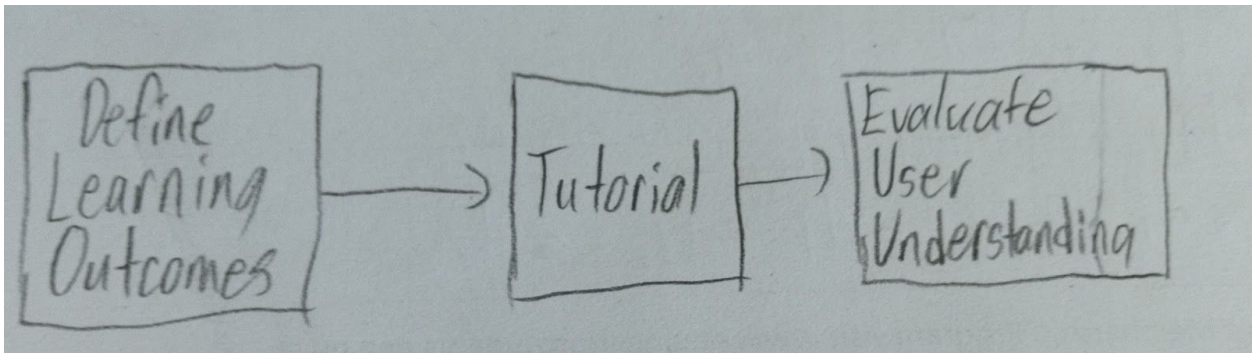

Achievement reached: Toggle molecule representation
Achiements
Tutorial
Open settings
Toggle molecule representation
etc….
Learning goals
Create successful collision
etc...

Organic Chemistry Reactions (Patrick Huang, 300097191)

In the VR simulation, there will be 2 reactions: one for the tutorial, and one for the evaluation. Both reactions will follow the following colour convention:

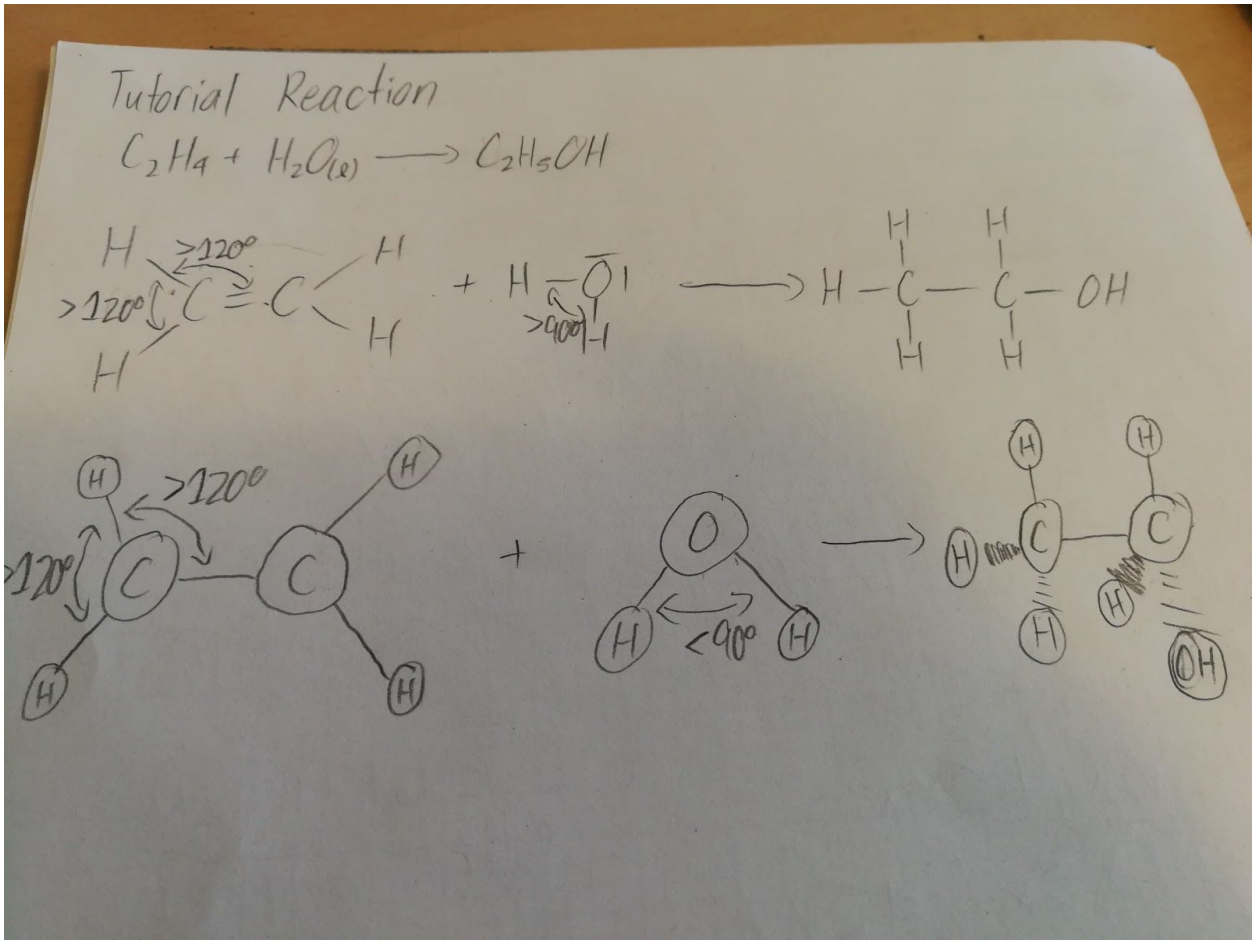
Element	Colour
Oxygen	Red
Nitrogen	Blue
Carbon	Grey/Black
Hydrogen	White

