



Game Design Document

Humansoft - Coin Craze Match-3

Date	Author	Change Log
2/11/2019	Brian Mahoney	First draft
2/14/2019	Brian Mahoney	Updated mechanics, added UI and Blast Wave mocks

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Objective

The purpose of this document is to summarize the design of Coin Craze (working title), a new match-three game that will be built by Humansoft. This game has been designed from the ground up for cash competition on the Skillz mobile eSports platform. Although Skillz is providing design guidance up front, the final implementation and execution of the game will be handled by Humansoft, and the development plan will be created as a joint consensus between the two teams. This document will be updated as needed if any changes are made to the plan.

Where appropriate, additional information will be provided to guide the implementation of the game based on the agreed-upon plan. This guidance is based on design expertise that we have observed working successfully on previous games, and it is meant to provide insight into key issues rather than a formal prescription.

This document will focus primarily on design elements that are specific to this game. Further direction regarding Skillz integration can be found in our [developer portal documentation](#).

Design Overview

Core Gameplay

Coin Craze is a timed match-three game in which the player swaps adjacent colored vials to form matching lines of three or more, which causes the vials to disappear from the grid. When this happens, the game objects fall downward to fill in any gaps, and new vials come in from the top of the screen. As matches are made, each vial that is removed fills in a meter on the left side of the screen. Each time the meter fills, a coin flies off the top of the meter and drops into the column which was vacated by the vials.

The coins are worth far more points than vials, but in order to score them they must be maneuvered to the bottom of the game board where they drop out and score points. Coins can also be matched together to increase the value of all future coins. The basic strategy of the game is to create as many coins as possible, match about half of them, and then try to maneuver the rest to the bottom of the game board.

Players can pursue advanced strategies by matching four or more objects in a line. Matching four vials in a row will create a blast wave that destroys all the vials (not coins) in the entire row or column in the direction of the match. Matching five vials creates a 5x5 explosion. Matching more than three coins in a row increases the score value of coins for the rest of the game.

The game ends when the timer runs out. Any coins remaining on the board are left unscored.

Game Board Setup

Coin Craze takes place on a tall 8x12 grid with a vertical progress meter along the left side. At the beginning of the game, the grid will be populated with six colors of vials (little glass bottles with brightly colored liquid inside -- they might be potions or alchemy ingredients, for example).

Each type of vial should have a clear dominant color (other colors are fine for details) and a unique silhouette so that the player can distinguish the different items at a glance. When vials are destroyed, they should have a bit of a magical quality, like a puff of smoke, light, or glitter.

Coins should be SILVER and somewhat shiny so that they really stand out brightly on the game board.

The initial game board setup will need to be run through an algorithm to ensure that no matches exist at the beginning of the game.

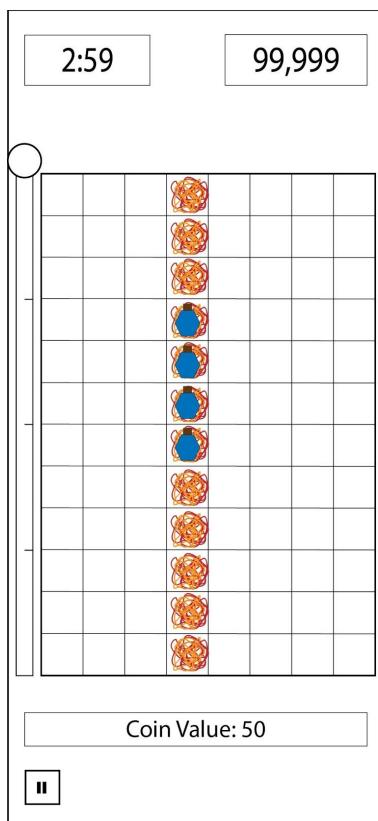
Evaluating Matched Game Objects

There are several different types of matches that players can create by swapping items around. All matches must be in a line. (If the player creates a T or L shape, it would be evaluated as two intersecting lines.) Here is how each such match should be handled:

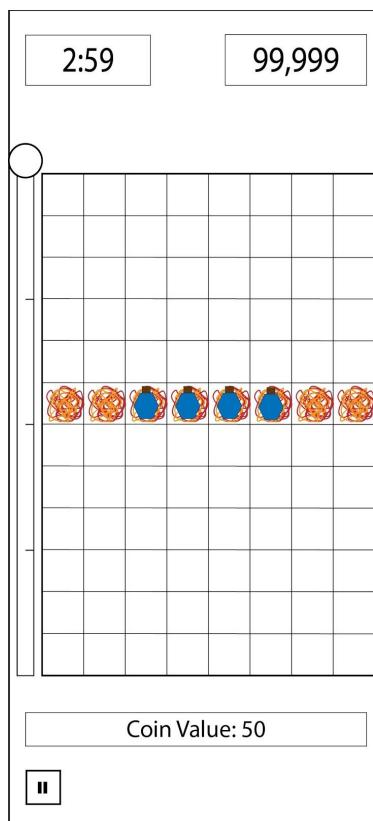
- **Lining up three matching vials** -- The vials vanish in a puff of smoke. The meter fills by three. Game objects fall down from above to fill the void, and new game objects fall in through the top of the board.
- **Lining up four matching vials** -- A “blast wave” explodes out from both ends of the line, causing all vials in the row or column (depending on which way the vials were lined up) to vanish in a puff of smoke. The meter fills based on the number of vials destroyed. Coins are NOT destroyed by the blast wave.
- **Lining up five matching vials** -- A 5x5 vast wave explodes out from the line causing all affected vials to be destroyed. The meter fills based on the number of vials destroyed. Coins are NOT destroyed by the blast wave.
- **Lining up coins** -- The coins vanish from the board without being matched and are “invested” to increase the value of all future coins that are dropped out of the board:
 - 3-coin match -- Increases coin value by one unit (based on the “score_coin_increase” game parameter)
 - 4-coin match -- Increases coin value by two units
 - 5-coin match -- Increases coin value by three units
- **Filling the Coin Meter** -- The coin meter requires a certain number of vials to fill. It goes up by one unit for each vial that is destroyed (either by matching or by a blast wave). Each time the meter fills to the top, a coin flies out and goes into the column where the

player ENDED his or her swap gesture. (There will always be an opening in that column due to the match that was just made.)

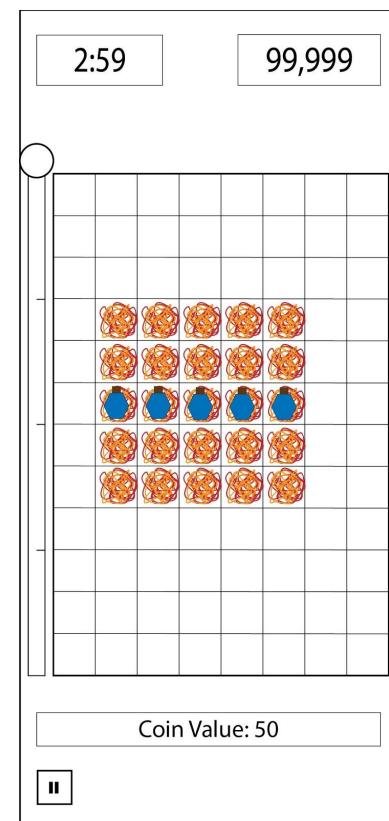
- **Cascades** -- A cascade occurs when one explosion causes another subsequent explosion. In Coin Frenzy, there is no score bonus for cascades, but they do increase the coin meter more quickly. For example, if a play matches three vials and it causes two cascades of three vials each, the meter would increase by three for the first match, four for the first cascade, and five for the second cascade. Each additional cascade adds an additional bonus of 1 to the meter fill amount.
- **No More Moves** -- After each move resolves, the game needs to check the gameboard to ensure that there is at least one move to be made. If not, then the following process will occur:
 - The timer is paused
 - The player is notified with flying text over the game board (No Moves Left!)
 - All the vials are re-arranged randomly (coins stay right where they are) until there is at least one valid move (or a cascade occurs leading to a move)
 - The timer resumes and gameplay continues



Vertical Blast Wave



Horizontal Blast Wave



5x5 Blast Wave

Competitive Format

Matches will take place in an asynchronous tournament format in which each player plays individually to receive a score. Once all players in a match have completed their games (which need not take place at the same time) the match will resolve with the highest scoring player declared as the winner.

