MSPainter+
Detailed Design Document

A Puzzle Platform Painter Game

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CORE OVERVIEW

SUMMARY

MSPainter+ is a puzzle platformer for the PC that challenges players to reach the exit by using materials available to them and "vandalizing" the level. Use various materials to overcome obstacles before the janitor cleans up your mess!

MSPainter+ is a simplistic side view puzzle platformer with a humorous side as the player tries to outsmart the janitor by drawing platforms and using other materials to try to get to the exit before the janitor can clean it up.

The game follows a concept such that N+ meets Crayon Physics inside of Microsoft Paint.

KEY ASPECTS

- Use materials to interact with and create objects within the environment
- Create platforms to navigate through levels to the exit
- Move fast and work against the janitor
- Use various school supplies to overcome challenges
- Puzzles that challenge players to think before acting

GOLDEN NUGGETS

This game is unique because it takes elements from similar games and combines them into an innovative, fun experience. Players navigate through levels composed of platforms, many of which are drawn by the player themselves. In addition to platforms, other materials such as paint and glue can be used to create new gameplay experiences. Additionally, there is an "enemy" character (the janitor) that erases the materials that the player puts into the level, creating additional challenge.

GAME CONTEXT

GAME STORY

MSPainter+ follows the character of a student who likes to give the janitorial staff a hard time. To ease his boredom, he uses various found school supplies to find his way to the exit while irritating the janitor on the way by drawing all over the levels in paint, pencil, glue, and other things found in the school. The student must make his way through the various rooms of the school to achieve freedom and get a passing grade without getting suspended.

BACK STORY

A student was sitting in class one day and decided it was a waste of time, so he tried to leave. On his way out, he realized that his school had turned into a labyrinth of sorts with traps, ledges, and a sudden lack of stairs. Being resourceful, he grabs as many supplies as he can and creates his own path through the treacherous layers of doom that was once his school.

PRIMARY PLAYER

 The player character is a generic if not rebellious student in high school who is bored with class and wants to leave. He is resourceful and can use simple school supplies to make a path through various obstacles.

CORE GAME OBJECTS

CHARACTERS

THE STUDENT

- The main character, who the player controls
- Does not like class
- Can use school supplies to make platforms, alter surfaces, and create distractions.
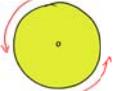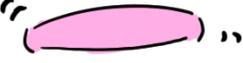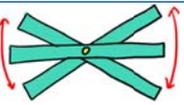- Likes to annoy the Janitor

JANITOR JIM

- Keeps the school constantly clean
- Erases and cleans up messes created by the student
- Is enabled or disabled at the beginning of the level (for easy and hard difficulties)
- His broom has yet to find a mess that could not be cleaned

STRUCTURES

These are the game objects present in MSPainter+.

Picture	Item	Description
	Generic platform	Normal fixed platforms or walls. No special attributes.
	Spinning Platform	A round object that spins. Players can run on top of it or stick onto it with glue to reach areas.
	Spikes	The player will die if they come into contact with them.
	Bouncy platforms	The player can bounce on them to get to higher areas. The bouncy platform may also become an obstacle and bounce the player into a difficult or deadly situation.
	Air Vents	The air vents blow out air that push the player away from them. These may be useful to the player to reach an area or they may work against the player by slowing them down or blowing them into obstacles
	Pivot platforms	Platforms that pivot on a central axis. The player must balance when using these. Additionally, the player may use strategies such as blocking it on one end and covering the surface with paint to create a speed ramp.

MATERIALS

The player will acquire basic materials at the start of the level. In addition to drawing platforms, materials such as the pencil and pen can also draw walls to block moving obstacles or impede the janitor. Each level will begin with a different amount (if any at all) of each item available for the player complete the level.

Picture	Item	Description
	Pencil	A weak platform that can only be used once before it breaks
	Pen	A solid platform that does not break
	Glue	Can be spread on a surface and allow the character to stick to the surface. When jumping from it, the character only jumps half the normal jumping distance
	Eraser	Enables the player to erase anything they have drawn in the level
	Paint	Makes a surface slippery to allow more speed. Can be used to get more momentum for better jumps

CONFLICT AND RESOLUTION

Players are put into the level at a starting position and must make their way through the obstacles in the level to the exit. They must use the materials in their inventory to overcome them. Examples include:

- Using pen or pencil to make a platform to jump on
- Gluing a moving surface to reach another area
- Drawing a wall to block oncoming hazards

Players must move quickly and strategically to avoid the janitor cleaning up their markings on the level. Thus, the player must be quick to move or he will have to start again, think of another way to finish the level, or run out of materials. Once the material is cleaned up, the player cannot use it again. This requires the player to put some thought into where they use their materials, as they are limited. The only supplies available to the player are those that are given to them at the beginning of each level. If the player runs out of materials and has not reached the exit, they must restart the level via the drop down menu.