Also, the game will progress like so:



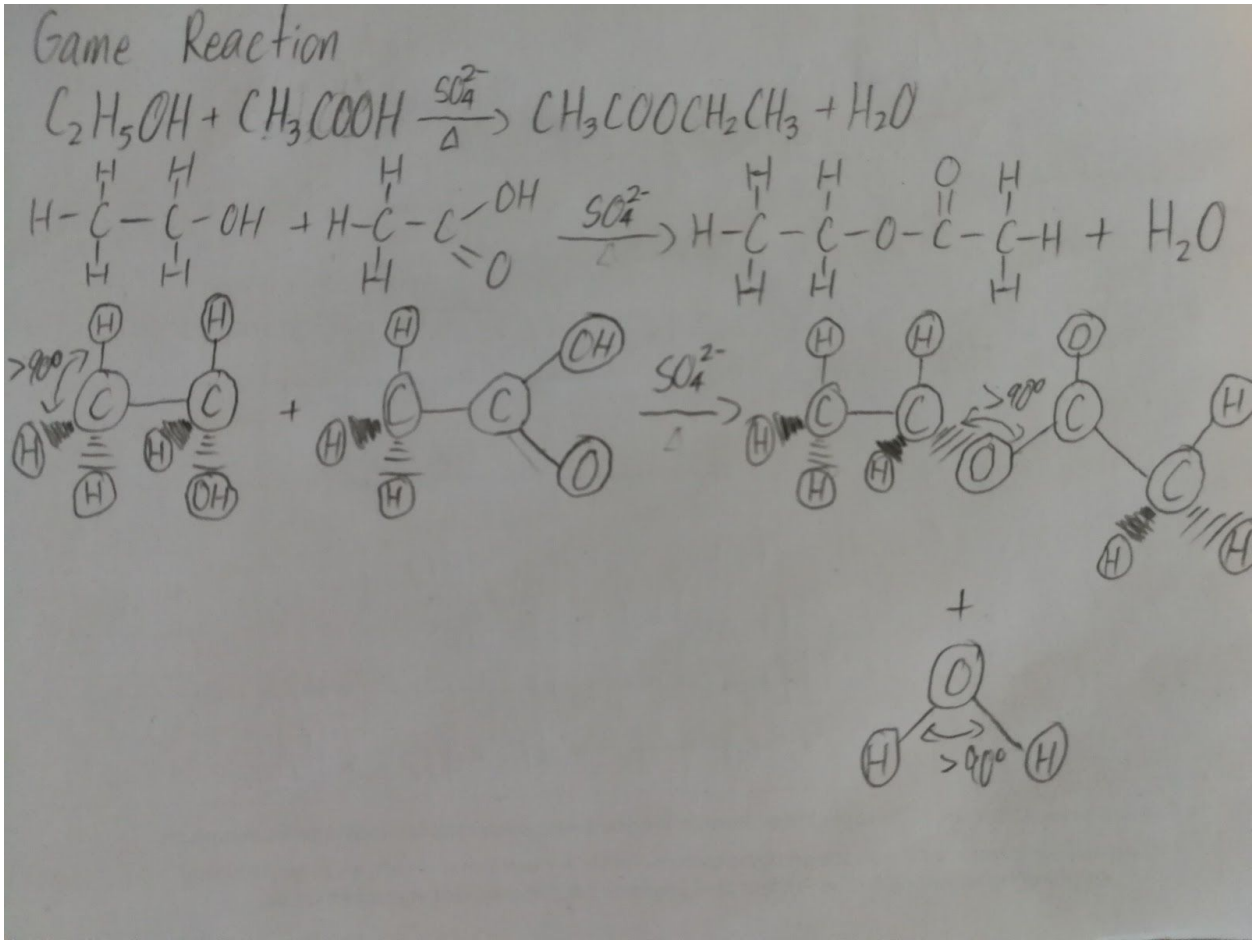
Tutorial Reaction:

The first reaction will be a sample reaction, that is meant to help the user adjust to the environment, and prepare him/her for the next reaction. The reactants of the reaction are ethene and water, undergoing hydrolysis. Ethene is a gaseous alkene, that can react with water to create an alcohol, which is ethanol. There is no need for a catalyst in this reaction. The presence of ethanol can be tested by the presence of a blue flame.



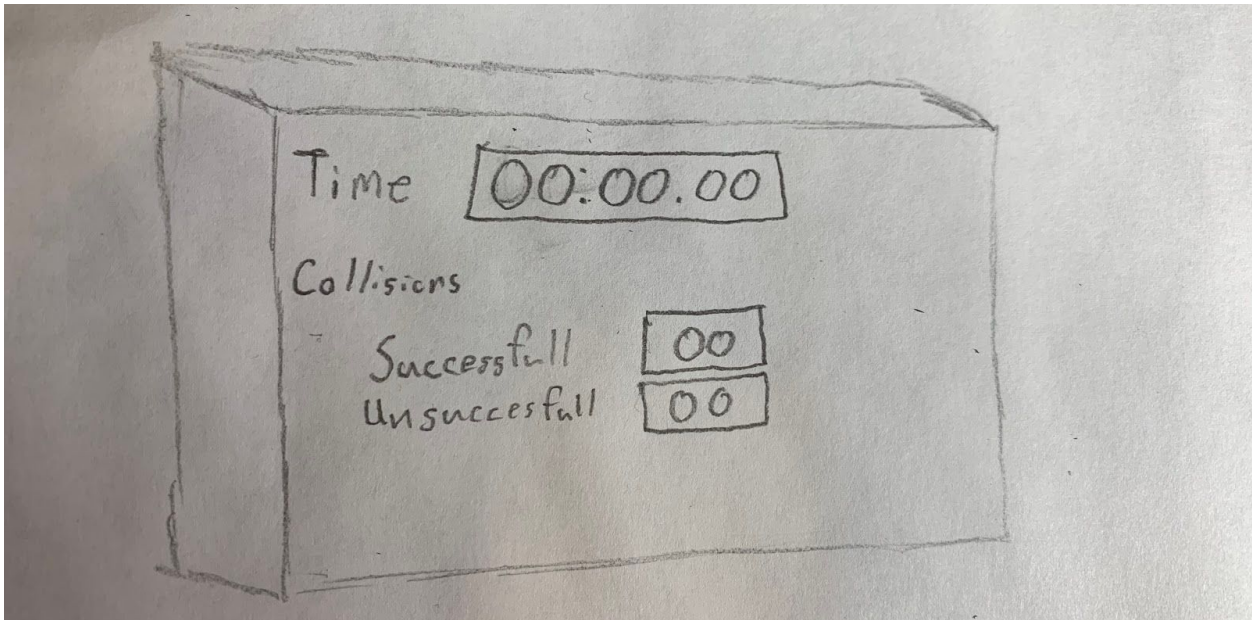
Evaluation Reaction:

