

Sprint 1 Planning Document

Team 18 : Brendan Raftery, Kate Lorenzen, Vinson Luo, Jonathan Grider

# Sprint Overview

During this sprint we hope to lay down the foundation of our application. The base implementation for the frontend will be done so that the application is visible to the users, and the users can interact with it. Meanwhile in the backend, the underlying structure of our database will be set up to allow interaction between the database and the client, and expansion for future sprints.

**Scrum Master:** Brendan Raftery

**Meeting Plan:** Tuesdays/Thursdays @ 7:30pm

**Risks and Challenges:**

This may be the most challenging sprint because of the work required for setting up the basics, and building everything from the beginning. A lot of trial and error may go into the process, for both the frontend and the backend. Developers working on the frontend must implement a working game space using both the Unity Engine settings and C#, as well as a usable UI that allows users to interact with the game objects inside the application. Backend developers must build the database structure to contain formatted information in the game for storing and parsing. The beginning is the hardest, and if we were to fall behind on the implementations in this sprint, we would put ourselves in a disadvantage for future sprints.

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# Current Sprint Detail

**User Story #1**

As a user, I would like to be able to see all of the elements and compounds that I have created within my workspace represented visually as an atom or collection of atoms.

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| --- | --- | --- | --- |
| # | Description | Estimated Time | Owner |
| 1 | Create Art Assets needed for Buddies | 2 Hrs | Vinson |
| 2 | Create Cosmic Ranch Class | 2 Hrs | Vinson |
| 3 | Create Basic Buddy Class | 6 Hrs | Kate |
| 4 | Create Algorithm to Generate Buddy Structures | 15 Hrs | Brendan |

Acceptance Criteria:

* Given that file size for this project is properly optimized, when the user opens the application to view the Triums, the only art assets that would be seen are basic geometric shapes (circle, pentagon, hexagon, etc.) .
* Given that the database is implemented correctly, when the user sees a Trium of a particular type, the information from the database should correctly determine the appearance of that Trium.
* Given that the Cosmic Ranch is properly set up, when the user runs the application, the buddies should not be overlapping one another.
* Given the Cosmic Ranch is properly set up, when the user runs the application, all buddies should be within the work area.

**User Story #2**

As a user, I would like to be able to perform Fusion on two atoms to create a new element.

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| --- | --- | --- | --- |
| # | Description | Estimated Time | Owner |
| 1 | Create Art Assets needed for the Fusion menu tabs | 2 Hrs | Vinson |
| 2 | Create Action Bar Class | 3 Hrs | Vinson |
| 3 | Create Algorithmfor the Action Bar UI | 4 Hrs | Vinson |
| 4 | Create Algorithm to perform Fusion | 5 Hrs | Jonathan |
| 5 | Create Algorithm to select existing Triums | 3 Hrs | Kate |
| 6 | Create art asset for reward system after performing an action | 2 Hrs | Vinson |
| 7 | Create animation for reward system after performing an action | 2 Hrs | Vinson |
| 8 | Set up a database to hold all of the needed Trium data that is needed to perform Fusion, Grouping, and Reactions | 5 Hrs | Jonathan |
| 9 | Create the author program to allow for developers to add new data to the database | 15 Hrs | Brendan |

Acceptance Criteria:

* Given that the algorithm is optimally written, when the user taps on the Action Bar, the Action Bar should respond by sliding into view from the side.
* Given that the Action Bar is properly set up, when the user taps on the Fusion button, the application should perform Fusion.
* Given that the selection algorithm is optimally written, when the user selects two atoms for Fusion, the two atoms will fuse into a new one.
* Given that the Fusion algorithm works correctly, when the user fuses the two atoms, the game will yield the atom with the sum of the two reactants’ atomic numbers.
* Given that Fusion is implemented correctly, when the user finishes performing Fusion, the data should be updated in the database’s data file.

**User Story #3**

As a user, I would like to be able to perform Group on two or more atoms to create a single-element molecule.

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| # | Description | Estimated Time | Owner |
| 1 | Create Art Assets needed for the Group menu tabs | 3 Hrs | Vinson |
| 2 | Create Algorithm to perform Group | 5 Hrs | Jonathan |

Acceptance Criteria:

* Given that the Action Bar is properly set up, when the user taps on the Group button, the application should perform Group.
* Given that the selection algorithm is optimally written, when the user selects two atoms to Group, the two Triums will group into a new single-element molecule.
* Given that the selection algorithm is correctly implemented, when the user attempts to perform Group with atoms of different elements, the action will not be carried out.
* Given that the Group algorithm works correctly, when the user groups the two atoms, the game will yield the correct molecule.
* Given that Group is implemented correctly, when the user finishes performing Group, the data should be updated in the database’s data file.

**User Story #4**

As a user, I would like to be able to perform a Reaction on two or more Triums to create a compound.

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| # | Description | Estimated Time | Owner |
| 1 | Create Art Assets needed for the Reaction menu tabs | 3 Hrs | Vinson |
| 2 | Create Algorithm to perform Reaction | 5 Hrs | Vinson |

Acceptance Criteria:

* Given that the Action Bar is properly set up, when the user taps on the Reaction button, the application should perform Reaction.
* Given that the Reaction algorithm is properly set up, when the user performs Reaction, the application will provide a guideline to formulating the compound of choice.
* Given that the selection algorithm is optimally written, when the user selects two or more Triums of choice to perform Reaction, the reaction will yield a new compound.
* Given that the Reaction algorithm is correctly implemented, when the user attempts to formulate the compound of choice with the wrong reactants, the action will not be carried out.
* Given that Reaction is implemented correctly, when the user finishes performing Reaction, the data should be updated in the database’s data file.

