PRESENTING MUSICAL CONCEPTS THROUGH
VIDEO GAME TECHNOLOGY

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1. Abstract

There are many difficulties introduced when learning to play a musical instrument. The accessibility of acoustic instruments due to their design can introduce physical inhibitors for beginners. Music-oriented video games, and software-based musical instruments in general, may be viable alternatives to composing and performing with traditional acoustic instruments. The present study suggests a positive link between the interests of those who play music-oriented video games and those interested in musical instruments and composition. The entertaining and challenging aspects of games make players interested, and are conducive to supporting the comprehension and retention of presented concepts. Few video games on the market teach musical concepts. We explored the value and implementation methods of music-oriented video games as a guideline toward developing our own music game prototype. This prototype facilitated self-directed musicianship by presenting basic music concepts and teaching the foundations, such as tone recognition, in a fun and easy way. We then proceeded to create a survey questionnaire to test the prototype's initial aesthetic validity with both musicians and non-musicians.

2. Acknowledgements

The members of Team Chordscan would like to thank all the people who were involved in testing our game, and gave us their honest opinions regarding it. Each of your observations and evaluations were vital to the improvement of the prototype.

We would like to sincerely thank V. J. Manzo for effecting and advising this project. Without him, we would not have the opportunity to collaborate and work towards a mutual goal.

We are grateful that he met with us each week in order to discuss both long and short-term goals. His constant support by listening to our ideas, offering insightful feedback on what we have accomplished thus far, providing the necessities that we require, and having an enthusiastic, yet calm-and-collected personality kept us optimistic and focused in our endeavor to make this a grand project experience.

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3. Introduction

Music is an integral part of all cultures. However, learning musical concepts is a difficult process. Mastering an instrument can take years of training. The individual will need to learn fundamental components of music theory before diving into composition. Composition is a difficult process because it requires some level of musical understanding and intuition. To the non-musician, the process of learning music can seem like a massive undertaking, which may discourage potential musicians.

Music should be fun to learn. Becoming actively engaged results in a better performance from the players. In an article written by Bhatia (2014), active learning uses class activities and discussions as a method of teaching, with an emphasis on group work. Students involved in active learning are 1.5 times more likely to succeed than those who are in a traditional lecture. The ones who are actively engaged outperform those who only listen by 6 percentage points on the same exams (Bhatia 2014).

We wanted people to get that learning experience by creating a video game that teaches basic theory. It can be educational and entertaining for both musicians and non-musicians, who would be attracted by the music score and visuals. Those with a knack for music would be inclined to pick up this game to see what music concepts are introduced. The objective was for the game to emphasize theory in a fun way, and make it easier to remember what is being taught.

The goal of this project was to present concepts of musicianship in an informal way through the use of video game technology. In order to create a video game, we needed to figure out how we should approach our audience through art, music, and the structure of the game. We have included a game design document, which shows the cover artwork, as

well as the title, tagline, and team members. It explains in detail the summary and vision

for the game. It presents the user interface, gameplay, production, and all other aspects of

the game's design to familiarize the reader with the project. The document, which is

located in Appendix A, guided us in the development of our prototype.

4. Background

4.1 Educational Value of Video Games

Education in today's society is still emphasized through learning in a traditional classroom setting. Teachers are heavily relied upon to introduce different topics, and it is the student's responsibility to absorb all of that material. Going through the process of attending classes, taking notes, and reading textbooks has proven to work, but it is not the only way to facilitate the learning experience.

4.1.1 Statistics of Educational Games

Recent studies show that video games have proven to be beneficial for students. According to Heick (2012), an analysis that was done in 2009 discovered that children who play educational games are not likely to develop attention problems in school. Furthermore, 70% of teachers stated that, by including educational video games as part of the curriculum, student engagement has increased (Heick, 2012).

4.1.2 Guitar Hero & Rock Band

Music games have become increasingly popular in the 21st century with the advent of *Guitar Hero* and *Rock Band*. Good (2009) mentioned that children from the United Kingdom were inspired to experiment with music after playing, and adults with kids in the Paul Green School of Rock Music program had good experiences with the two games, as well. While they do not clearly teach music theory nor help one become a member of a rock band, the two do reinforce certain musical skills, and provide a true experience (Good, 2009).

These types of games teach tone recognition, which is an important skill to have

when it comes to learning music. Good (2009) also stated that the player gradually

understands which key should be played as the song progresses, and extra features within

the games allow for further exploration. In *Guitar Hero: World Tour*, there is a music

studio mode that allows one to create an original song, utilizing the concept of tone

recognition (Good, 2009).

Another useful skill is rhythm, hence the term "rhythm-based games." When

performing a song, the player needs to know when the next key should be played,

therefore demonstrating rhythm (Good, 2009).

Not only do these games teach important concepts, but they possess music-related

benefits, as well. These games help players build confidence while performing a song that

continuously progresses, despite any mistakes being made (Good, 2009).

Another benefit players may have can be a greater appreciation for music, even up to

the point where one is inspired enough to pick up a guitar and take lessons. There are

claims that *Guitar Hero* and *Rock Band* have a considerable influence in the increase in

purchases of actual guitars, although these allegations are not verifiable (Good, 2009).

4.1.3 Wii Music

There is one game in particular that is especially useful and beneficial to younger

children. According to Kalning (2009), teachers are gradually utilizing *Wii Music* in

schools and afterschool programs. It has received a wide recognition for the advantages

that it provides, despite the fact that it was not a blockbuster hit in terms of sales and

reviews (Kalning, 2009).

In a typical classroom setting, students are constantly following specific instructions

from the teacher on what to do, and ever rarely have the opportunity to express

themselves in the arts. A video game that is integrated into the current school curriculum is much more student-friendly and far less intimidating than actual schoolwork (Kalning, 2009).

One aspect in which the game truly excels is musical creativity. The study (2009) shows that children are given the chance to experiment with more than sixty different virtual instruments. These instruments vary from the conventional piano and guitar to the unusual galactic bass and galactic horn. They can play three types of mini-games called "Mii Maestro," "Handbell Harmony," and "Pitch Perfect". In "Jam Mode," players are allowed to select an instrument and either play a song or improvise as part of a band (Kalning, 2009).

Those who were once shy and reluctant are now becoming more involved in the classrooms and interactive with their peers. Teachers have seen a dramatic improvement in the young students' improvisational and rhythmic skills, as well as their efforts and attitudes (Kalning, 2009).

4.1.4 PBS Kids

We wanted to get an even better idea of how music games can be beneficial. Reading online articles did help, but actually playing them would provide a firsthand experience. We went to the music section on the *PBS Kids* website, and played as many of the games as possible. All of them teach simple concepts, such as rhythm and composition. These types of games were exactly what we had in mind.

We learned that they taught rhythm and composition well, but we wanted to teach other concepts other than rhythm or instrument recognition. These games on the PBS Kids website introduced these concepts in a simple way, which may appeal to a much

younger audience than what we were aiming for. A few things that we felt the player

needed were more freedom in manipulating music and introducing more concepts to

them. If these games could introduce more musical ideas, then it would probably help the

player in recognizing tones and octaves.

5. Methodology

We wanted to create a video game that teaches musical concepts in an informal way. The background research we did provided a good starting point because it helped us realize that music games can be great learning tools. Our game should teach similar concepts, as well. We used our background research as a guideline, and approached the overall process of our game's creation by designing its layout, developing its features, and having players test it out.

