

# Video Game Design

## “Polar Shift”

Highland Springs, Virginia

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Team Identification Number:

22165-1

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## **Game Purpose and Description**

The purpose of this game is to provide kids with a simplistic yet entertaining and intuitive two-player game that also stimulates teamwork and problem-solving skills in a theme of winter fun. The rudimentary controls make the game easy to understand and learn how to play, making it appealing to children. As the game progresses, players face increasingly difficult challenges that, thanks to the basic controls, encourage critical thinking as players need to think outside of the box to manipulate the controls correctly, as well as coordinate with each other. Within this game, each player must be considerate of the other player's position in each of the courses for every level in order to progress through and overcome each of the levels. From the dangers of spikes and winds aiming to blow you backward to the jump pads for greater complexity, players must be strategic and communicate well in this two-player game to navigate obstacles and reach the end goal together.

## **Target Audience**

The target audience of this game is younger kids, specifically those aged 8-13. This is because while the game is simplistic in nature and easy to learn, the different challenges faced by the players require a level of critical thinking that keeps older players engaged. The cooperative aspect of the game encourages social interaction and teamwork, which makes it a great choice for kids in this age range who are developing their communication and critical thinking skills. There is a clear balance between simple mechanics and increasingly complex challenges that helps the users stay engaged without being too overwhelmed. While younger kids may be able to play the game, kids mostly aged between 8 and 13 will best be able to comprehend and think their way through the different challenging levels of a winter adventure.

## **Explanation of How to Play the Game:**

As mentioned earlier, the game's controls are relatively simple. There are 3 levels that progress in difficulty, with each one introducing a new mechanic the players must work with, and the objective of the game is for both players to work together and advance through the levels. In terms of

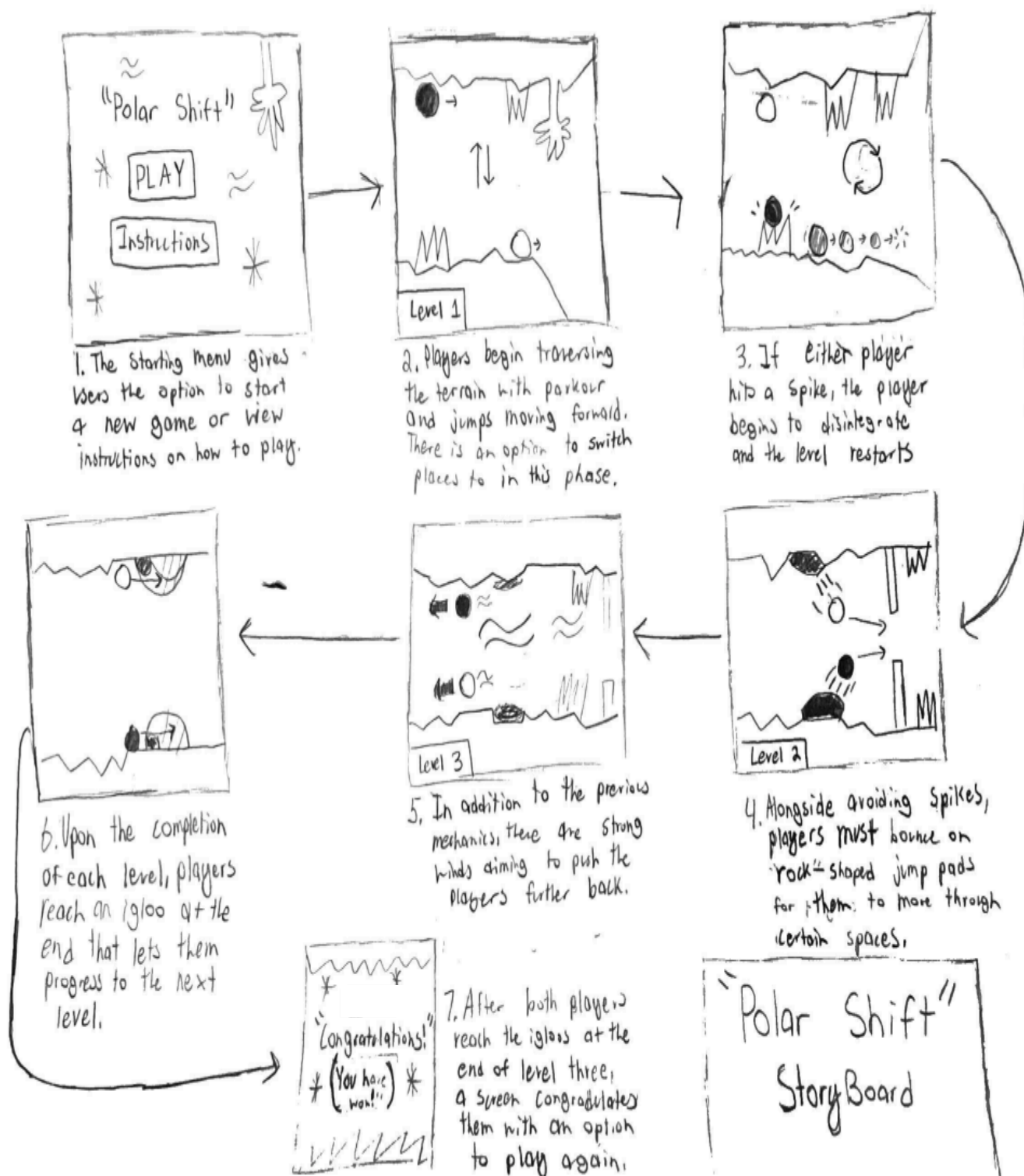
the controls, the game features the usage of 7 keys, all of the arrow keys besides the down key for one player, and the W, A, and D keys for the other player. The spacebar is the final key and central to the teamwork aspect of the game as it is the button that allows players to swap places in the game. As for the arrow keys, the right arrow makes the player move forward, the left arrow makes them move backward, and the up arrow makes the player jump. Being a two-player game, the W, A, and D keys perform the same functions, W corresponds to the up arrow, A to the left arrow, and D to the right arrow.