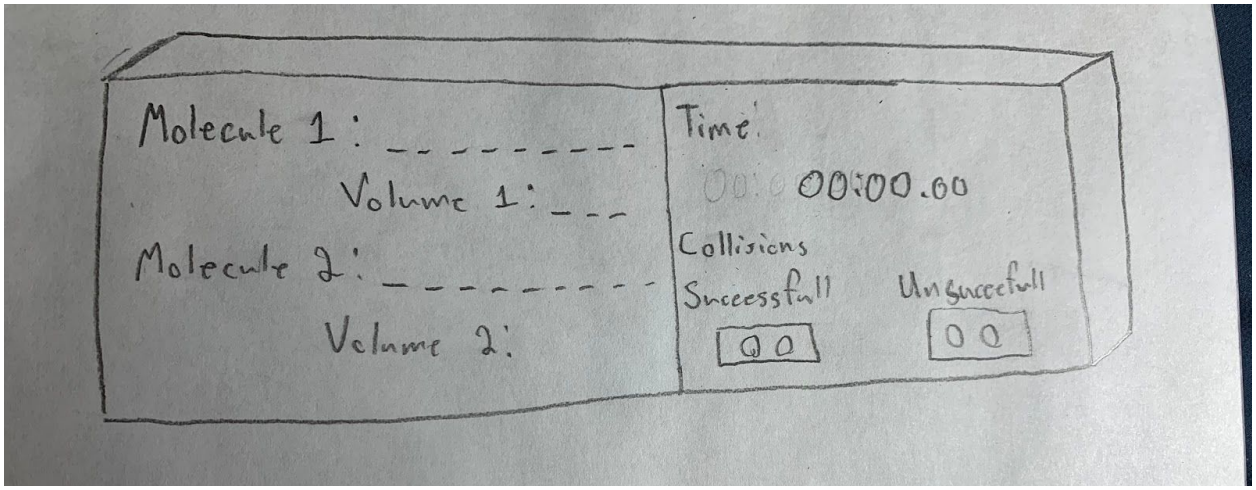
The second reaction will be a test of knowledge, as well as an instructive and interactive way of exploring a specific organic chemistry reaction. The reactants consist of ethanol, which was the product of the tutorial reaction, and ethanoic acid, also known as vinegar or acetic acid. In this particular reaction, the molecules will not collide very efficiently without the presence of a catalyst. Sulfuric acid will be required to follow through with the reaction. However, the presence of heat will prevent the reaction from occuring.



Data Board: (Thomas Boyd, 300117763)

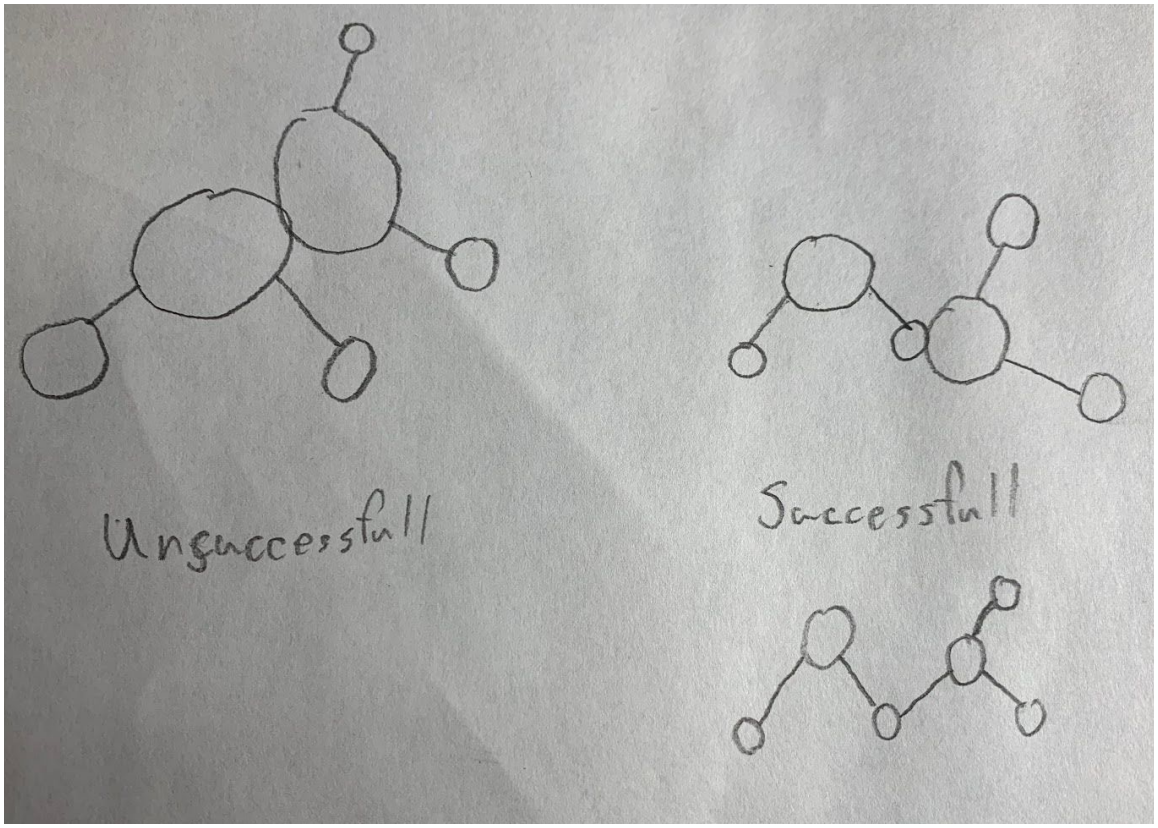
The purpose of the data board is to show how long the reaction takes along with showing how many molecules collide with each other and how many of those collisions are successful. In addition, the board may also show what substances are being used and their respective volumes.





