- **Design Question(s) - description, justification**

Our team was interested in understanding how novice players interacted with the various aspects of the game as well as their overall experience with player movement, player customization, and the mini-games. We conducted usability testing to understand how users interact with our system. We wanted to see if there was a gap in the understanding of the game and overall experience between us, the developers, and the users. Since our team created each mini-game, we had a good understanding of the rules and controls for the game. However, we wanted to evaluate whether a new user who has no outside aid would be able to enjoy and successfully play our game. We wanted to make sure that our game was internally complete. We did this by recruiting 10 users and conducting a one-on-one evaluation, which would bring attention to any bugs or unhandled cases that we overlooked. We were also interested in evaluating how enjoyable the experience was for the user. Since enjoyment is a very important aspect of whether people would actually play our game, we decided to evaluate how much the users enjoyed the game. The data that we collected from 10 different users allowed us to gain insight on the overall experience users would have to play the game. Usability testing also gave us a direction on how to make the game more enjoyable and how to provide a better overall user experience.

- **Approach to testing design question(s) and Playtest methods**

For testing our design questions, we wanted to make sure that the player was able to get a clear overview of not only the minigame aspects of the game, but how they fit into the other aspects of our game mechanics such as movement/control, interaction with the NPCs in our game, and overall player experience. Therefore, for testing purposes, we allowed players to have the full experience, starting from customizing their character and then interacting with NPCs, then running through the minigames one at a time. To make it more streamlined for testing, after the player creates their character, they are placed directly in front of an npc. For testing purposes, this made it clear for the player who they should talk to, and made it quicker to test the minigame mechanics while still being able to interact with all of the mechanics implemented into our game.

From a playtest script perspective, since our story/progression is not fully fleshed out yet, it made sense to give background to the player before they start to give motivation behind why the minigames exist and why our game involves dialogue with the npcs in this manner. After giving this introduction, we thought it would be helpful having the player run through the character creation for usability testing and feedback on whether it fit in with the game or if it

contributed to the player's enjoyment of the game. After this, placing the player in our hub scene in front of an npc allowed a quick way to access minigames, and since the game currently does not have a movement tutorial or informational screen, we decided that this would be the best time to explain general movement and interaction controls. We thought this would be beneficial instead of having the player try to figure it out, because even if we explained the controls, the player's ability to interface with the controls set forth is still an important aspect to consider. After allowing the player to play around with the controls, we decided it would be best to gear them towards testing the minigames, since these are the most mechanically heavy aspects of our game. Since we put the player in the main world, it made it easier to get feedback on the interaction mechanics with our NPCs, such as the dialogue, and using this as an outlet to get into the minigame challenges. In addition, since each minigame puts the player back in the hub when they exit, it gives multiple opportunities to see the player interact with the dialogue mechanics of our game as well.

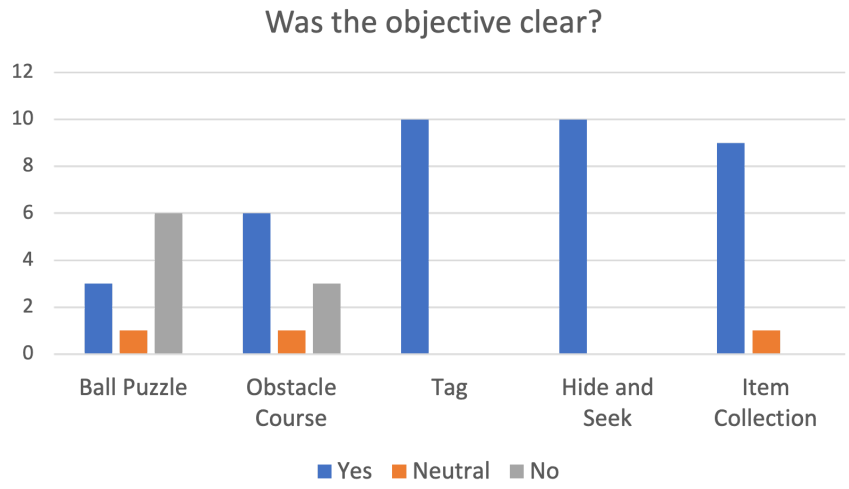
For deciding metrics to measure during minigame testing, our main focus was on game difficulty, which we measured by the number of tries it took to complete a certain game or how long the player took to complete particular games in the case of our ball pushing puzzle. These metrics are pretty clear, as they can quickly show if a game is too difficult or too easy, as well as seeing how different testers, who might have different levels of experience relating to games, interacted with the game and how quickly they were able to pick up on mechanics. By using these metrics, it makes it clear whether an aspect of our game is too difficult or too easy.

