
Space Station: Reaction

Mr. Sperling - Lockheed Elementary

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STEM Standards

- S5P1. Obtain, evaluate, and communicate information to explain the differences between a physical change and a chemical change.
 - a. Plan and carry out investigations of physical changes by manipulating, separating and mixing dry and liquid materials.
 - b. Construct an argument based on observations to support a claim that the physical changes in the state of water are due to temperature changes, which cause small particles that cannot be seen to move differently.
 - c. Plan and carry out an investigation to determine if a chemical change occurred based on observable evidence (color, gas, temperature change, odor, new substance produce)
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About the Game

- Space Station: Reaction is a puzzle game about solving puzzles based on chemical and physical changes.
 - Players also have to combat enemies throughout the levels while solving these puzzles.
 - The final level features a boss enemy, and the player can answer questions in order to weaken the boss enemy, but answering incorrectly will slightly strengthen the boss.
(Not in build)
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Breaking down the Problem

- Our goal was to make a game teaching students about the differences between chemical and physical changes to objects.
 - We wanted to make a puzzle game, as we personally believe that puzzle games are the best way to learn material through a game.
 - However, young students may not enjoy just straight puzzle-solving, which is why we included the combat element.
 - The combat element is not heavily focused on, besides the boss level, as we wanted the focus to be on the puzzles. The combat is meant to help keep the players engaged and not get bored just solving puzzles. (not implemented in current build)
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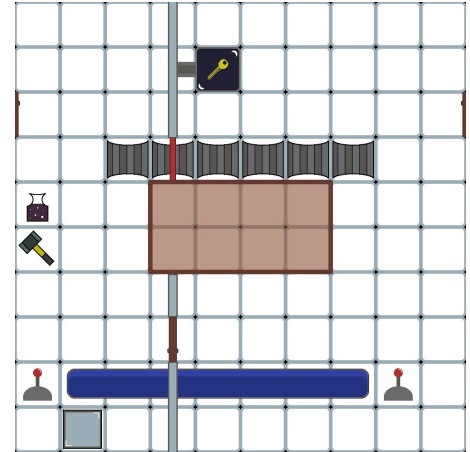
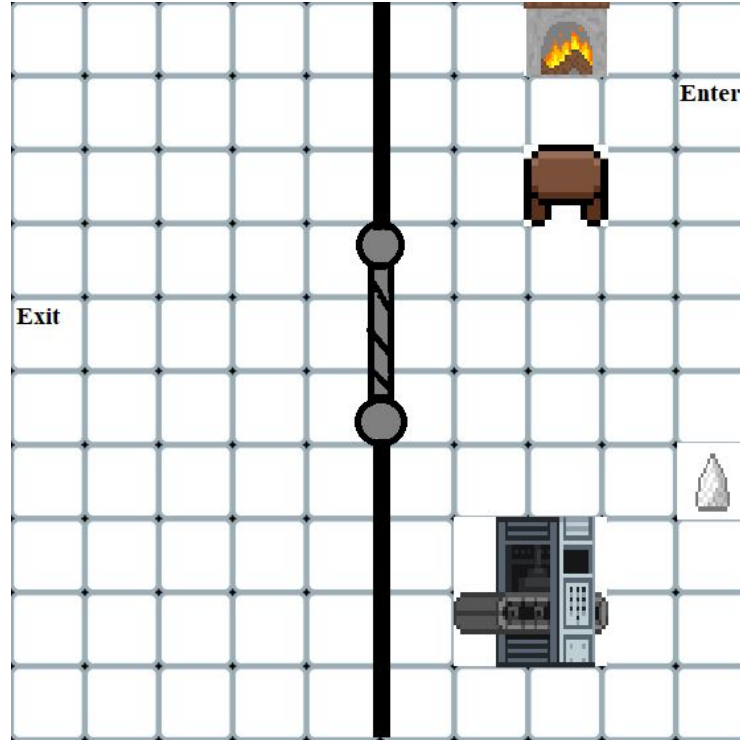
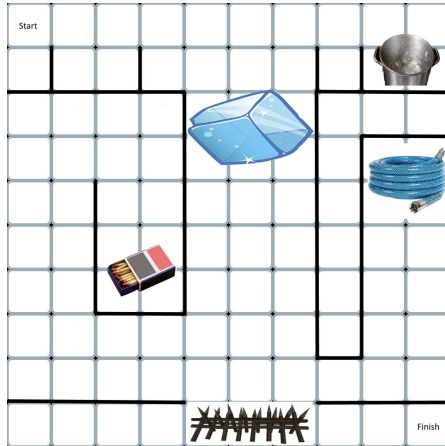
Breaking down the Problem (contd.)

- **Boss Level**
 - The Boss Level is meant for a type of review, where the first few levels teach you some of the types of physical and chemical changes (and the differences between the two).
 - Periodically throughout the level, a question will be asked based on some of the material that the player has been through, and the player is tasked with choosing the right answer.
 - The right answer will weaken the boss slightly, but the wrong answer will strengthen the boss, but not enough to not allow room for forgiveness for answering incorrectly.
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So How did We Design This Game?

- We each designed a level, and thought about which issue we would like to cover.
 - Eric and Ronald's level, for example, deal with physical changes (melting ice, burning wood and putting out the fire, smashing a block, etc.).
 - Michael's level deals with both physical and chemical changes (compressing sugar into cubes, and adding and mixing it to tea).
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Mockup Designs



Design Continued

- We also designed a Dialogue system to interact with the player
 - Can be used to guide the player and ask them questions
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Dialogue System

Well-Dressed Old Man

Oh hey there.

Next



Overall Progress

- Overall, the game is currently playable, minus a few features that were left out in the current build due to technical issues. In the game's current state, we feel that it does an admirable job in either teaching the player the difference between physical and chemical changes, or reinforcing the topic onto a player that is having trouble understanding how to tell the difference between the types.
 - Currently, there are four fully playable levels, the last one being the Boss Arena.
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Issues Faced During Development

- Time Constraints
 - Initial Plan was to get another level done, focusing more on chemical changes, but due to time constraints we were not able to get it functional.
 - Some features, such as the boss level, have been left out of the current presentation build due to technical issues.
 - Workload Constraints
 - Other classes, jobs, etc. hampering the speed of development.
 - Scheduling Constraints
 - Due to conflicting schedules, it was difficult to get a common time that everyone could be free to attend these meetings with Mr. Sperling or the students.
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Possible Future Directions

- More levels.
 - More complex levels that are not as easy to solve and require some thought into solving them.
 - More variety in enemies or boss scenes to keep the player more engaged and eager to complete the game
 - Better tutorial to explain the game to a newcomer.
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Onto the Live Demo

- Here we go...