**User Story #5**

As a user, I would like to be able to collect atoms representing the naturally occurring elements.

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| # | Description | Estimated Time | Owner |
| 1 | Create Wormhole Class | 4 Hrs | Jonathan |
| 2 | Create UI assets for element selector | 2 Hrs | Vinson |
| 3 | Create algorithm for randomly generating atoms | 2 Hrs | Jonathan |
| 4 | Connect atom generation to the Cosmic Ranch and in turn the User’s Backpack | 4 Hrs | Jonathan |

Acceptance Criteria:

* Given that the UI elements are working correctly, when the user does a single tap on the wormhole, it will randomly generate an atom that has been discovered.
* Given that the UI elements are working correctly, when the user holds down on the wormhole, the wormhole will display a wheel for users to select a group of atoms that will have a higher chance of spawning.
* Given that the algorithm is written correctly, when the user selects a group of atoms to be randomly generated, the wormhole will only spawn one of the atoms from the selected group.

**User Story #6**

As a user, I would like to be able to refer to a glossary for all of the Triums discovered thus far.

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| # | Description | Estimated Time | Owner |
| 1 | Create the StateHandler class | 10 Hrs | Kate |
| 2 | Create the State class | 3 Hrs | Kate |
| 3 | Create the Glossary class | 5 Hrs | Jonathan |
| 4 | Create an Algorithm to sort the list of Triums | 3 Hrs | Kate |
| 5 | Set up the Stats Bar (which includes the glossary) | 5 Hrs | Kate |

Acceptance Criteria:

* Given that the StateHandler is correctly implemented, when the user attempts to access or exit any state, the application should allow the user to enter or quite the state without fail.
* Given that the glossary is correctly implemented, when the user discovers any new Trium, it will be recorded in the glossary.
* Given that the UI for the glossary is implemented correctly, when the user attempts to view information that is too big for the screen to hold, they should be able to scroll down the page for access.
* Given the glossary is implemented correctly, when the user refers to the glossary to view the elements in the Elements tab, the elements will be shown to the user as sorted by atomic number.
* Given the glossary is implemented correctly, when the user refers to the glossary to view the molecules in the Molecules tab or the compounds in the Compounds tab, the compounds and molecules will be shown to the user as sorted alphabetically.

# Remaining Backlog

**Functional**

1. **User**
   1. Introduction
      1. As a user, I would like a tutorial for most features of the game
      2. As a user, I would like to be able to zoom in and out of my workspace to see larger and smaller areas
   2. Individual Atoms
      1. ~~As a user, I would like to be able to collect atoms representing the naturally occurring elements~~
      2. ~~As a user, I would like to have my collection of atoms visualized inside of my workspace~~
      3. ~~As a user, I would like to fuse elements to create another element with the combined amount of protons.~~
      4. As a user, I would like to be able to select an atom from the workspace to look at its stats and information
      5. As a user, I would like to be able to refer to a journal for facts and trivia on an atom of interest
      6. As a user, I would like to be able to increase my atoms’ level stats
      7. ~~As a user, I would like to be able to refer to a glossary for all of the possible atoms discoverable in the application, and the ones discovered thus far~~
      8. As a user, I would like to be able to view a visual representation of the elements I have unlocked on the periodic table
      9. As a user, I would like to be able to discard an atom into a wastebin after receiving a notification to make sure I am certain of my decision
   3. Compounds
      1. ~~As a user, I would like to be able to perform chemical reactions on chemical structures within my workspace to formulate new ones~~
      2. ~~As a user, I would like to be able to perform ‘Group’ on two or more atoms to create a single-element molecule.~~
      3. As a user, I would like to be able to open a list that shows all of the possible compounds that are made up of at least one of the structures that is within my workspace
      4. As a user, I would like for there to be a chemical formula listed at the top of the user interface that will help guide me in selecting the chemical structures needed for the reaction or bonding I am in the process of completing
      5. ~~As a user, I would like to have my collection of chemical compounds visualized inside of my workspace~~
      6. As a user, I would like to be able to select a compound from the workspace to look at its stats and information
      7. As a user, I would like to be able to refer to a journal for facts and trivia on a compound of interest
      8. As a user, I would like to be able to increase my compounds’ level stats
      9. ~~As a user, I would like to be able to refer to a glossary for all of the possible compounds discoverable in the application, and the ones discovered thus far~~
      10. As a user, I would like to be able to view a visual representation of the compounds I have unlocked
      11. As a user, I would like to be able to discard a compound into a wastebin after receiving a notification to make sure I am certain of my decision
   4. Settings
      1. As a user, I would like to be able to have different background color options available for me to chose from in the settings menu
      2. As a user, I would like to be able to turn sound effects on and off in the settings menu
      3. As a user, I would like to be able to turn any music that plays on and off in the settings menu
      4. As a user, I would like to be able to turn off and on the faces that appear on the chemical structures
   5. Education
      1. As a user, I would like to be quizzed to see if I am retaining the information taught to me on the app
      2. As a user, I would like for facts that I unlock to be narrated and accompanied with a picture if applicable (if time allows)
   6. Social
      1. As a user, I would like to share newly discovered elements, molecules and compounds with others (if time allows)

**Non-Functional**

1. Must be able to play this game on Android products
2. Must be able to play this game on Apple products (if time allows)
3. Must have an interface that is intuitive and easily navigable
4. Must have a database that is easy to maintain and extend for new content
5. Must not be too complicated that detracts from gameplay experience