5.1 Design

The creation process began with making a blueprint for the game. The structure needed to be well established first before we could dive into the actual implementation. We came up with all types of different concepts, but only a couple was appropriate for what we had in mind. We thought of stacking Sugar Pucks on top of each other and based on which Pucks were stacked would result in a chord being played. We thought that this concept may be too advanced, and would focus on playing guitar chords. Another concept we thought of was having the player place Sugar Pucks on a web to compose a song based on which Sugar Pucks were placed, and where they were placed on the web. This would introduce a composition mode for the game so that players could compose their own music. Before we could introduce these concepts we would need to introduce simpler ones such as tone recognition and octaves. These are the steps we had taken to come up with ideas and designs that eventually led to the creation of a game design document.

5.1.1 Objective

Brainstorming before doing anything else is always essential. We knew that the whole purpose of the project is to help people in some way. Our prototype just needed an objective that focuses specifically on music. We wanted to show that it can be fun and easy to learn the basics of sound. The four of us discussed, and eventually came to the conclusion that our game should revolve around teaching music to people who are not musically inclined.

5.1.2 Musical Concepts

The next objective was to come up with musical concepts for our video game. We felt that they should be somewhat similar to what was being taught in other music games. The idea was to start off simple by teaching the fundamentals first and then moving onto the more advanced theories as the player progresses. We came up with a handful that were good for the first two levels, but ultimately decided that tone recognition and octaves would be the most suitable options since that was our goal in introducing music concepts. For a prototype to be created, we only had time to introduce these simple concepts, and unfortunately some of the other ones mentioned before such as composition mode had to be postponed and eventually excluded in the prototype.

5.1.3 Storyboards

We wanted to have a good understanding of the general flow of the game. Words would help, but we felt they did not provide enough information. We needed accompanying visuals that were drawn and arranged in sequential order. This was where

storyboards come in. We created two of them, one for each level of the game. Both

showed what the typical player might do to overcome each challenge and move onto the
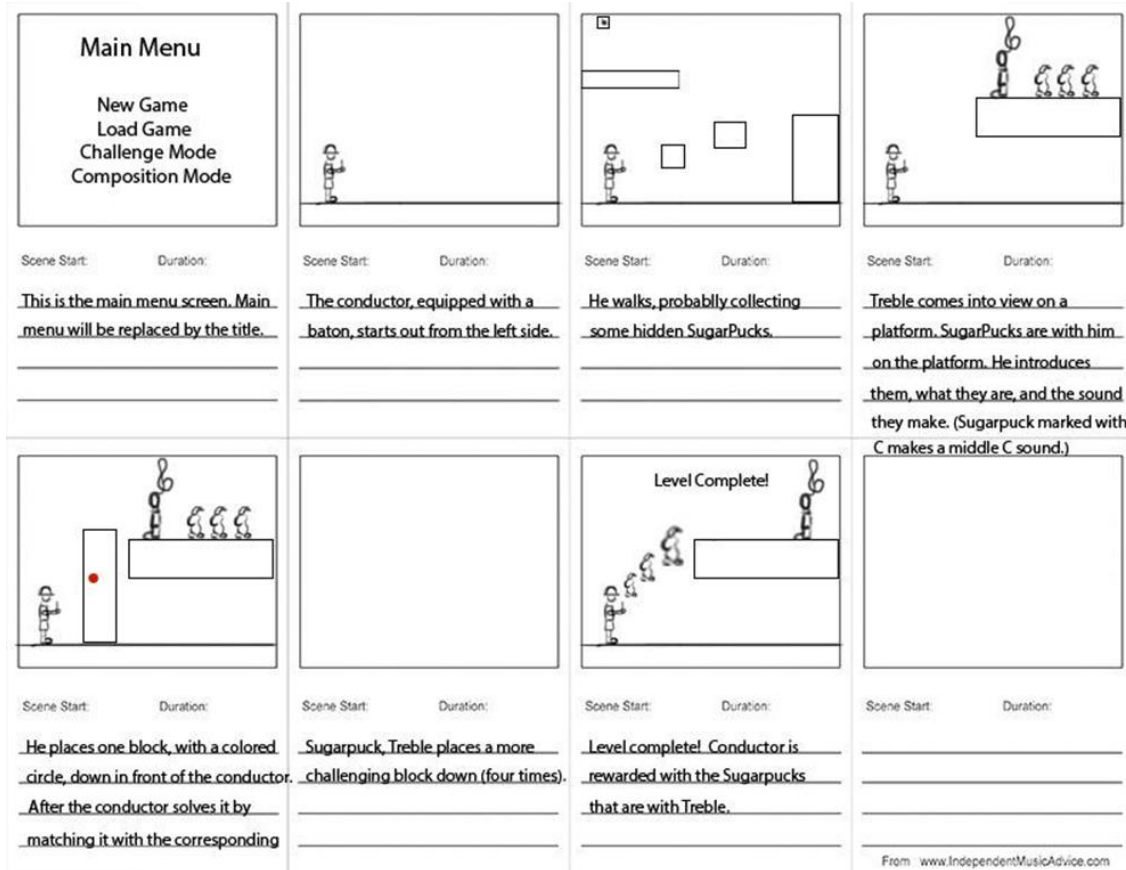
next stage.

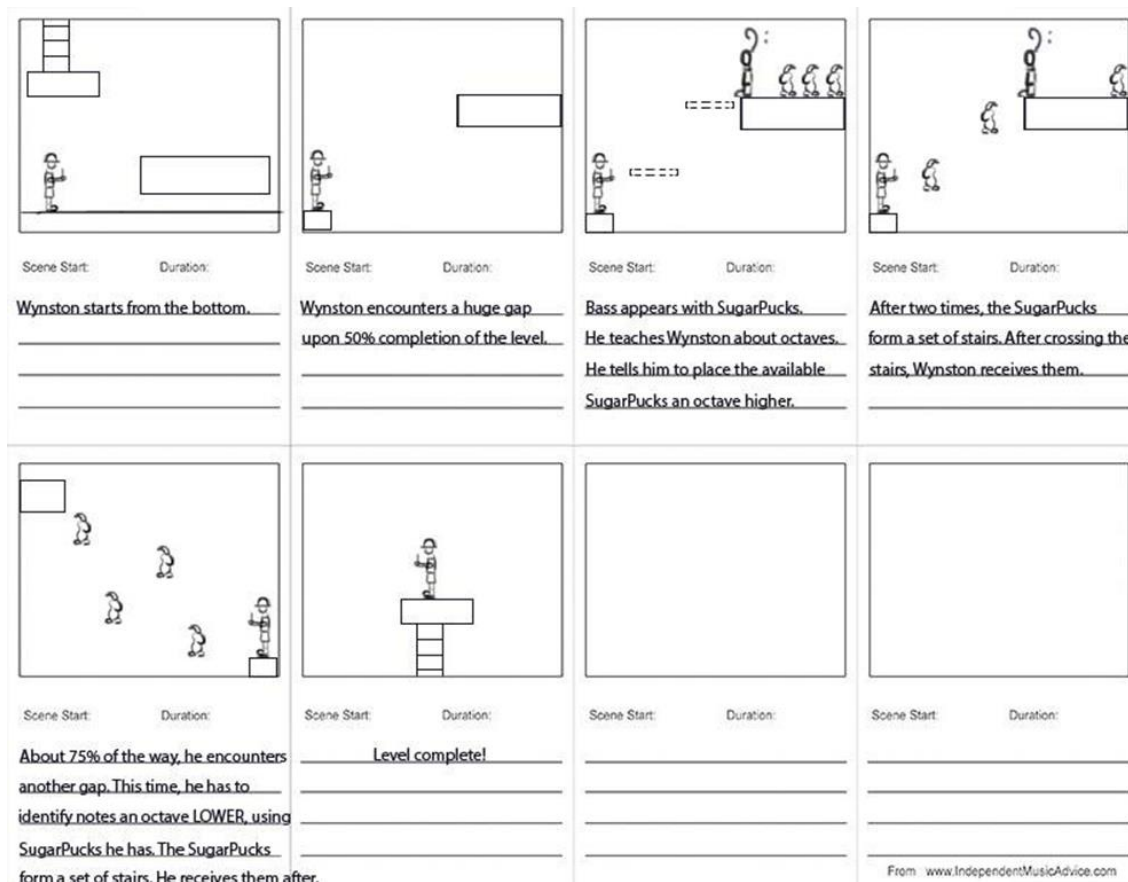Figure 1: Storyboard for the first level.