ARTIFICIAL INTELLIGENCE

The janitor NPC appears at random time intervals for each level. The obstacles of the game and the player's markings do not affect him, as he is on a layer in front of the level. He appears at the right of the screen, walks to the left and grabs his ladder. The ladder spans the entire height of the level. He then climbs to a random height and erases all player made markings across the screen horizontally at that height. The player must either move quickly to beat the janitor or create platforms and other markings generously to ensure their safety.

GAME FLOW

MSPainter+ is played from a side view and uses the mouse and keyboard for controls.

USER INTERFACE
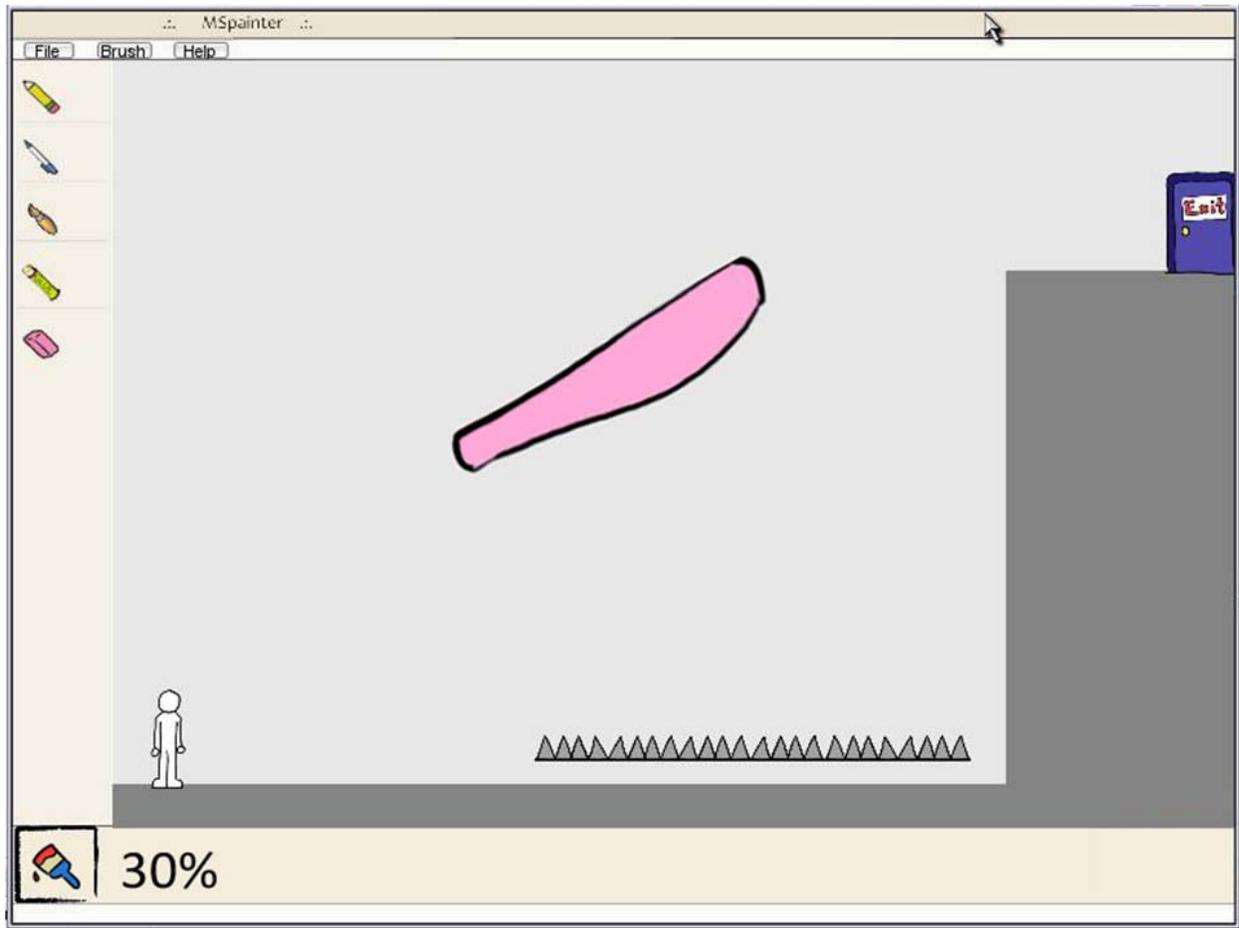
Item	Description
Top Bar	Inside of this header is the game title, MSPainter+, and a minimize, exit and maximize tab to give a paint program type GUI.
File Bar	Different drop down menus much like in a paint program. (Drop Down menus shown below)
Left Side	This menu holds our 5 different brush types. If a brush is not allowed for a level, the percentage will be 0%. The percentage remaining is the amount of ink/paint/etc remaining. When this runs out if you are unable to reach the goal the player must reset (from the file menu).
Bottom Menu	This menu shows in a bolded box the current brush, a large percent remaining for the current brush.