After the player completes all the minigames, we thought that a post game questionnaire would best suit our needs for gathering feedback, as many of the aspects we were focusing on in our testing relate to how fun aspects of our game are, as well as how the player feels about gameplay mechanics and the overall usability. Therefore, most of our questions focused on how intuitive our game mechanics were for the player, and how fun they thought each of the minigames were, as well as leaving a question for general feedback to entice the player to giving feedback on aspects we may not have considered due to our familiarity with the game mechanics. Since each game posed different technical information for the player to learn, we decided to have a predetermined set of questions to ask for each minigame to gauge whether it was intuitive, fun, and clear, thereby giving us a better idea as to how it fits into the overall game. Along with this, asking about the interface makes sure that the way the player interacts with our game is straightforward and improves the overall player experience. Asking this kind of question also gives an outside perspective on controls that may seem apparent to us as designers, but not so much for the average user.

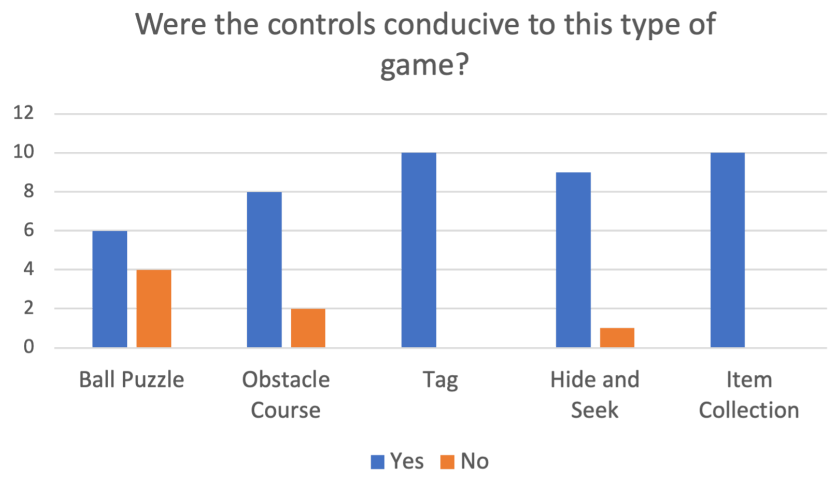
- **Results summary/Analysis**

First of all, all participants said that the movement of our game character was intuitive, and all participants were also positive about our character customization. They especially liked being able to create their own characters through customization, but some added that they wish there were more options (e.g., more hair types).

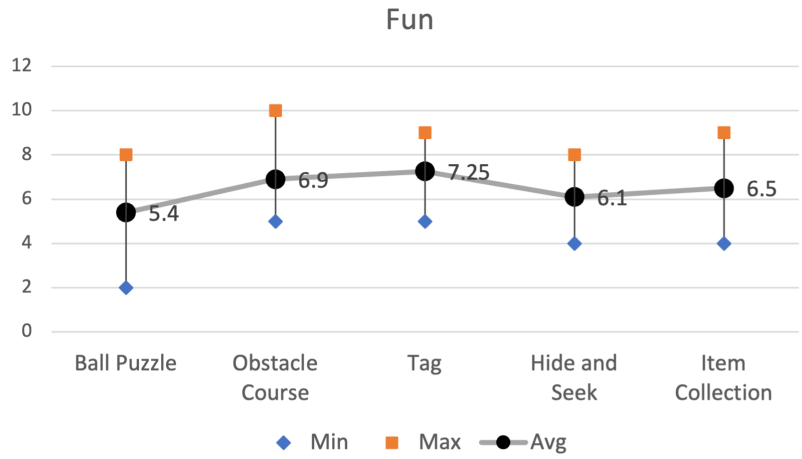
As for whether the objective of each game was clear, Tag, Hide and seek, and Item collection had a clear objective, the Obstacle course needed some improvements, and the ball puzzle had more negative opinions (see the figure below). For example, in the case of the Obstacle course, since five participants did not know how many points they needed to win the game, this part should be improved. Regarding Ball Puzzle, about half of the participants were confused about what and how to play the game from the beginning.