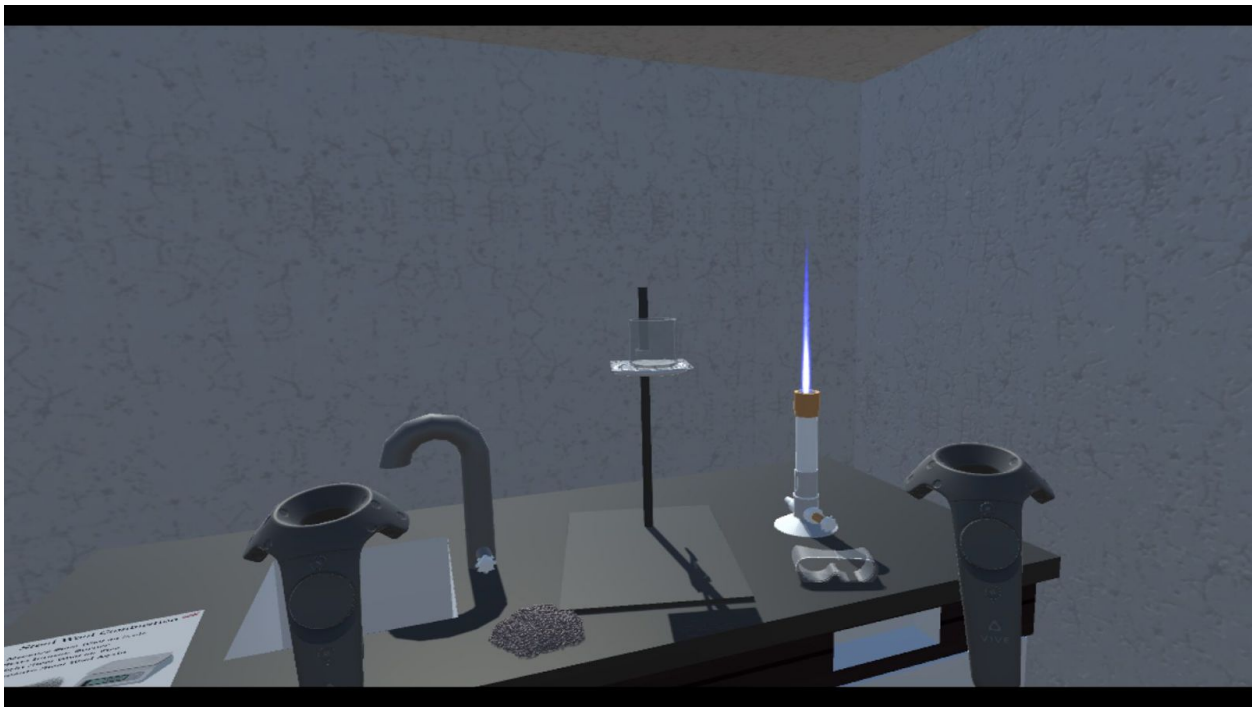
Molecule Collisions:

Molecules collide during the reaction where there is a chance that they will bond together making a successful collision or bounce off each other and being unsuccessful. When the collisions are successful the two molecules will bond together forming a new molecule.