GAME WINDOW

 In the example level in the screenshot above, the player starts at the bottom. Once the level begins the player would need to draw platforms to get to the exit. There is not enough paint given to go over top of the bouncy platform, so they are forced to go underneath. The player must take care in this, as a miscalculated jump would cause them to be forced into the spikes by the bouncy platform. After navigating across the spikes and up to the top platform, they approach the EXIT and end the level.

DROP DOWN MENUS

FILE MENU

Restart Room

Select Room

Resume

Leave Room

Drop Out
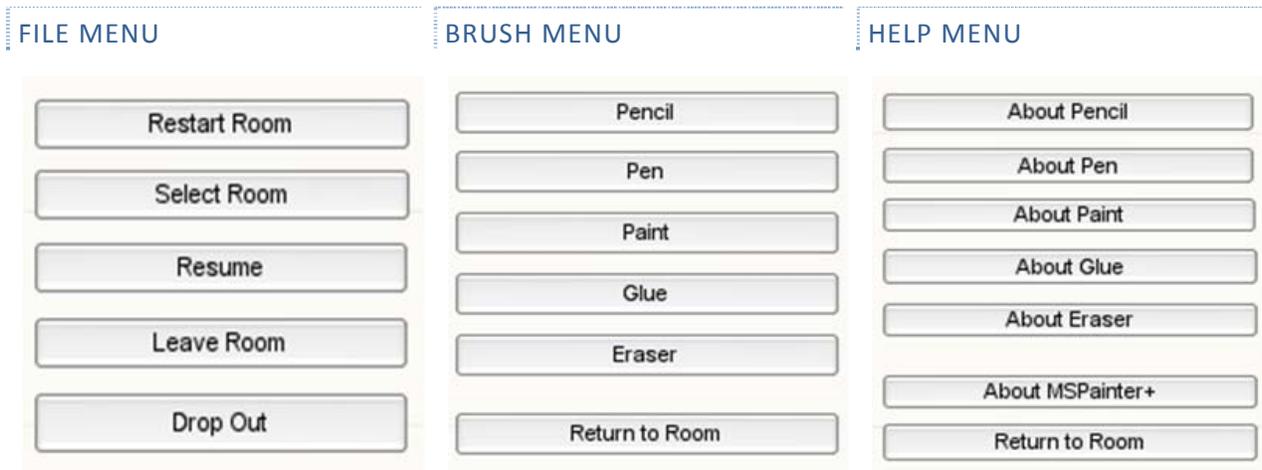
Allows the player to restart the current level, select a different level, resume the game, leave the level to the main menu, and exit the game.

BRUSH MENU

Pencil

Pen

Paint

Glue

Eraser

Return to Room

The brush menu is yet another way that the player can select which material they would like to use.

HELP MENU

About Pencil

About Pen

About Paint

About Glue

About Eraser

About MSPainter+

Return to Room

Displays an explanation and gameplay tips for each material that the player can use. There is also an option to display the credit page.

CONTROLS

The player interacts with the game by making the character run and jump. Additionally, the player can use materials, such as drawing a platform or applying glue (see chart in the "Objects" section). The controls are:

Control	Effect
W	Jump
A	Move left
D	Move right
Mouse left click	Draw with/use selected material, select material from the GUI, use drop down menus
Right click	Cycles through materials

GAME TYPES

GAMEPLAY

Levels are completed when the player reaches the exit. The game is completed when the player unlocks and completes all the levels. Unlocked levels can be selected from the level select screen from the main menu or in-game from a drop down menu.

