Periodic Table ReadMe

How to Open

After unzipping the file, follow this file structure to open the Unity Scene:
Periodic Table > Assets > Periodic Table.unity

Scenes

The classroom, the periodic table, the tile, the structure, and all the interactive scripts are contained in the scene: “Periodic Table”. The quiz room is contained in the scene: “Quiz Room”.

Settings

When you put the HMD on, you will see a periodic table on the front wall, three baskets on the left filled with atomic structure particles (electrons, neutrons, and protons), a table on the right, two desks at the back. When you select an element on the periodic table, the atomic structure will float above the table on the right and update a tile on the wall with the periodic table.

How to play

This game is played with the HTC Vive.

1. **Select an element from the periodic table:**

   To select an element, use either Vive controller to touch a colored element on the periodic table and push the trigger button. After the element is selected, all the information including atomic number, atomic mass, charge and symbol displayed on the tile in the center will be updated. The atomic

structure will be updated as well. The model will first shrink and then grow to the correct structure.

2. **Add protons/neutrons/electrons:**

   Use either Vive controller to touch a particle (proton, neutron or electron) in a basket and push the trigger button to hold it. Then move the particle towards the atomic structure on the right wall to add the particle to the structure. Once that particle is close to the structure, release the trigger for it to add. The information on the tile and table will be updated based on how many particles the user adds/removes and which type they are. The selected element of the periodic table will also be updated if you add or remove protons.

3. **Remove protons/neutrons/electrons:**

   Use either controller to touch a particle on the atomic structure above the big table. If no structure is present, select one from the table first (see step 1). Once intersecting, press the trigger button. The particle will then disappear from the structure and update the tile and periodic table accordingly.

4. **Deselect an element:**

   To deselect and element from the table, use either Vive controller to touch the currently selected element from the table and press the trigger. The

element square will then return to place on the table and the tile and atomic structure will reset their initial values.

5. **Movement:**

   If the designated play space is too small to reach everything, the player may use either Vive controller touchpad to steer themselves in the direction they need to go. The user may simply point in the direction they wish to go, press forward on the touchpad, and then they will begin moving that way.

6. **Change Scene:**

   To switch between the learning mode and quiz mode, face the back of the classroom. There you will see a white circle containing text of which scene you will move to. Hold either Vive controller over the circle and watch the progress bar fill up to 100% before switching scenes.

Steering

One can use either Vive controller to steer by pushing the touchpad button. There are three states for the steering: NotSteering, SteeringForward, and SteeringBackward. Movement has been restricted to the X and Z axis.

Highlighting

Bring your controller in contact with the free particles in the bins or with the element tiles on the Periodic Table to highlight them before selecting them using the Trigger button.

Virtual Hand

The user can use either Vive Controller to manipulate objects by touching the object and pressing the trigger button. There are four states: Open, Touching, Closed, and Holding.

- The Open state is used for when the user is not selected or touching any interactable object.
- The Touching state is triggered once the user's controller is intersecting with an interactable object.
    - We have modified the 5UDE script to allow the periodic table and to be manipulatable but will not form any joints so the user cannot move the objects. The same has been done for the particles which are part of the atomic structure.
    - After selecting one of those items, the script will change to a new state of Closed.
- The Closed state does nothing until the trigger is released, upon which it returns back to the Open state.
- The Holding state is used on all other interactable objects (namely the loose particles to be added to the structure) after forming a join in the Touching state.