Figure 2: Storyboard for the second level.

5.1.4 Game Design Document

The last thing we needed to make was a game design document. This highly descriptive report provides a detailed explanation of all of the features of the game, including the concepts and storyboard. In addition, it had contained the description of the main characters and artwork of the background environments. We really wanted people to understand why we were doing this project, and the document would contribute greatly to making our goal as clear as possible.

In order to make the game design document, we had to revisit our objectives, and

also discussed a few ideas for the game such as the level design, additional characters, and the background story on why Winston came to Sugar Puck Island in the first place. With this idea, we could center the story on this and try to teach music concepts around Winston's conducting in the game.

The Sugar Puck went through several design changes, which were mostly based on its eyes and mouth locations on their body. We had to decide whether or not their mouths would be most of the bottom half of their face, resembling a beak. Its eyes had to be appealing to fit its small, cute appearance. We also had to decide on which Winston design we were going to go with and how fitting he would be in the game based on his appearance also.

5.2 Development

The goal of this stage was to focus on the development of our game. This part of the process could quickly get out of hand if organization were nonexistent. Therefore, an asset list was created in order to keep track of what needed to be done. We could now divide the workload and assign each member to work on one of four general categories: audio, art, animation, and programming

5.2.1 Audio Design

All of the audio for the game needed to sound bright and cheerful. We wanted the players to be comfortable with the tone and setting. We used Ableton Live to fulfill the requirements of having a digital audio workstation that is versatile. Any musical piece that required instruments, such as the background music, was composed with a MIDI keyboard and the software's built-in instrument packs. Voices, including the laughs and

grunts, were recorded with a microphone in an acoustically treated room. The rest of the sound effects, such as page turning and journal opening/closing, were made using online sound libraries, free of use.

5.2.2 Art Design

The initial concept of the Sugar Puck was the first thing that needed to be done for the artwork. Using Adobe Photoshop and Illustrator, we made the figure disproportional, meaning that certain physical features had to be larger than normal. These types of characteristics are used heavily in cartoons because they emphasize the tone and add to the appeal of the characters. We wanted the Sugar Puck to do the same.
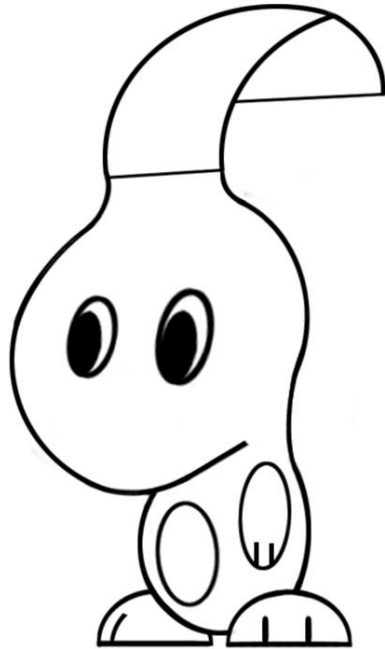

Figure 3: Initial Sugar Puck concept in 3/4 perspective.

The next objective was to create the game's environment. We wanted to carefully consider a setting that would be the most appropriate for the Sugar Puck. Using Photoshop, we made its habitat appear peaceful and colorful because we felt that this would also set a positive tone for the game.

The prototype also needed a main menu and pause menu screen. We just created a very simple design for both of them. For the main menu, we created a new background, and added the main characters to the foreground. The pause screen needed at least a play, home, restart, and volume button, so we made individual squares that represented these four buttons.
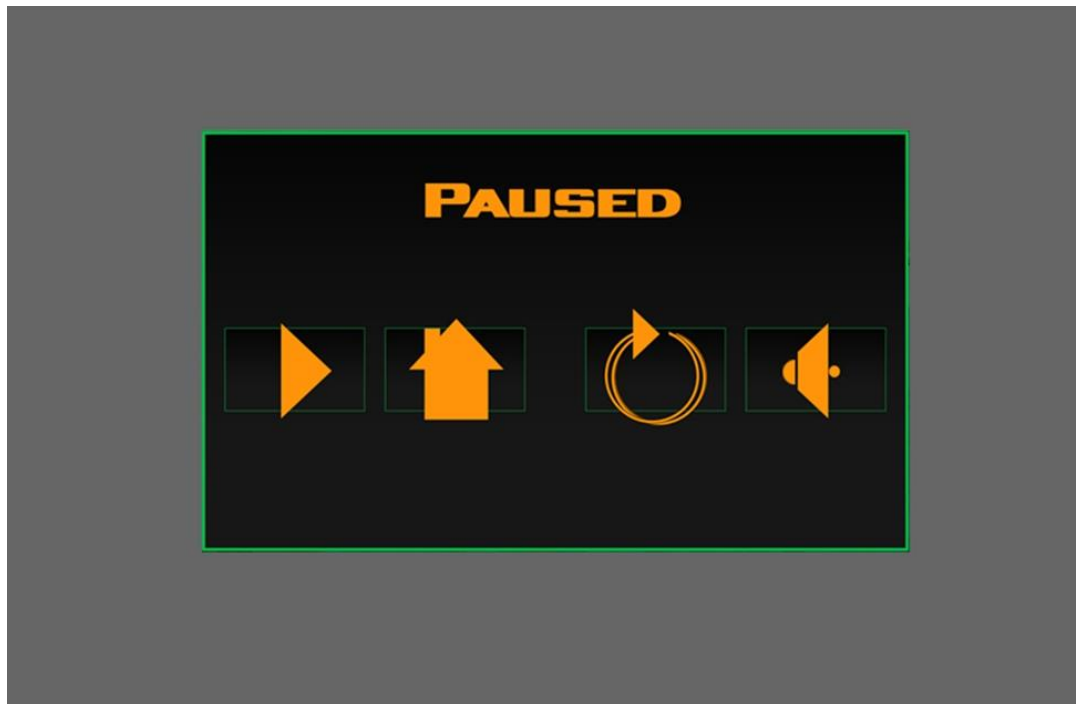

Figure 4: Basic pause menu with four buttons.

5.2.3 Animation Design

Our game had to feature simple, 2D animation. We felt that Adobe Flash was the best option possible when it came to working on the actions of the characters. It was easy to learn how everything operates, so it did not take long for us to dive right into animating the movements.

The final concept art for the Sugar Puck and the conductor was drawn in Adobe Flash first. The Sugar Pucks were exceptionally easy to animate based on its design. With these results, we decided to incorporate the actions for each character. The Sugar Puck is able to run, jump, and sing. The conductor has the ability to run, jump, and transform.

5.2.4 Script Design

Our design of the dialogue script had to be simple. The players needed to understand what is happening in the game, so we based all verbal communication off of the storyboards. The script explains the real reason why the conductor came to the island and his interaction with the instructor for the level's activity. We felt that the dialogues for these two parts provide enough information for the players to get a good grasp of the storyline.

5.2.5 Programming Design

The game had to be created in software that would be easy to use and required only minor programming experience. We decided to go with a game creator called *Construct 2*. All of the elements of the game were gathered together and implemented using this software. Placeholders were used in the editor as a template for later implementation of

the actual components. When they were completed, the temporary replacements were no longer needed. Our process of developing this game was showing good results, considering the amount of assets that were created and implemented into the game as well as the programming. The animation and sounds were working well, and we could progress to fully testing out the prototype.

