Project Overview

- Cell Builder provides an engaging and educational experience for middle school biology students.
- Motivation for project
  - Teaching students the intricacies of cells, organelles, and their functions can be very difficult.
  - If the student can engage with the material in a fun and interesting way while still teaching the facts, they will more easily retain the information.

Overview of Features

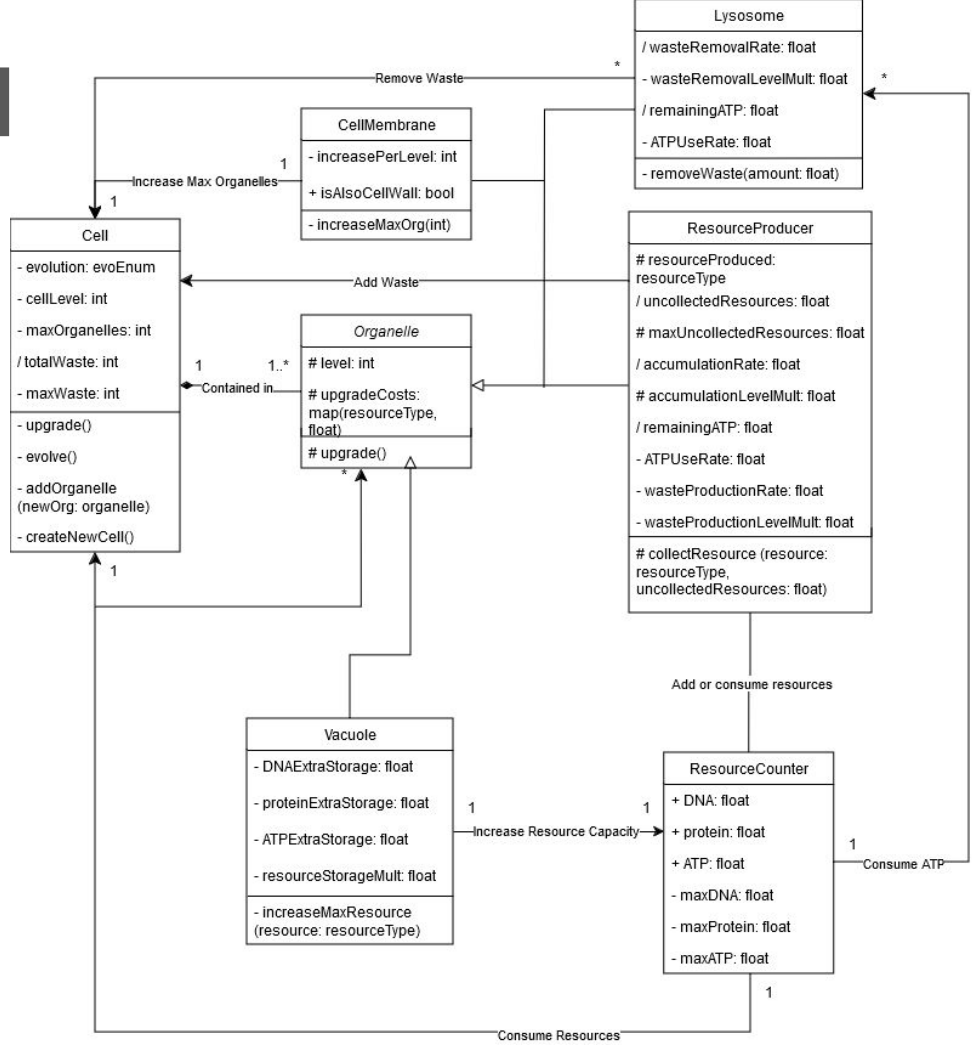
- Build and upgrade organelles within a cell that manage its functions and produce helpful resources.
- Upgrade your cell to unlock more organelles.
- Undergo mitosis to create another cell.
- Evolve during mitosis to create a new type of cell.

Domain Research

- Investigated what organelles each cell has.
- Learned their basic functionally and discussed how to approximate that functionality in game.
- Project Constraints
  - The game must be fun to keep players engaged
  - The game must also teach players about the topics involved
  - The content of the game, both gameplay and educational, must be easily digestible for kids as young as 11.