MSPainter+ is a single player game the difficulty settings are selected at the beginning of play by the player.
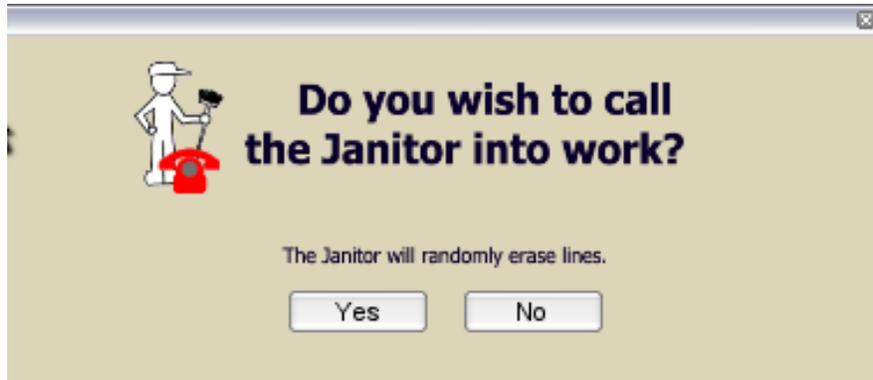
JANITOR DISABLED

This is the easy difficulty. With the janitor disabled, he will not appear in the level and will not erase the player's markings. The player can take as long as they want to complete the level.

JANITOR ENABLED

This is the hard difficulty. When the janitor is enabled, he will appear at random intervals during the level and will erase all player markings across the screen at a randomly chosen height.

EFFECTS OF THE JANITOR ON THE PLAYER

The Janitor is what adds additional challenge to MSPainter+. The player uses a combination of strategy, being quick, and luck to avoid having their markings cleaned. When the player sees the Janitor walk across the screen, it puts them on edge in anticipation of him cleaning. Since the janitor's level of cleaning is randomly chosen each time he appears. This adds fun to the game, as the player watches and tries to hurry up or avoid him as he strolls across the screen, grabs his ladder, climbs up and then cleans.

GAME THEME

The theme of MSPainter+ is a puzzle platformer inside of a paint program. The story's theme within this is that of the player in public school. The main character controlled by the player is a student that likes to draw. When the player draws their platforms and uses other materials in the level, it represents the student doing graffiti on school property. The Janitor is a character who keeps the school (levels) immaculate and cleans the student's graffiti.

The GUI is a major contributor to the school theme, as all the menus, help screens, and end of level screens have sticky notes, lined paper, suspension slips, graded papers, and pictures of the school. The credits page can be reached by clicking "Staff Room" from the main menu and the player is taken to a page that mimics a school year book. Each member of the team also has a title that relates to what they contributed to the program. The Janitor is included here, and he signed with a message to the player that adds some character development.

AUDIENCE

MSPainter+ is also targeted towards casual players. Casual games are very popular currently and attract many audiences. They appear everywhere: online (i.e. Facebook), home consoles, phones, music players, and other portable devices. Our team believes that MSPainter+ would be successful on platforms such as the Nintendo Wii, Nintendo DS, iPhone, and also PC or web based. These platforms are popular among casual markets, which are growing constantly. On the Wii, DS, and iPhone especially, our game would be fun to play with the Wii remote motion sensors and the stylus and touch screens that are becoming increasingly popular for casual games and those who play them.
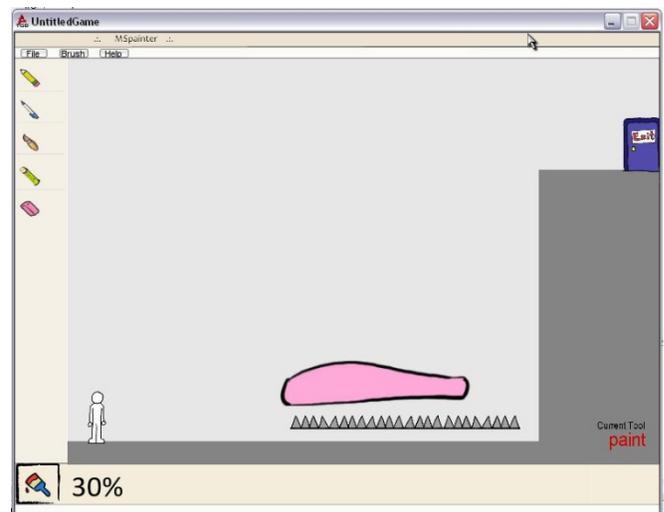
DESIGN GOALS

There were many goals that our team had when creating MSPainter+. The most basic of this was the ability for the player to draw their own platforms. From this original concept stemmed the idea that the player could use other materials, place them into the level, interact with them, and use them to complete levels. Originally the game was intended to be only a platformer. However, when we started coming up with ideas of adding more materials that the player could use, we thought the player should use strategy when choosing which material to use, where to use it, and how it can be used to accomplish their goal. Thus, MSPainter+ became a puzzle platformer, where the levels presented to the character would include obstacles and a layout such that the player would be required to strategy and thought in order to finish the levels.