5.2.6 Maintenance

It was time to test out the game and see how well it worked. We were satisfied for the most part, but there were some errors in the art and animation assets. The background had some seams in the image. That had to be reworked so that they would be seamlessly tiled. We also encountered issues with Wynston's animations, in which his eyes were transparent during the idle animation. We fixed this problem quickly by editing the faulty frames in Adobe Flash Professional CS6.

5.3 Testing

The objective of having players test out our game was so that we could discover ways to further improve the prototype. This part of the process was all planned out before, but realizing we had to find a different target audience changed our course of action.

5.3.1 New Audience

Our initial plan was to have one of our adviser's associates get her students play our game. We had sent her an email twice, but she never responded back to either of them.

We gave up on the prospect of younger testers and decided to find new people to play the game, as well as slightly change our overall objective.

Our testers needed to be concentrated in one area. That made it easier for us to get in contact with them. We quickly discovered that people from our own campus were willing to play test the prototype. We could gather the emails of people who are both musicians and non-musicians. Incorporating both sides will greatly help with improving the game.

5.3.2 Survey Design

We sent the email out, asking potential participants to play our game first and then fill out a short questionnaire. Question 1 of the survey asked whether the participant was a musician or not. Questions 2 through 9 focused on the testers' opinions of the game, rating features such as the graphics and controls. This survey can be found in Appendix B of this report. The purpose of asking these types of questions was so that we or potential future developers could analyze the accessibility of the game, and make the necessary improvements to our prototype. The fact that the testers are musicians and non-musicians was all the more beneficial for us, as we could see what could be done in order to cater to both sides.

6. Data Analysis

We received 32 responses out of the 108 emails that were sent out. We initially overlooked these results as a setback, but the responses made room for improvement and also helped in our analysis. Since our target audience consisted of both musicians and non-musicians, approximately 44% are the former and about 56% are the latter. Of the musician participants, 35% agreed that they would play an extended version of the game, while 50% of them were neutral on playing more of it and the remaining 15% would not. 61% of the non-musicians would play an extended version of the game while 22% would not. When we analyzed on how clear the concepts were to the non-musicians, 61% felt that the music concepts were clear, and 22% thought that they were not clear. 71% of the musicians thought that these concepts were clear to understand, drawing from the fact that they could see these ideas and knew what the game is trying to teach. Based on these results, the game was less effective on musicians, but could help non-musicians.

The majority of the testers agreed or strongly agreed with the statements mentioned in the survey. For example, 62% of the participants had fun playing the game and close to 97% of them thought that the controls were easy to use. 68% of the players felt as though the concepts were easy to understand, and 14% felt that that they were confusing. 68% of the players also found the game's graphics to be appealing, which helps the game attract players based on visuals.

The game could draw more attention if it was fun. The game's clarity in introducing music concepts made it more accessible and helpful to those unfamiliar with some music concepts, teaching them within a level in the game.

We gathered 24 open responses, with many of them telling us what needed to be

improved. One of the things that needed improvement were some of the game's way of preloading sounds for the Sugar Pucks as they may or may not play a sound correctly. Some players felt as though the game was not as clear in indicating when they were supposed to hit the done button or the Sugar Pucks. There were some glitches with the done button in the game not working correctly and also being in the way of some text, and the textbox is broken if the player completes the game once. Most of the responses mentioned that there were bugs in the game, and would need to be debugged into the programming. There were also responses wishing that the game was longer.

7. Conclusion

The original goal of our project was to be able to present basic musical concepts to non-musicians through fun and interactive gameplay. We knew that trying to create a full game would be highly improbable, so we lowered it to creating a prototype that has only one level. We wanted to include the second level as described in the storyboard, but we had problems with implementing activities for the second level as well as scripting.

A large portion of our project was spent creating the audio, art, and animation. We then implemented them into the game using *Construct 2*. A few changes and touch ups had to be made. For example, a couple of the animations had transparent areas that should have been covered in white. Our background for the first level was also edited slightly in order to make the background smooth and seamless. We were able to fix the majority of the issues, so that we could send out our prototype and survey.

Our target audience eventually changed, as well. Instead of targeting only people who were not very music oriented, we decided to have our game tested by both musicians and non-musicians from our school. This would allow us to quickly gather players and data.

For any future group who wishes to work on this project, we would suggest to make the game not feel like a tutorial level, as stated from one of our participant's comments in the survey. We learned that testing out the game ahead of time would be very beneficial before deploying the game. It should be tested at least three weeks in advance before sending out the game to be played. If you could include a few screenshots in whatever form you present, that would increase the chances of participants as they may be attracted by visuals. For any additional art and animation made for the game, check as soon as

possible to see whether or not it works inside of the game and if there are any fixes needed. We also would recommend implementing some audio fixes in terms of adjusting it whenever you have to listen to the Sugar Pucks and also an option to mute the sound. If anything, a pause menu would help with this.

In the end, we were able to create one working level for our prototype, with the feedback pointing out even more errors. We wanted to take action. However, there was simply not enough time to fix those issues and implement additional features into the game. That is why we hope that future students work on this game, so that it can be even better than it is now.

8. Bibliography

Bhatia, A. (2014, May 12). Active Learning Leads to Higher Grades and Fewer Failing Students in Science, Math, and Engineering. . Retrieved May 30, 2014, from http://www.wired.com/2014/05/empzeal-active-learning/

Good, O. (2009, March 16). What guitar hero and rock band can teach us. Retrieved April 30, 2014, from http://kotaku.com/5169203/what-guitar-hero-and-rock-band-can-teach-us

Kalning, K. (2009, February 10). Teachers invite 'Wii Music' into the classroom. Retrieved April 30, 2014, from http://www.nbcnews.com/id/29127548/ns/technology_and_science-games/t/teachers-invite-wii-music-classroom/

Heick, T. (2012, October 23). What Teachers Are Saying About Video Games In The Classroom.*TeachThought*. Retrieved April 30, 2014, from http://www.teachthought.com/video-games-2/video-games-in-the-classroom/

A. Game Design Document

Sugar Pucks: A Composer's Quest
Making music is as sweet as it sounds.

Team Chordscan

Mike Bohrer

Liam Miller

Tyree Robinson

Kenrick Tsang

Version 1

EXECUTIVE SUMMARY

The world of music is wide and wonderful. You might want to do more than just listen. However, learning music can seem intimidating. But never fear, because Wynston and the Sugar Pucks are here to make it fun and easy!

Sugar Pucks: A Composer's Quest will informally introduce musical concepts throughout the game that help develop and reinforce the skills of a budding or seasoned musician. In other words, the player does not need to know how to read sheet music or learn an excessive amount of terminology.

The reason why *Sugar Pucks* is made is to informally present musical concepts via video games. That means that anyone, musicians and non-musicians alike, are able to play this game.

For beginners, it gets them started on understanding how music works so that they can move forward to learning deeper concepts, such as formal theory or playing an instrument, with a comfortable amount of experience. It also helps them practice skills that will greatly help them in the long run, such as auditory note recognition.

For veterans, the concepts reinforce the material, which makes them easier to remember.

- Learn music concepts, such as tone recognition and octaves!
- Stunning 2D graphics!
- Beautiful environments and a colorful cast of characters!

VISION

Goal:

In today's society, video games are a major source of entertainment. Unfortunately, there are only a handful of games, let alone music games, that actually provide some sort of education to the public, compared to the many role-playing and first person shooters that are being created and sold constantly. So we decided it is time to deviate from that trend. Instead, we made a game that is going to teach musical concepts in an informal way. This game is called *Sugar Pucks: A Composer's Quest*.

Experience:

Made solely for the computer, the game will have a user interface that consists of the name of the character, number of points and Sugar Pucks, and the position and journal of the explorer.