Unsuccessfull
Successfull

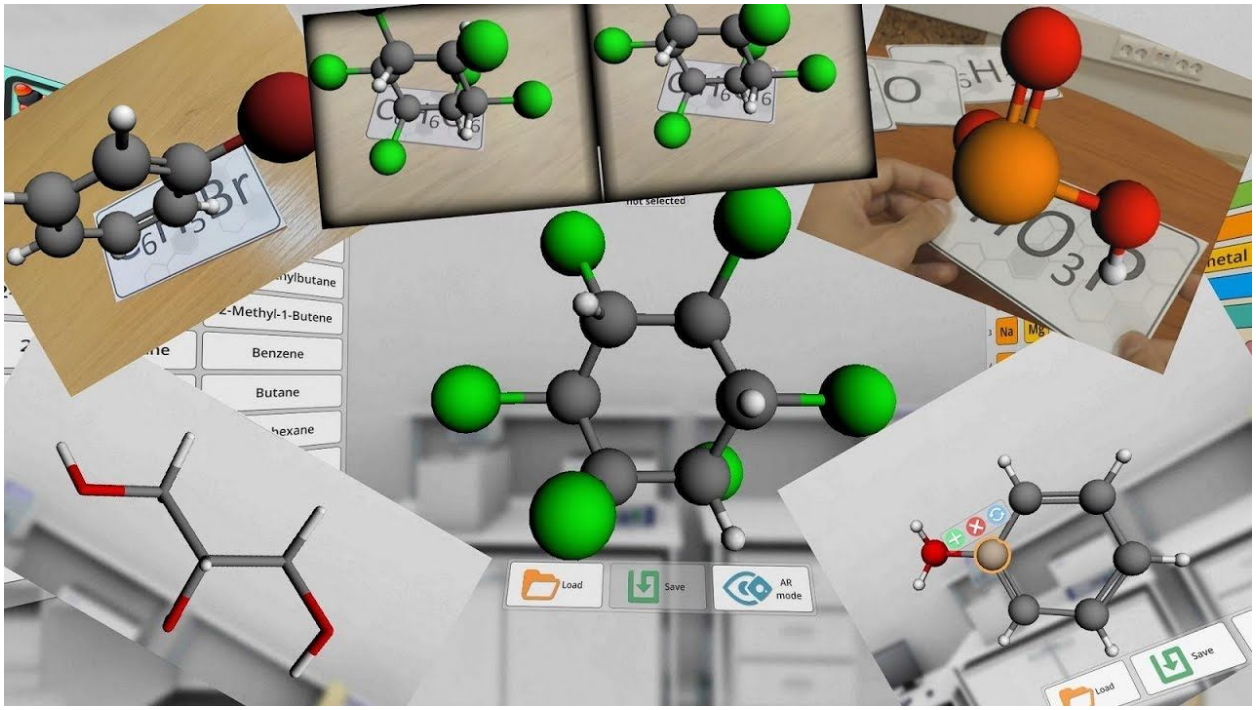
Environment: Pion Das (300124924)

The environment will consist of the lab which would have all the equipment required in order to perform the task and provide an understanding of how a practical lab operates. This consists of the erlenmeyer flasks, beaker, bunsen burner, microscope, thermometer, graduated cylinders, and test tubes. Due to practical objects often used in a lab, the user would feel the VR world to imitate an actual lab. In addition to the equipment, the user would be in a lab classroom environment with lab benches and faucets. The chemicals will also be labeled in order for the user to see and utilize.



Scaling:

The teleportation aspect would assist in understanding the macroscopic and microscopic factors of chemistry. Hence the ability to zoom into a reaction is mandatory in order to comprehend the movement of the molecules and the interaction between them. This delineates that some reactions are not fully successful as others since some molecules do not react with each other when colliding. Additionally, the a scale would be placed on the side of the VR screen in order for the user to comprehend how close up they are to the reaction.


Br
Benzene
Butane
Load
Save
AR mode
Load
Save