FEATURES

Our team had many features that we wanted to include in MSPainter+. They were (listed by priority):

1. Platformer controls and layout
2. Allow the player to draw their own platforms
3. An element of challenge
    i. Limited supplies
    ii. A limited range around the character in which the player can use materials
    iii. Janitor "enemy"
    iv. Extra materials that can be acquired within levels by finding secret areas or reaching challenging areas
4. A variety of materials that each have different properties, each with benefits drawbacks
    i. Pencil
    ii. Pen
    iii. Paint
    iv. Glue
    v. Eraser
    vi. Rubber bands
    vii. "Weapons"
        • Chalkboard eraser
        • Paper airplanes/crumpled paper
5. Different game obstacles that are fun to interact with
    i. Regular platform
    ii. Spikes of death
    iii. Rotating platform
    iv. Bounce platform
    v. Pivot platform
    vi. Conveyor belt platform
    vii. Fan object that blows air and moves the player

Most of the features that we wanted to include are included in the final game. The ones that were not included were left out mostly due to time constraints. The feature of extra materials that can be collected within the levels was left out, just because there wasn't enough time to create it. The rubber band feature was left out because of the time restraints and because it would perhaps make levels too easy for players; a material like that would be unnecessary. The weapons were left out for two main reasons. There wasn't enough time, and the AI for the janitor was changed almost entirely from the original idea, and using those didn't make much sense. Finally, we could not include the conveyor platform since it would be too difficult to program within the time we had remaining. Additionally, the conveyor belt does not fit into the school theme very well, and would too much of an "industrial" feel, which is not desired in our game.

OVERALL GOAL

In the end, the majority of our original ideas were incorporated as features in MSPainter+. Our team has successfully kept to the theme and original concept of a "create-your-own" puzzle platformer, with a high level of interactivity and immersion created by the main feature of the player drawing their own in game features.

DEFINITIONS

Materials: refers to all available school supplies/items available to the player. See chart in the "Objects" section.

Markings: refers to the ink from the pen, paint from the paintbrush, etc. that the player draws in the level.
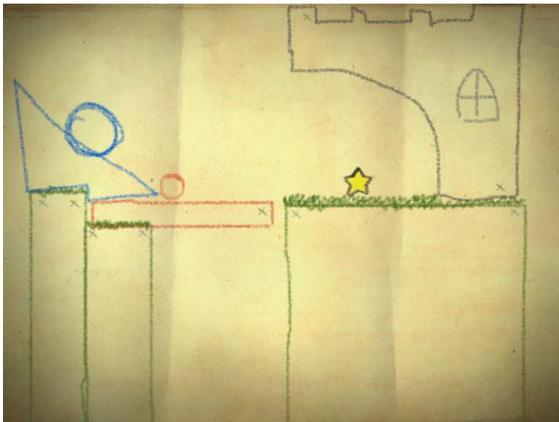
REFERENCES

INFLUENCES

This game was inspired by various other puzzle games and platformer games. Most notably are:

Crayon Physics

http://www.crayonphysics.com/

From this game, we took the feature where the player draws and creates things that are usable in game. In Crayon Physics, the player creates shapes, hinges, and mounting points to lead a ball to the star. In MSPainter+, the player draws platforms and uses other materials as game objects.
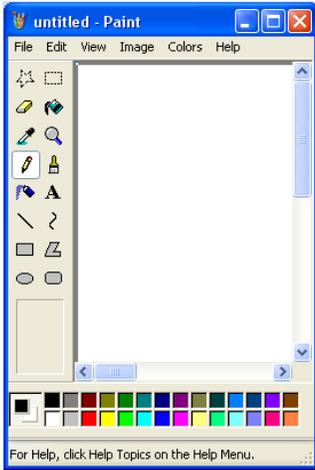
N+

