Project Deliverable D

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# Introduction

In the previous deliverable, our team benchmarked with other products and developed our ideal/acceptable target specifications that will be our goal for the rest of the term. In this deliverable, the team decides on which concept to bring to life based on the last deliverable. We each have three or more concepts, which we discuss, expand, and categorize into the appropriate subsystem of the product they fall under. After, we combine ideas together to create three solid designs for the project. These designs are then screened with the target specifications and depending on the winner, as well as personal voting, a main design is chosen.

# Individual Concepts

Graeme:

* MAP (interactiveness and feedback)
  + User can exit the game momentarily and see a map of their progress, which includes all concepts they have passed
  + For each concept there will be a short report of the concept, including which areas they succeeded in and where they may need to reinforce some knowledge before completing the game
* PRELUDE (accuracy, size to scale)
  + While the user will have started their VR experience, before they can proceed in the game there should be a short portion of theory of organic chemistry, putting emphasis on molecule size, how things interact, etc,
  + The goal of this is to make the physical portion of the game make sense to the user, rather than them going through the motions
  + The theory is essentially the microscopic, and the rest of the game is the macroscopic
* DETOUR
  + If the user has stuck on a certain level, they have the option of taking a MC quiz on the material they have previously covered in the game in order to move past.
  + This option allows the user to put their practical skills to the test
  + If they do not succeed

Andre:

* NPC
  + NPC asks user multiple choice question
  + User answers multiple choice questions
    - If the user is wrong, then the user loses 100 points, and the NPC gives a hint in the form of a remark.
    - If the user is correct, then the user gains 1000 points, and moves on from the question.
  + The point system is used to add an element of gamification
* 6ix block
  + User gets to choose which view they want to start in before the scenario begins.
  + They then enter the chosen view, and view a scenario.
  + They get to change a specific aspect and they view the changes in the scenario
* 2 face
  + User starts with the macroscopic world in front of them, and the microscopic world behind them.
  + They can teleport to either view
  + They can change specific elements of each view, and maneuver between the 2 at any time to see the consequences of their actions.
* lost in the microverse
  + The user starts as being lost in the microscopic world, and they have to complete tasks by altering reactions
  + The user finally escapes the microscopic world, and sees the effects that their actions in the microscopic world had on the macroscopic world.

Victoria:

* Weapons
  + A way to get the user interacting with the game would be give them a weapon every time they have to decide between something or travel to somewhere
  + The weapons can include grenade, for low accuracy, and the bow and arrow, for high accuracy
* Tool Belt/Bag
  + The player has a bag or a tool box with tools that help the player move in the game
  + This could include a magnifying glass to see the macro and in the telescope, when in the micro, to see the macro
* Kitchen
  + The player is set in a regular setting and given a list of instructions to follow ex take out fry pan
  + The instructions leads them to create a chemical reaction

Anika:

* Concept 1
  + It would be more structured if we started off with the macroscopic portion, where they are performing reactions and then the microscopic. Then during the quiz portion, they will be shown the microscopic part of a reaction, (such as how molecules behave during crystallization) and they will be given options on what happens on the macroscopic portion. (whether they are right or wrong the macroscopic portion will also be displayed)
  + Since they will be shown giant sized particles when in the microscopic level, to clarify, we will compare just how tiny these particles really are to an object in real life. (let the atom be the size of a pea, compared to something small irl the size of the earth)
* Visuals
  + When they’re inside the object, giant sized particles move around vibrating and flowing as they do in the normal environment, or when we performed an action on the outside world, going inside the object allows the user to visually see the movement and collision of particles bonding together in a process.
  + Have a little guide touring them through the process, to go inside particles, the user jumps along with the guide. Make the player jump in to go inside the object reacting.
  + To go from microscope to macroscope they could be launched
* Material
  + Inside the microscopic level, we could choose weather conditions that affect the motion of the particles
  + Educational aspect: we could talk about how thermodynamics, changes in pressure and liquids of different densities are affected.
  + Mention that the properties of molecules affect what happens in the microscopic level

Fikunmi:

* Hands on Interview
  + The scenarios learned are both tested again at the end in a skill interview format
  + Allows for a final recap of both scenarios to get a better understanding of the user’s retention and understanding of the learning outcomes
* Bridge to the Other Scale
  + Shows a system where you have to change things at the different scales to be able to access the end of the game
  + Can incorporate both microscopic to macroscopic and vice versa in the same scenario type
* Save the System
  + Tests the user’s understanding of the lesson/objective by making them “save” the scenario by selecting the correct change to make in micro/macroscopic to have the desired effect on the opposite scale
  + User has a limited number of decisions before they fail the level/scenario

# Group Concepts

|  |  |
| --- | --- |
| **Subsystems** | |
| Scenario | Testing |
| 2 face | NPC |
| 6ix block | Save the System |
| Lost in the microverse | DETOUR |
| Weapons | |
| Tool Belt/Bag | Hands on Interview |
| Kitchen |  |
| Bridge to the Other Side | |
| Structure (from Macro to Micro) |  |
| Jump into objects | Predict macroscopic effects |
| Particle motion (vibrating, moving, colliding, forming bonds) | Summary of concepts taught (In the end) |
| Size comparison |  |
| Guide |  |
| Launched from Micro to Macro |  |
| Change conditions (Weather, volume, pressure, thermal, density) |  |
| MAP | |
| PRELUDE | |

Two main subsystems in our product are the scenario and the testing. The scenarios represent concepts that involve where the player would play. Whereas the testing involves how the players will learn and interact with the game. In the table above, we divided the concepts made into the two subsystems for easy combination. After this, we mixed and matched our favourite designs and came up with three scenarios to decide on.

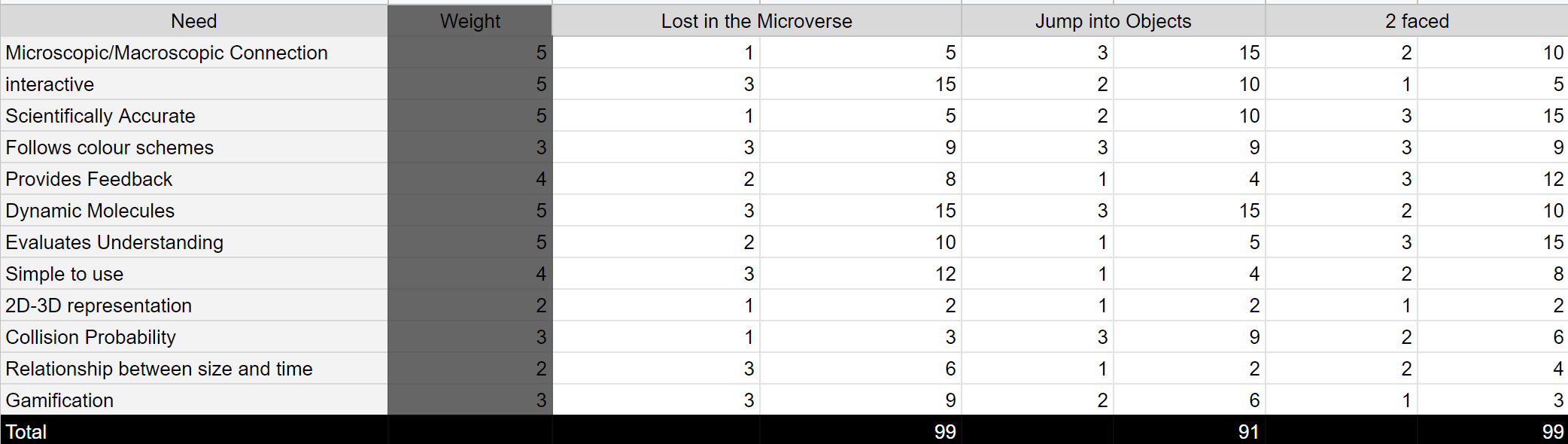
The first scenario combines these four concepts: Lost in the Microverse, Map, Weapon, and Tool belt/Bag. The user starts as being lost in the microscopic world, and they have to complete tasks by altering reactions. When the user finally escapes the microscopic world, they see the effects that their actions in the microscopic world had on the macroscopic world. While doing these tasks, the user can exit the game momentarily and see a map of their progress, which includes all concepts they have passed. The user will also have a bag of tools during the game. This can be later used in the testing portion, where they will be given a weapon to answer questions with.