Part II: Model-based View of System

- Cells are represented by the Cell class, which contains organelles.
- Organelle holds the basic info all organelles have.
- Several classes inherit from Organelle to make specialized functionality.
- Classes talk to the resource counter when they want to add or consume resources.

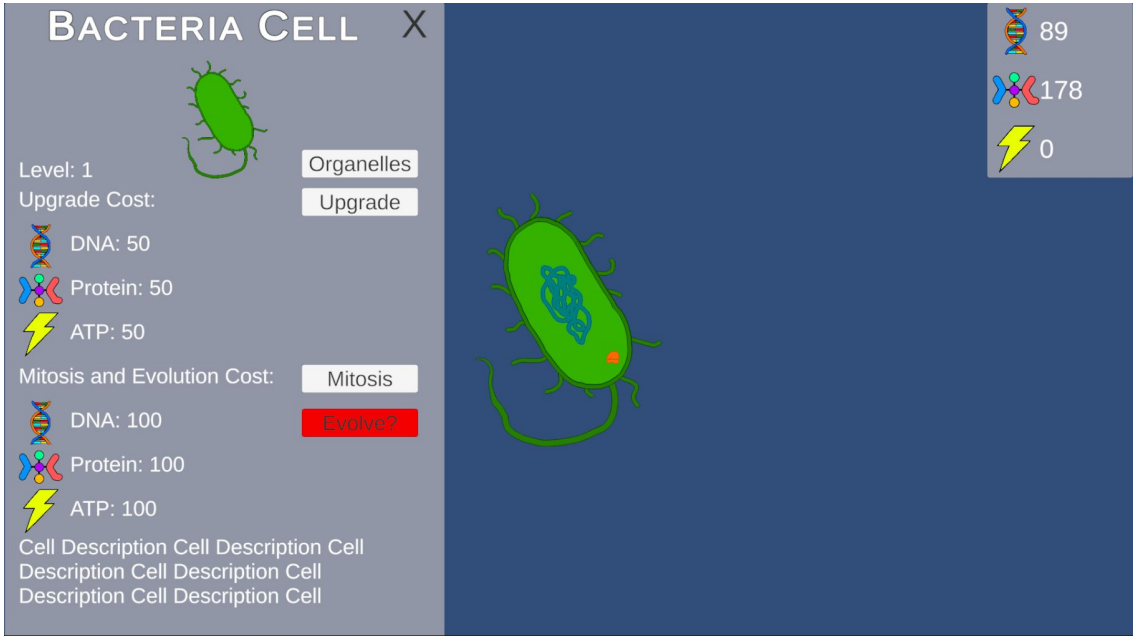


Part III: Demonstration

- The game consists of a top-down view of the player's cells.
- The player can move the camera and zoom in or out with the mouse.
- The player's resource count is shown in the top right.
- When an organelle is clicked, it opens up a side panel, displaying information about the organelle.
- This side panel has a button to display information about the cell, which has a similar button for building new organelles.

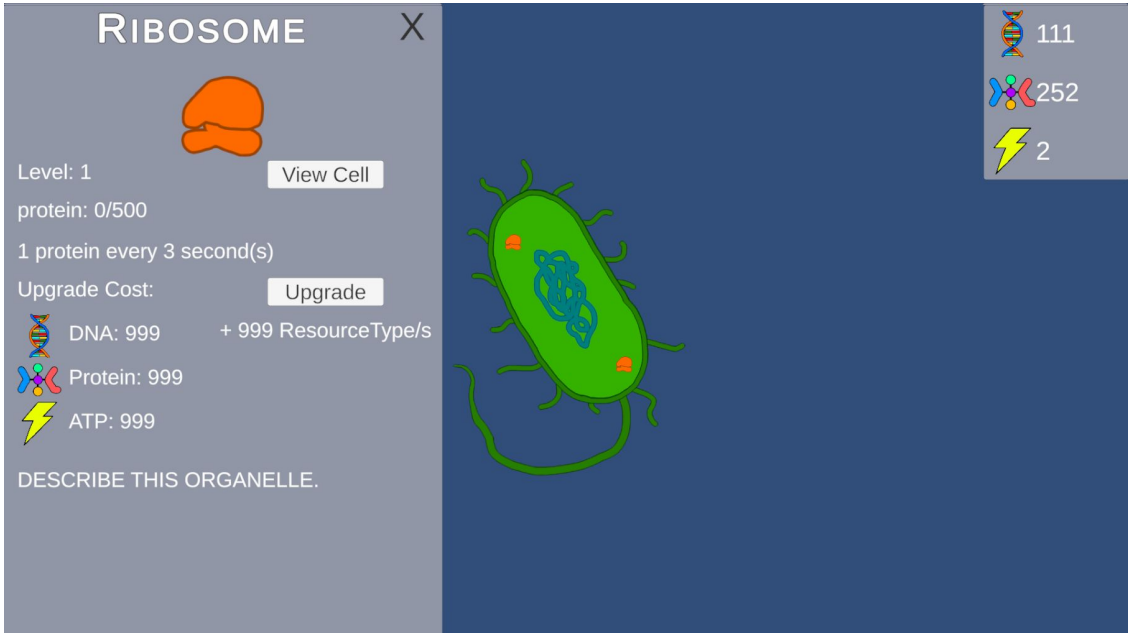
Scenario 1:
Upgrading Cell and Organelles

