***Programming Project Idea***

The idea is to be original and science related. For originality, and since I have access to an HTC Vive, I thought it would be a great idea to work in virtual reality. For the science part, the first thing I thought of was chemistry. It’s a simple subject, the way you work around it is very methodical and the way to write the whole thing in java is very structural and simple to imagine.

The general idea is that you spawn directly in-game, in a chemistry lab environment, you can spawn any tools you need, any substance you want and you have all the elements available from the periodic table, at the temperature you want them. You can mix stuff together and see the reactions. Physics are included for all manipulatable objects. The game will be 3D as it’s in VR.

Features:

* A menu on a wall which includes settings, quit, reset level and whatever it is we come up with later on
* Different levels of realism; Realistic, where the atmosphere around the player matters for them to stay alive, for example, Simple, you can do whatever you want without any restriction. My original idea was to have a health system for the player who would have to use precautionary measures like wearing a chemistry/hazmat suit or a fume hood, but the player would not actually die, instead the state of the player will be displayed in some kind of output console, pointing out if the player died, and the cause of said death but not actually killing them and making them restart by resetting the world directly. The health system will be further discussed in the team to decide what we really want to do. (Optional due to amount of time available)
* A periodic table on the wall. The player will be able to spawn whatever element from the table at any temperature set using a slider and/or spinner input. The state of the element, at its most simple physical form (H2 for Hydrogen), shown dynamically with a color code on the periodic table
* A list of substances on the wall, used to spawn substances directly instead of having to go through the entire process of creating them every time you need them. The player will be able to look through the list using the touchpad on the controller, pointing at the list, as a scroll wheel. The player will also be able to enter a String in a field at the top of the list and search for the chemical formula, name, scientific name, etc. Maybe, depending on time available, some options like “Only display what contains H” for example.
* The player will be able to teleport around (motion sickness is very common when moving in-game in VR but not actually walking in real life, hence why teleportation will be used instead)
* The player with their hand empty, will be able to point at an object and get a quick description of the object. For example, a container will display what container it is, if it contains something, display what and how much of it and other details. While holding something in their hand, will instead directly display the description of the object being held.
* When a player’s hand hovers over an object that can be held, a slightly bigger, brightly colored and translucid, same model will be used as a highlight to indicate that the object can be held. The object can then be grabbed using the trigger button. When the trigger button is released, the object is dropped. This can be toggled using either grip buttons on the controller; while holding an object, pressing the grip button will activate “static hold” making it so the player doesn’t have to hold trigger for the object to stay in their hand. The object can then be dropped by pressing either grip button again.
* Other finishing touches if time is available like breakable container dropping on the floor and breaking, releasing their contents, and more.

This is probably not a complete list of features, but gives a good idea of what I wanted the project to be.

The project will be coded using jMonkeyEngine SDK 3.0 using the jMonkeyVR libraries for working with VR and the creator of those libraries’ custom jMonkeyEngine main libraries for better VR support.

I’ve been working with these tools for a couple months now, mainly during holiday break, getting myself to familiarize with the mechanics inside VR and how we are going to go about making the idea possible. For now, I’ve got a good grip on how things work and how we’re going to make the rest work as well. How I see it, the amount of time it’s going to take to do the project is reasonable with the time we have.