http://www.thewayoftheninja.org/

In N+, the player is a ninja-like character and navigates various levels with many different obstacles to reach an exit. MSPainter+ borrows the concept of the player overcoming different obstacles to reach the exit in each level.
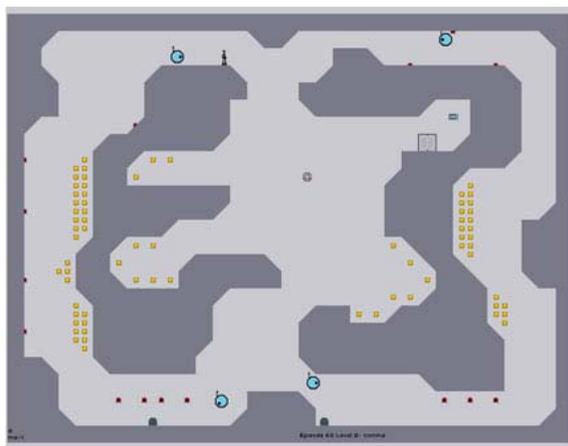
MICROSOFT PAINT

A simple painting program included with all Microsoft operating systems.

Microsoft Paint is not a game, but MSPainter+ uses the layout as the GUI. The game aims to give the player the same feel as the familiar painting program, but instead of painting images, they play a game with similar tools.
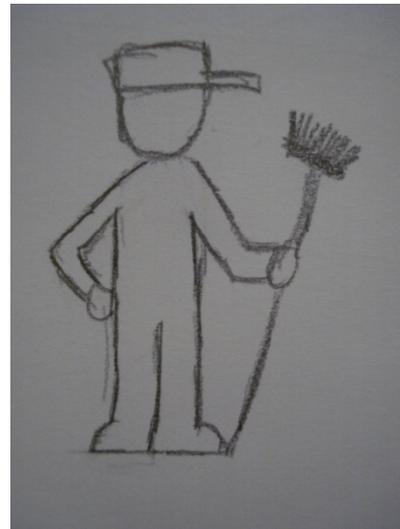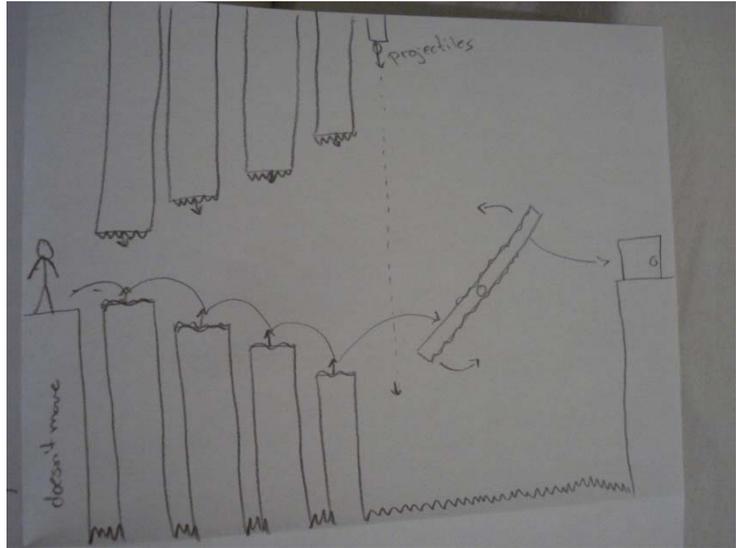
CONCEPT ART