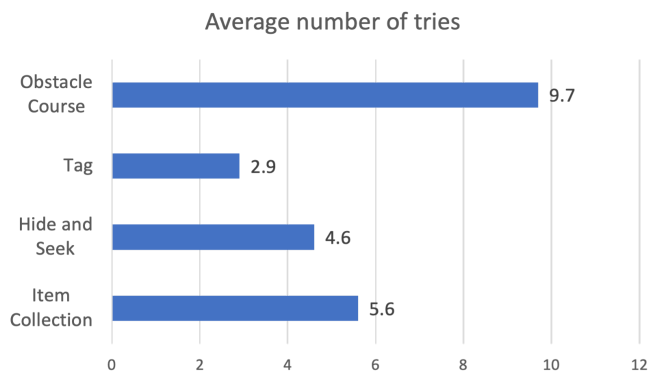
When asked about the control of each game, it showed a similar tendency to the objective clarity (see the figure below). There was little difficulty in controlling Tag, Item collection, and Hide and seek, but in the case of the Obstacle course, participants said that the player movement was too slidey to stay on and fell off the route easily. In the case of the Ball Puzzle, more than half of the participants said they had difficulty moving and manipulating the ball itself.



We asked participants to rate the fun of each game on a scale of 1 to 10. The graph below shows the minimum, average, and maximum fun rates for each game. Regarding the average fun rate, Tag received the highest score (7.25), followed by the Obstacle course (6.9). Next, Item Collection scored 6.5 points, and Hide and Seek scored 6.1 points. Ball Puzzle had the lowest score of 5.4.



Furthermore, our team members recorded the amount of time remaining after completing the Ball Puzzle and how many times the user tried playing the Obstacle course, Tag, Hide and Seek, and Item Collection Game. First, in the case of the Ball Puzzle, two participants succeeded with 54 seconds and 66 seconds left, but all other participants did not succeed. As for the average number of tries of other games, the Obstacle course had the highest attempts with 9.7 times, followed by the Item Collection with 5.6 attempts to win (see the figure below). Hide and Seek took 4.6 attempts, and finally, the Tag game was relatively easy to win with 2.9 attempts.



For overall feedback, many participants mentioned the need for clear instructions before each game and general menus. They said it would be nice to have a menu option for game settings or pausing the game. Finally, some participants commented that some games were more difficult than others, but most participants gave feedback that each game was fun to play.

- **Action Items/Future Work**
    - Action items:
        - Add world building assets
        - Add storyline, dialogue management
        - Connect with relationship system
        - Procedural generation for the tile pattern in Roly Poly
    - Fix known bugs:
        - After a minigame resets and starts, the player is in running animation then goes back to idle
        - Jumping does not work properly (except in Obstacle Course)
        - Harsh shadows
        - Obstacle Course uses raw horizontal input (not clamped)
        - Jumping in Obstacle Course sometimes launches the player very far
        - Obstacle Course sometimes get stuck on Lose screen
    - Add quality of life improvements:
        - How to Play (instructions) opening automatically the first time you play a minigame
        - Make the help and pause buttons more clear
        - Add cues for dialogue (prompt scrolling and pressing click/enter)
        - Press escape as another option to pause
        - Add main game menu with controls information
        - Add more audio