While this is a game, its main purpose is to teach basic music concepts to anybody who is willing to learn, in addition to providing the usual features that are found in platformers, such as levels and points.

Throughout the level, the player will learn very basic music theory, while the background music for each level will be relevant to what he/she will be learning. Concepts, such as tone recognition and octaves, will be taught. After learning them, they will be included in the journal for future reference. In addition, the player can look inside the backpack to see the Sugar Pucks obtained.

ENVIRONMENT

With the environments in the game, we like to create a rich, fun, and creative experience for the player. Some of the levels showcased below, such as the meadow, and caves, will, in a sense, symbolize the structure of the game in terms of the musical concepts that will be taught.

(Above) Meadow level could be used to teach players about tone recognition.
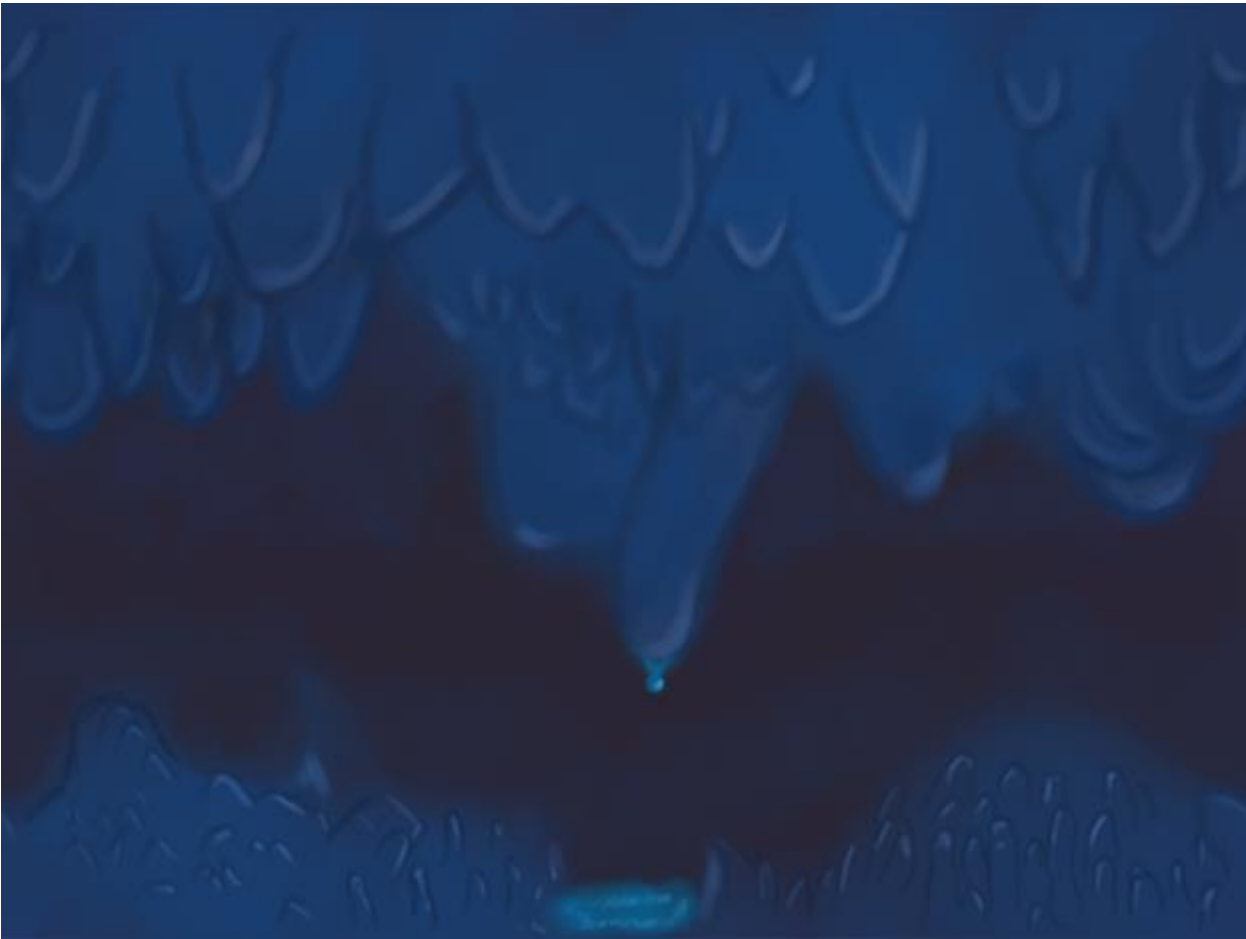
(Above) Cave level that teaches players about tone recognition/octaves

If you are familiar with side-scrolling games, such as Super Metroid or Super Mario World, you should remember that the environments placed an imprint on what atmospheric worlds should look like.

CHARACTERS

<u>Wynston Puck</u>

From humble beginnings, Wynston Puck was frustrated with his old life of being the typical conductor of an orchestra. After learning from a map that a mysterious island contains mystical musical notes and symbols, the maestro decided to set sail to discover the musical secrets that reside there. After some exploration, Wynston encountered the island's inhabitants that are known as Sugar Pucks. They possess the power to create the most beautiful sounds, and, when gathered together, the most profound music. With his musical intellect, conducting abilities and never-ending passion that is only matched by his curiosity to discover more, Wynston explores this new world. Along the way, he gathers Sugar Pucks and overcomes obstacles in an effort to conduct the best music in existence.

Sugar Pucks
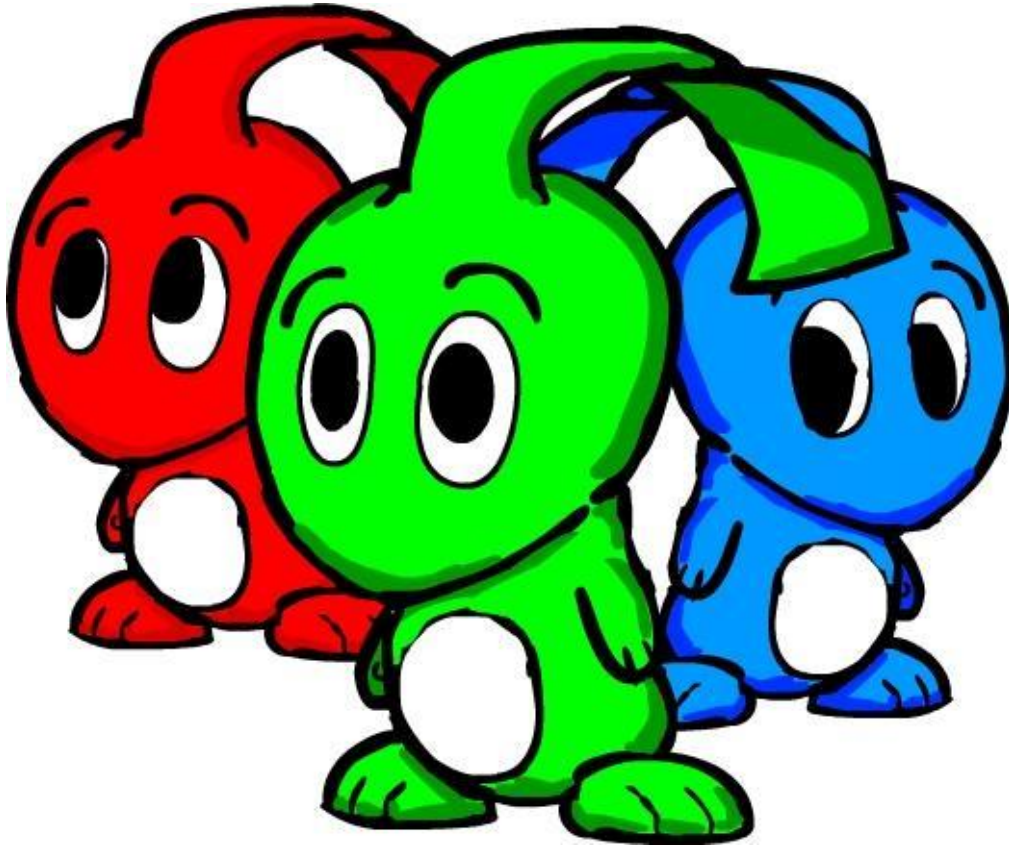
The mysterious Sugar Pucks are the native inhabitants of the island. Each one is a bright-colored small creature that has an enormous head, small stumpy arms, large three-toed feet, and a white belly. They all have the same leaf-like appendage that appears at the top of their head, which changes in size for different purposes. The Sugar Pucks are very musical, and each one can sing a single note perfectly. Working together, they can sing simple tunes or grand symphonies.