Alongside the general, parkour-style terrain, the first level of the game features a course with spikes that players must avoid to reach the igloo as the final destination as they traverse the rugged terrain. As the game progresses, the items from the previous level remain and each level features a new mechanic that aims to differentiate the users' experience. While still avoiding the spikes present that, if hit, make the user restart the level, the second level features multiple jumping pads that players must utilize to get through smaller openings between columns in order to reach the igloo. Ultimately, a culmination of the game's key aspects, the remaining stretch to completing the game involves the final, third level that features spikes and jumping pads but also winds that aim to push back the players in hopes of preventing them from reaching the igloos, the final destination of this wintery journey.

**Game Controls List:**

| Key   | Function                                              |
|-------|-------------------------------------------------------|
| W     | Jump                                                  |
| A     | Move left (back)                                      |
| D     | Move right (forward)                                  |
| ↑     | Jump                                                  |
| →     | Move right (forward)                                  |
| ←     | Move left (back)                                      |
| SPACE | Characters swap places on opposite ends of the course |

# Storyboard:



## FORMS APPENDIX

STUDENT COPYRIGHT CHECKLIST *(for students to complete and advisors to verify)*

STUDENT: Answer question 1 below.

- 1) Does your solution to the competitive event integrate any type of music and/or sound?
- ☒
- YES
- ☐
- NO

If NO, go to question 2.

If YES, is the music and/or sound copyrighted? ☐ YES ☒ NO

If YES, move to question 1A. If NO, move to question 1B.

- 1A) Have you asked for author permission to use the music and/or sound in your solution and included that permission (letter/form) in your documentation? If YES, move to question 2. If NO, ask for permission and if permission is granted, include the permission in your documentation.

- 1B) Is the music/sound royalty free, or did you create the music/sound yourself? If YES, cite the royalty free music/sound OR your original music/sound properly in your documentation.

CHAPTER ADVISOR: Sign below regarding your student's answer(s) to the use of music/sound in his/her competitive event solution. Even if your student answers "NO" to question 1, please sign below noting that you have evaluated the competitive event solution and the student answered the question(s) accurately.

I, JBoss (chapter advisor), have checked my student's solution and confirm that any use of music/sound is done so with proper permission and is cited correctly in the student's documentation and/or the solution has been found to have no music/sound included.

STUDENT: Answer question 2 below.

- 2) Does your solution to the competitive event integrate any graphics/videos?
- ☐
- YES
- ☒
- NO

If NO, go to question 3.

If YES, is(are) the graphics/videos copyrighted, registered and/or trademarked? ☐ YES ☐ NO

If YES, move to question 2A. If NO, move to question 2B.

- 2A) Have you asked for author permission to use the graphics and/or videos in your solution and included a permission (letter/form) in your documentation for graphic/video used? If YES, move to question 3. If NO, ask for permission and if permission is granted, include the permission in your documentation.