ORIGINAL SKETCHES

PLAYER SKETCH

JANITOR SKETCH

JANITOR SCRUBBING SKETCH

LEVEL DESIGN SKETCH

DIGITAL CONCEPTS
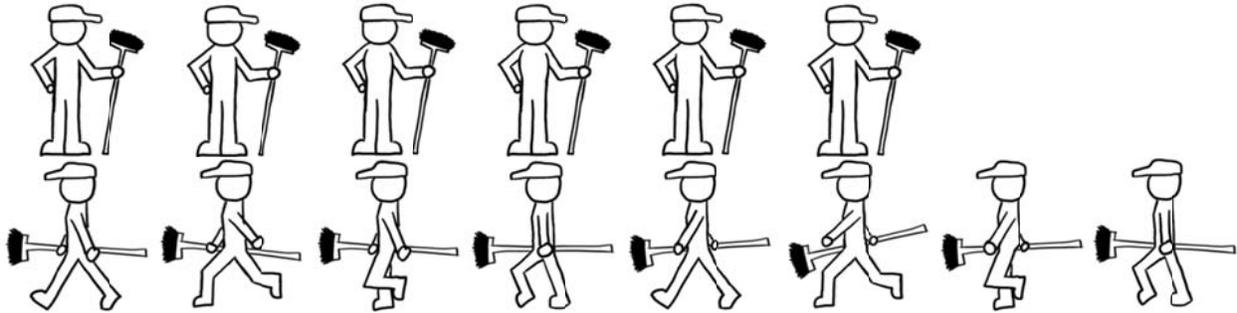
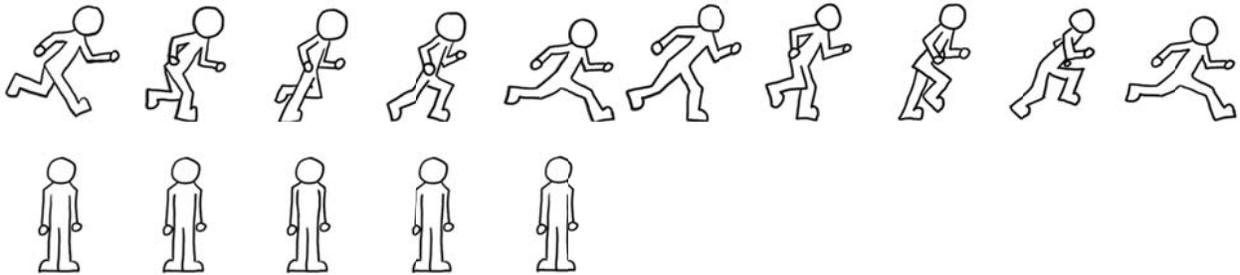## PLAYER CHARACTER

JANITOR JIM

EXAMPLES OF FINAL IN GAME ART
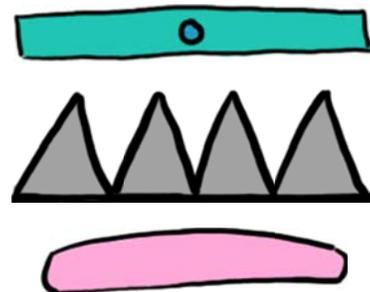
JANITOR JIM

THE STUDENT

GAME OBJECTS

CURSORS
OBSTACLES

BALANCE STRATEGIES

Our game uses various balance strategies to make it challenging and fun to play. The game has two difficulty settings as described under the "Game Types" section. Additionally, interest is kept by presenting increasingly challenging levels as the player progresses through the game. Easier levels will have simple obstacles and less challenging tasks to reach the exit. As the player progresses, they will encounter more dangerous levels that may include air vents that blow the player into spikes or bouncy platforms on the ceiling that force players into difficult to get out of places. Although there is almost no learning curve to our game, our game will keep players entertained with these strategies as they build their skill in playing and complete the game.

DESCRIPTION OF PLAYTESTING SESSIONS

When making levels for MSPainter+, each level was tested multiple times after creation. Variables were tweaked and adjustments were made to ensure each level was playable and offered challenge to the audience.

TUNING AND PLAYTESTING METHODS

While designing levels for MSPainter+, our team made sure to carefully play test each one. The goals for each level were:

- PLAYABILITY – can the level be played through and finished?
- TWEAKING OF GAME OBJECTS – how much force should the objects exert when interacted with?
- AMOUNT OF MATERIALS – how much of each material should be given to the player at the beginning of each level? What is the minimum? How much extra should be included (if any)?
- EASE OF MOVEMENT – How well can the player progress through the level? Do bugs occur if objects are placed too closely together?
- CAN THE PLAYER "CHEAT?" – is there one or more ways to complete the level? Should this be prevented or left in?
- HOW CAN THE LEVEL BE IMPROVED? – can the level be made more fun by adding something? By removing something? By making something a little bigger or smaller? Can alternate solutions be added for a different level of challenge?
- LEVEL DIFFICULTY – Is this level too easy? Too difficult? How can it be balanced to make it fun yet challenging?

By keeping all these factors in mind, our team believes that the levels created would be fun for the audience to play. Additionally, many people find painter programs fun, and Microsoft Paint is often a choice. In this way, a cultural aspect was incorporated to our game with the widely known and used painting program.