1. Find the cell you want to do upgrades in.
2. Click on an organelle and click “Upgrade.”
3. Click “View Cell,” then click “Upgrade.”



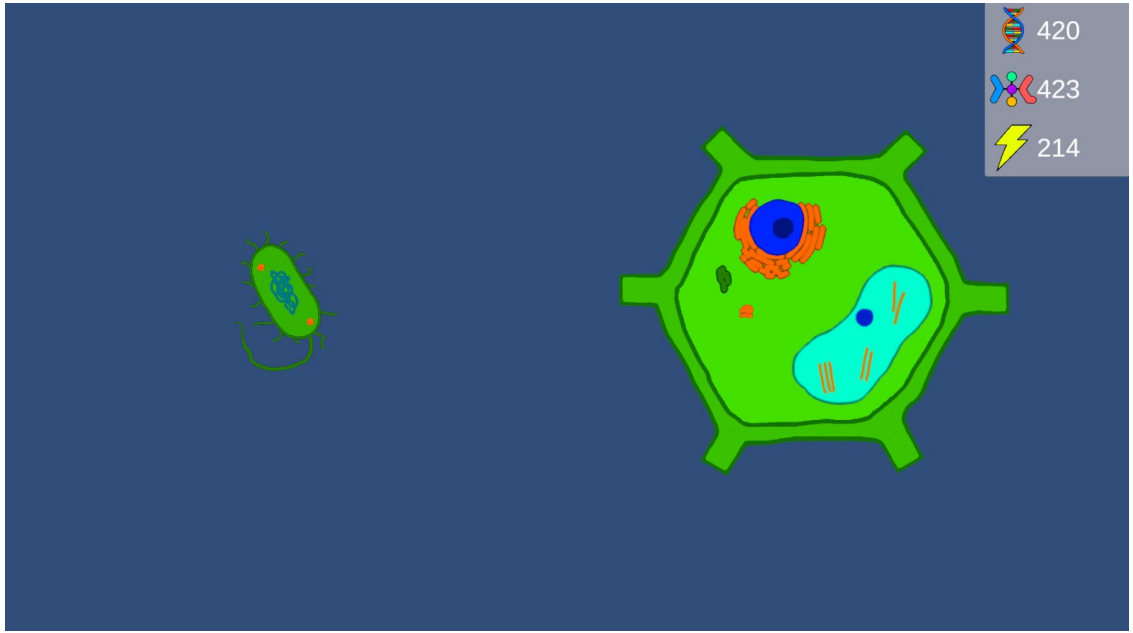
Scenario 2:
Building New Organelles

1. Navigate to the cell menu through one of the cell's organelles.
2. Click "Organelles."
3. Choose an organelle by clicking "Build."
4. The organelle can now be found in the cell.



Scenario 3:
Mitosis and Evolution

1. Navigate to the cell menu through one of the cell's organelles.
2. Click evolve to toggle evolution.
3. Click mitosis to create a new evolved cell.



Acknowledgements

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