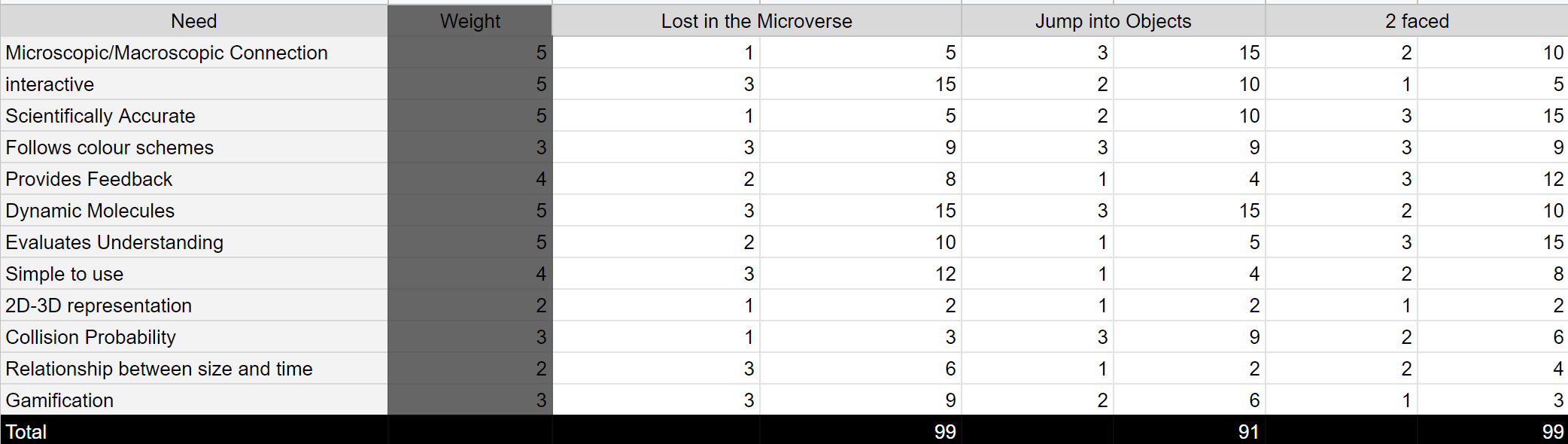
The second scenario combines these three concepts: Jump into Objects, Predict Macro, and Particle motion. We would have a little guide touring them through the process, to go inside particles, the user jumps along with the guide. The user can predict the macro when jumping out.

The third scenario combines these four concepts: 2 Faced, NPC, Weapons, and Tool Belt/Bag. This is where the user starts with the macroscopic world in front of them, and the microscopic world behind them. The users are tested with multiple choice and can use weapons to answer.

# Screening Solutions

* Scenario 1: **Lost in the Microverse**, Map, Weapon, Tool belt/Bag
* Scenario 2: **Jump into Objects**, Predict Macro, Particle motion
* Scenario 3: **2 Faced**, NPC, Weapons, Tool Belt/Bag





We screened the solutions according to our clients needs and used the original weight for those needs. By using this process, two solutions won. We then discussed which solutions were our favourite and that we would truly be passionate about implementing. It was a unanimous vote for scenario one, which we all felt was the strongest.

# Final Concept

Our final concept is called: lost in the microverse. It will be a game where the user seeks to escape the situation they are put in by following a list of tasks. If done correctly, the user leaves into the macro, where then can see the changes they have made. There will be a map guiding the user around. When the user is tested on their knowledge, they will be able to use weapons to answer the questions which come from inside the tool belt that will be accessible during the game.

# Conclusion

In this project deliverable, concepts to be used in our product were explored and evaluated under certain prerequisites. The concepts discussed covered a wide range of design criteria and target specifications that were previously outlined. The purpose of having a wide range of concepts was so they could be screened; this ensures our scenarios are chosen accurately and unbiased. Certain concepts were combined due to complimentary features and goals. The screening process involved weighing different product needs, and giving our concepts a score based on how well they meet a given need. This process is very important for the foundation of our project, as we are now able to develop it according to our concepts and design criteria.