Due to the nature of our game, it was quite simple to create a non digital prototype for it. It was as simple as drawing the levels out on a paper and using different colored markers, pencils and pens to represent the various materials included in our game. We estimated how high the player could jump, how much 10% of an item was, etc. when doing the prototype play testing, since it is difficult to have an accurate quantitative reading of how much of the material was "used."
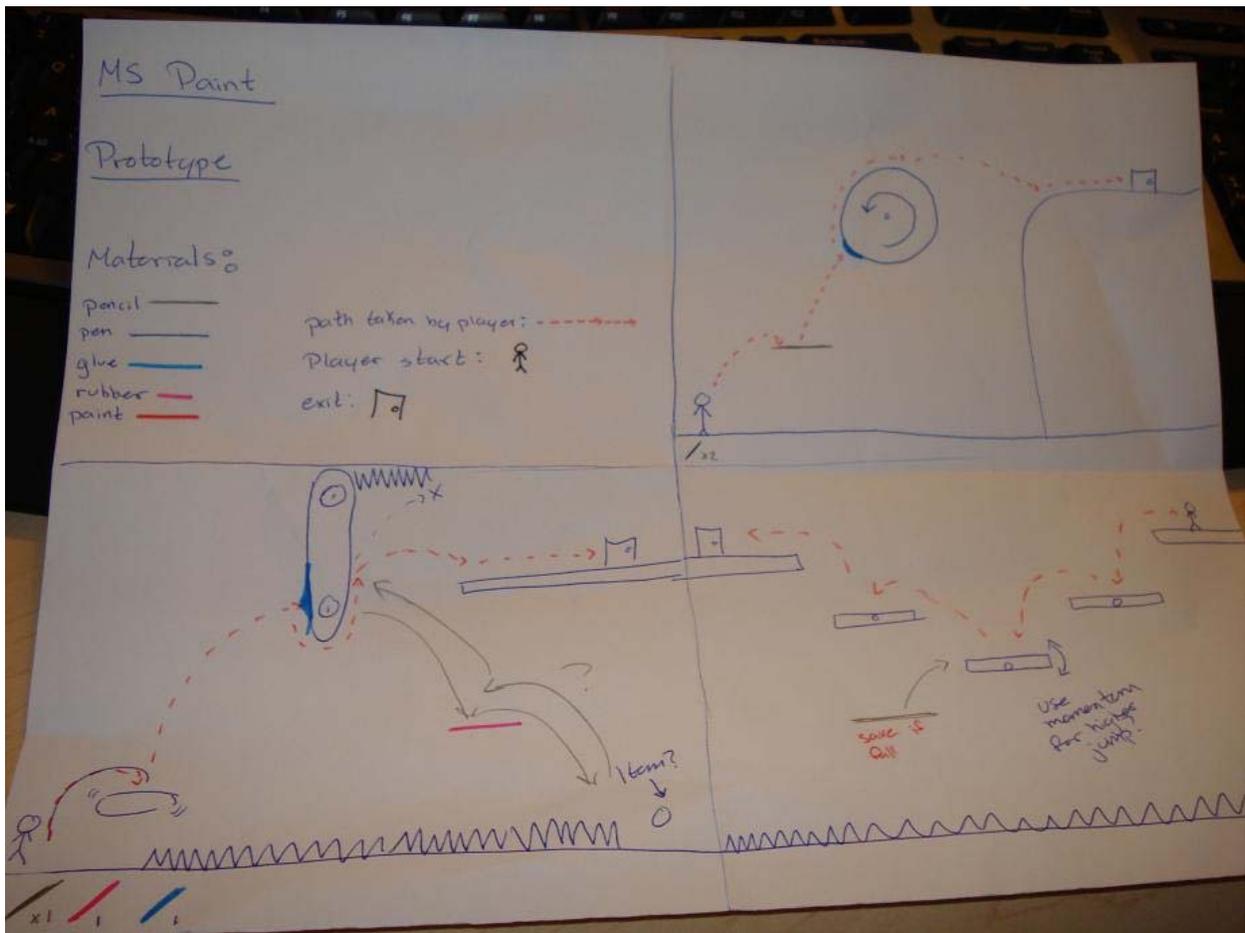
This is an example of one of our play testing sessions using the physical prototype. The stick man represents the start of the level and the door represents the exit, and the dotted red line represents a possible path the player could take.

Because of the style of our game, it was unnecessary to create a more elaborate physical prototype. Our game aims to mimic a painter program which mimics real world supplies (pencil, paintbrush, etc.) and because of that it makes a lot of sense to simply use real world physical materials that the program was designed to represent such as markers, pens and pencils.