GAMEPLAY

Each level starts off with a segment of classic side-scrolling platforming. The player controls Wynston as he explores the environment of the level, such as the desert or the caves. He also has the opportunity to explore alternate routes that lead to secret items. The most obvious route forward will take the player to the next learning segment, where Treble or Bass will present the next concept for the player to learn. Each idea is taught through puzzles, which are structured to encourage the player to develop and use skills that the game intended to teach. We will try to implement these ideas into a future planning stage for the game.

In level 1, the player is learning about tone recognition from Treble. As he/she progresses closer to the end, a slab of rock blocks the path. It contains a single musical note, and the player must correctly match the corresponding Sugar Puck multiple times in order to remove the slab.

In level 2, when Bass is teaching the player about octaves, he/she must match a note to its counterpart one octave higher or lower. This is presented in a puzzle where the player is confronted with a chasm. Wynston is standing on a low platform, while a high platform, separated from him both vertically and horizontally, is shown to be the way to progress forward. In between the platforms are slots outlined against the background wall, which cannot hold Wynston, but can hold Sugar Pucks. Each slot glows and plays a note. Sugar Pucks standing on the high platform each play a corresponding note, but of a different octave. The player must match the Pucks to the slots, after which each Puck's head leaf will grow into a platform upon which Wynston can stand, allowing him to reach the high platform and continue forward.

VERSION

There will be only one version of the game:

Windows Version:

This will be downloadable and executable on home computers. Resolution will be standard 4:3, and will have multiple options to fit different screen resolutions. Control schemes will include options for both keyboard & mouse arrangements and USB gamepad arrangements, and will also have in-game options to reconfigure the controls.

ACCESSIBILITY

A crucial trait that will be kept in mind during the design & development process is accessibility. Accessibility is the key to the massive success of more famous mobile games, such as *Angry Birds* and *Fruit Ninja*, and is shown to have a very positive impact on popularity not just in gaming, but in all commercial fields, as well.

The main thing that makes a mobile game accessible is the quick pick-up, put-down nature of the game. The aforementioned mobile games are accessible not just because they're cheap and downloadable, but because they're designed such that a person can pick up their device at any given time, start up the game, play for a few minutes, and put it back down in a moment's notice -- and keep most of the progress they made. They are able to do this because the gameplay is divided into short segments that, while connected to each other, can easily be played independently from each other. This methodology cannot be used for the lessons in *Sugar Pucks*, so a different framework will be implemented to support essentially the same effect.

PRODUCTION

Sugar Pucks is being developed using Construct 2, for ease of development. It will make use of sprite sheets, simple scripting, and horizontally re-orchestrated music.

Character and world concepts are drawn as scalable vector graphics using Adobe Creative Suite programs to make it easier to create the rasterized game asset versions.
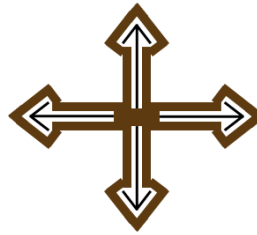
The music and the more musical sound effects are composed using Ableton Live to provide consistency with each note, which is vital to many aspects of the learning process, particularly note recognition.
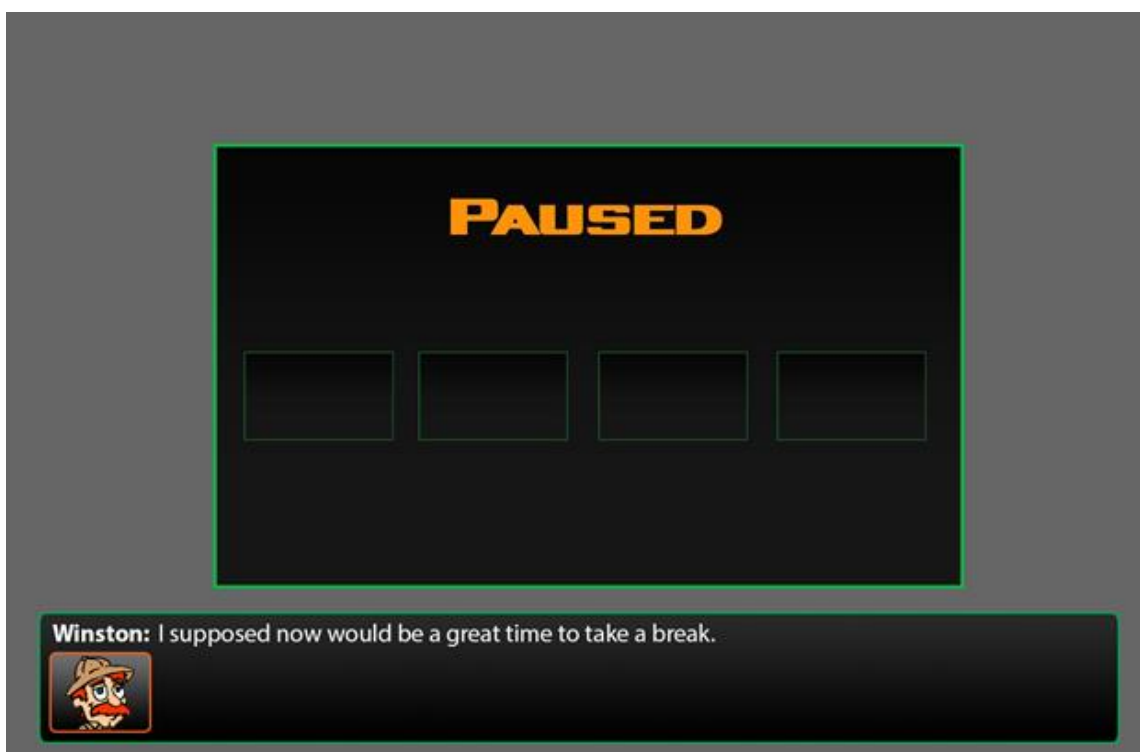
ARTWORK