- 2B) Is(are) the graphics/videos royalty free, or did you create your own graphic? If YES, cite the royalty free graphics/videos OR your own original graphics/videos properly in your documentation.

CHAPTER ADVISOR: Sign below regarding your student's answer(s) to the use of graphics/videos in his/her competitive event solution. Even if your student answers "NO" to question 2, please sign below noting that you have evaluated the competitive event solution and the student answered the question(s) accurately.

I, JBoss (chapter advisor), have checked my student's solution and confirm that the use of graphics/videos with proper permission and is cited correctly in the student's documentation and/or the solution has been found to have no graphics/videos included.

STUDENT: Answer question 3 below.

- 3) Does your solution to the competitive event use another's thoughts or research?
- ☐
- YES
- ☒
- NO

If NO, this is the end of the checklist.

If YES, have you properly cited other's thoughts or research in your documentation? ☐ YES ☐ NO

CHAPTER ADVISOR: Sign below regarding your student's answer(s) to having integrated any thoughts/research of others in his/her competitive event solution. Even if your student answers "NO" to question 3, please sign below noting that you have evaluated the competitive event solution and the student answered the question(s) accurately.

I, JBoss (chapter advisor), have checked my student's solution and confirm that the use of the thoughts/research of others is done so with proper permission and is cited correctly in the student's documentation and/or the solution has been found to have all original thought with no use of other's thoughts/research.Student Initials: AS, PL, AK, TWChapter Advisor Signature: JBoss

# Plan of Work Log

| TECHNOLOGY STUDENT ASSOCIATION WORK LOG |                                  |               |                                            |                                                                                          |
|-----------------------------------------|----------------------------------|---------------|--------------------------------------------|------------------------------------------------------------------------------------------|
| Date                                    | Task                             | Time Involved | Team member responsible (student initials) | Comments                                                                                 |
| 12/5/2024                               | Brainstorm                       | 2 Hours       | AS, PC, NP                                 | Discussed challenge and potential ideas                                                  |
| 12/7/2024                               | Brainstorm                       | 2 Hours       | MW, PC, JC, AS, AK                         | Further discussed ideas and narrowed down potential game ideas                           |
| 12/15/2024                              | Brainstorm and Idea Finalization | 1 Hour        | PC, MW, AS, AK, NP, JC                     | Finalized idea to center the game around                                                 |
| 12/17/2024                              | Coding/Programming               | 2 Hours       | AS                                         | Explored different languages and possibilities to code the game on                       |
| 12/17/2024                              | Documentation Portfolio          | 1 hour        | AK, PC                                     | Began the documentation portfolio, completing background information and general outline |
| 12/24/2024                              | Coding/Programming               | 5 hours       | AS                                         | Determined coding language to utilize and began testing different commands               |
| 12/25/2024                              | Documentation Portfolio          | 2 hours       | PC, AK                                     | Began writing and completed game purpose and description portion                         |
| 12/28/2024                              | Coding/Programming               | 3 hours       | AS                                         | Created background design and graphics as well as player appearance                      |
| 12/31/2024                              | Documentation Portfolio          | 1 hour        | AK                                         | Determined and described target audience portion of portfolio                            |
| 1/7/2025                                | Coding/Programming               | 2 hours       | AS                                         | Programming for development of video game and completion of first draft                  |

|           |                             |            |                |                                                                                                                           |
|-----------|-----------------------------|------------|----------------|---------------------------------------------------------------------------------------------------------------------------|
| 1/10/2025 | Testing                     | 1 hour     | PC, MW, NP     | Testing the first draft of the video game and discussed potential areas of weakness and necessities for improvement       |
| 1/13/2025 | Coding/Programming          | 3 hours    | AS             | Programming for the development of video game.                                                                            |
| 1/15/2025 | Testing                     | 30 minutes | PC, MK, AK, AS | Tested the latest version of the video game and suggested potential improvements                                          |
| 1/20/2025 | Documentation Portfolio     | 2 hours    | PC, JC         | Reflection and creation of hand-drawn storyboards.                                                                        |
| 1/31/2025 | Coding/Programming          | 3 hours    | AS             | Accepted changes and completely finished game development                                                                 |
| 2/7/2025  | Finished Game and Portfolio | 7 Hours    | AS, AK, PC     | Tested the final product to write a section explaining how to play the game and game controls. Made final touches/ edits. |
| 4/27/2025 | Fixed Bugs                  | 2 Hours    | AS             | Fixed respawn bug and made some level changes                                                                             |