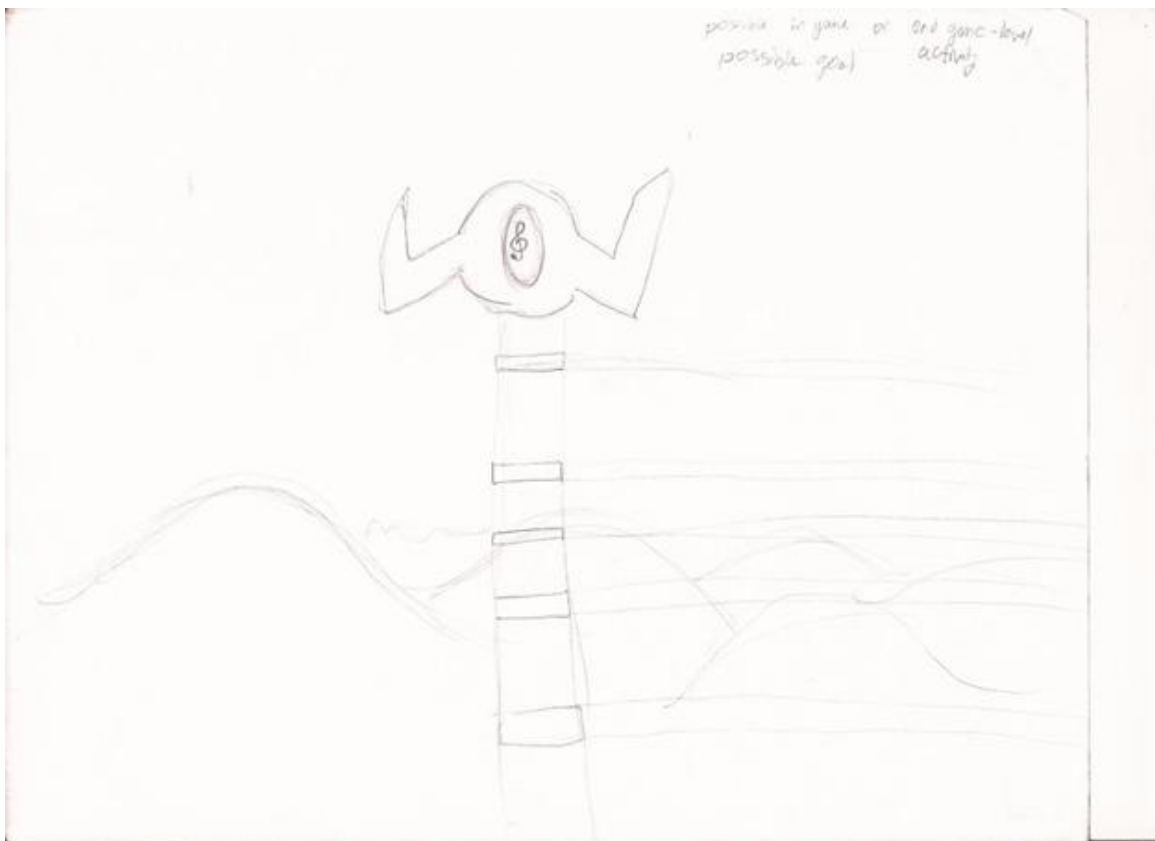Winston: I supposed now would be a great time to take a break.

Main characters
explorer → conductor

rock puck

band puck

cowboy puck

acustic

techno

Teachers → elder sugar puck

obstacle

obstacle

Big!

example level

possible in game or end game-level
possible goal   activity

023

Sugurpuck
count

life bar

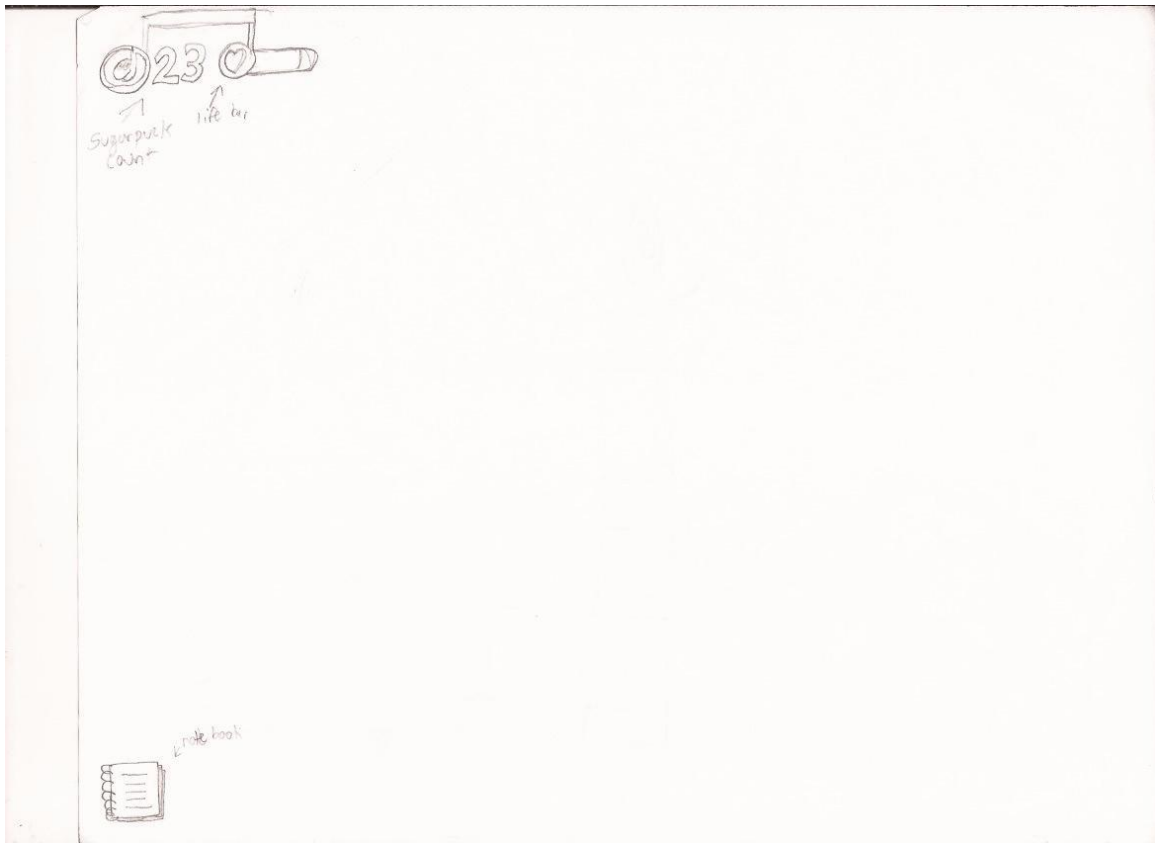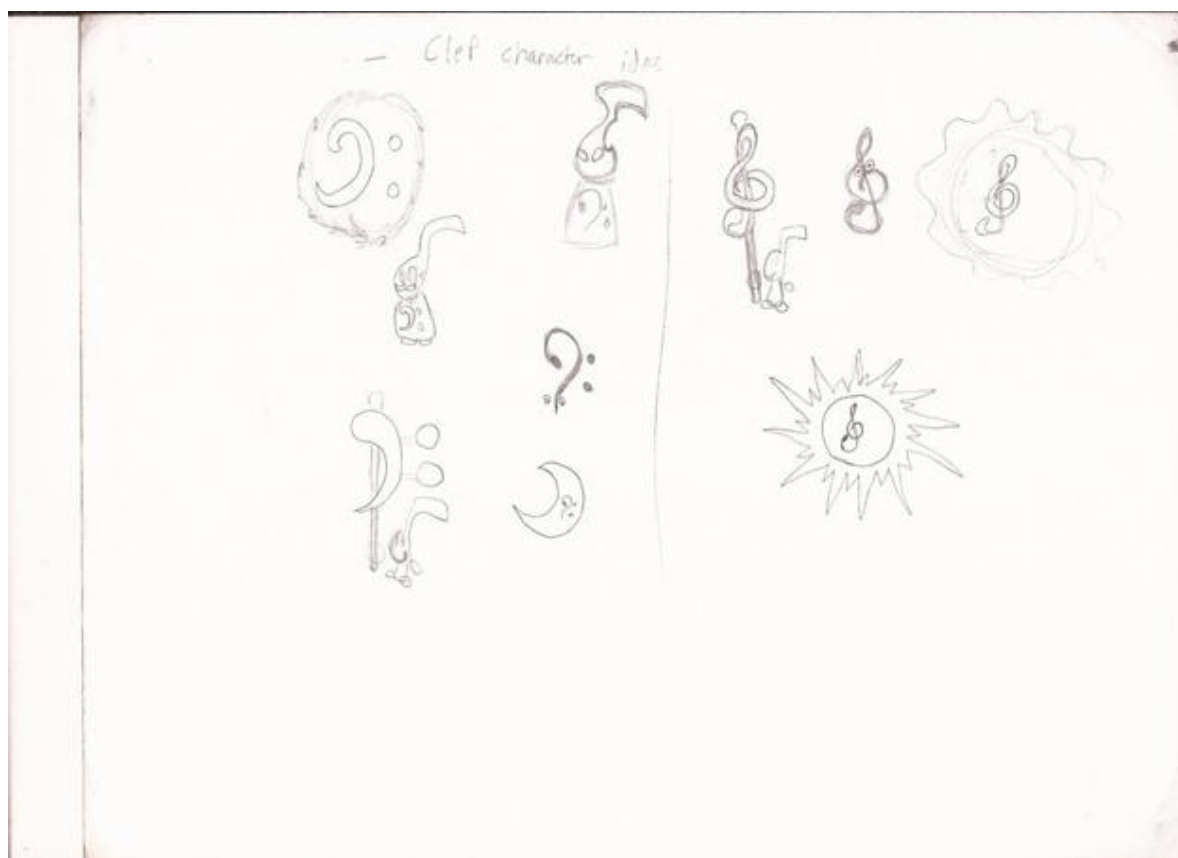note book

Player Character

Colorless
SP???

— Clef character ideas
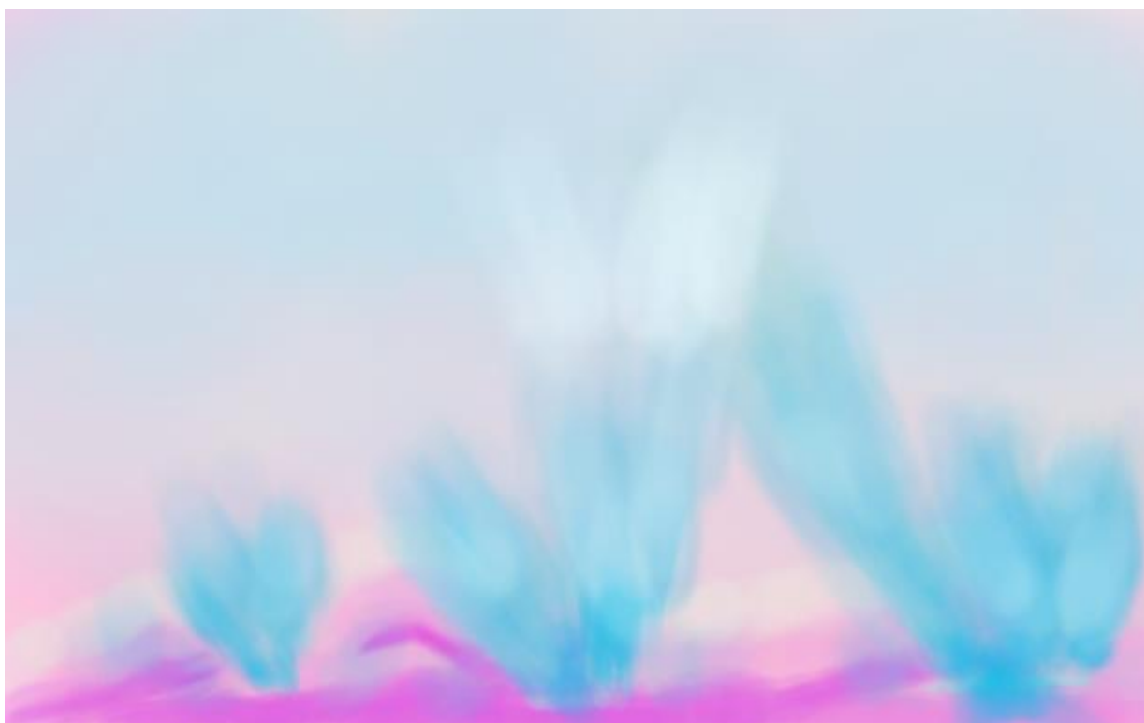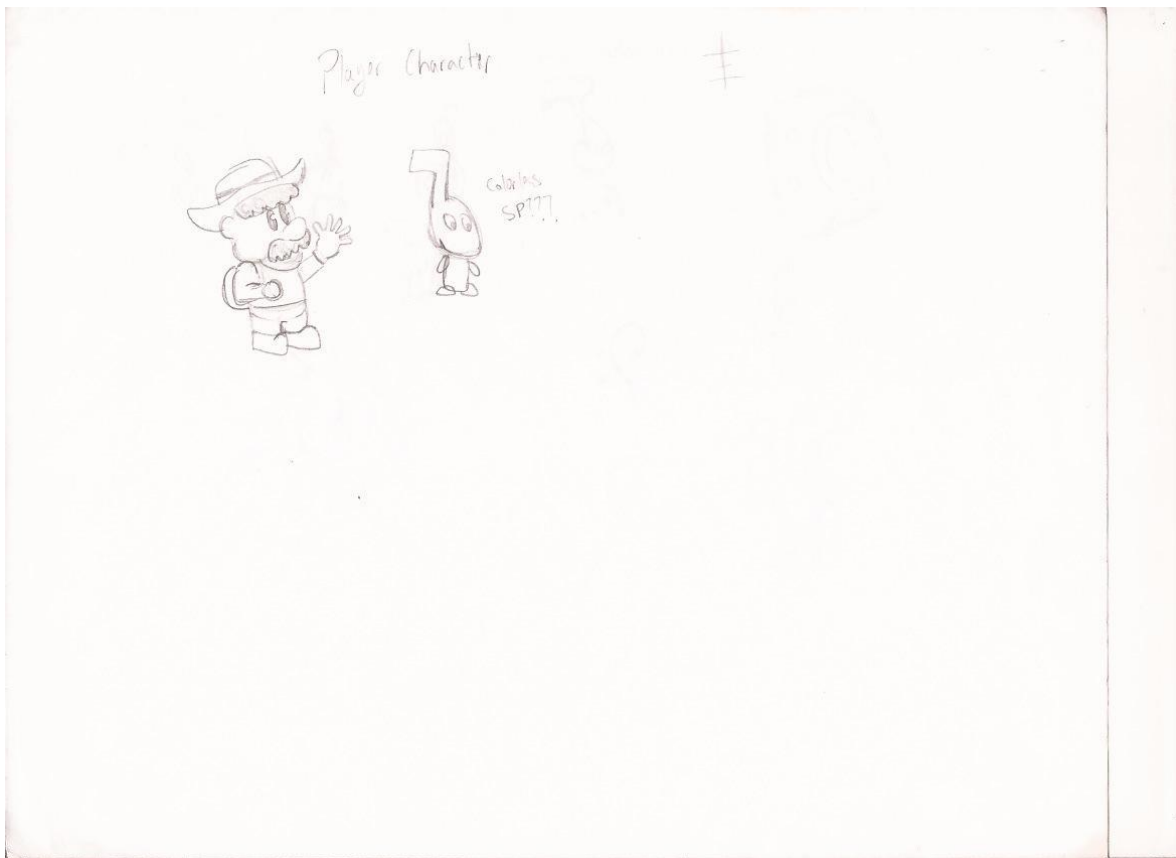
B. Survey Questions

1.) I am a musician.

2.) The controls were easy to use.

3.) I found the game graphics to be visually appealing.

4.) I understood how to operate the game without the hints.

5.) I felt the musical concepts were presented clearly in a manner that was easy to

understand.

6.) I had fun playing this game.

7.) The challenges were at a reasonable difficulty level.

8.) I would play an expanded version of this game.

9.) Please provide any other comments that you may have regarding this game.