Each match will consist of a single continuous game limited by a game timer. The game ends when the timer runs out or the player quits the game from the pause menu.

Scoring

Each match will be won by the player who earns the most points. Below is a list of all the game actions that award points. The actual point values should be parameterized. (Refer to the “Game Parameters” section for further details.) The score values below are just examples.

- **Matching vials** -- 10 points per vial
- **Destroying vials with blast waves** -- 10 points per vial
- **Matching coins** -- No score value, but the value of all future coins is increased
- **Dropping coins out of the bottom of the game board** -- 100 points per coin (base value -- this goes up as coins are matched)

Tutorial / First Time User Experience

When a user plays Coin Craze for the first time, a brief tutorial will be presented that covers the most important elements of the game:

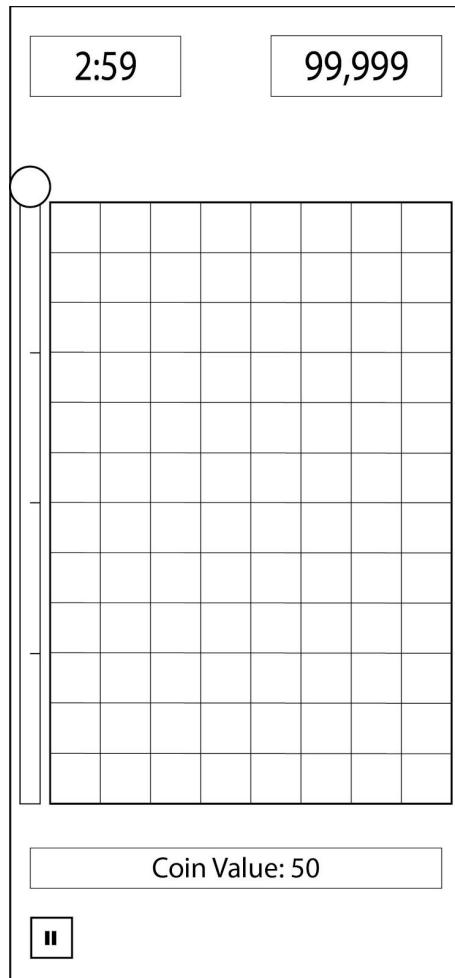
- Swap items to create lines of three or more matching vials
 - Tap and drag to swap
 - Only moves that make a valid match are allowed
- Match more than three items to activate an explosive effect
 - Matching four in a row creates an explosion that removes the entire row or column
 - Matching five in a row creates a 5x5 explosion centered on the line
 - Explosions do not destroy coins
- Earn coins by destroying vials to fill up the meter
 - Earn big points for coins by dropping them out the bottom of the game board
 - Match coins together to increase the value of all future coins dropped
 - Don’t match too many coins; save some for earning points
- The game ends when the timer is up

Fairness Considerations

In order to ensure that players are competing on a level playing field, each player in a match will receive the exact same starting board configuration. Additionally, each column will be generated by a seeded RNG (all seeded using Skillz Random) so that the same sequence of game pieces will fall into each column as it is cleared. (Exception: When a coin is generated, it gets inserted into the column where the player ended his or her swap, delaying the vial that would have fallen there.)

User Interface

Main Game UI



The game should be locked in “portrait” orientation. The user interface during gameplay will contain the following elements:

- **Score (Top Right)** - The player’s current score, with commas for values over 999.
- **Time Remaining (Top Left)** - The time remaining in the match in M:SS format.
 - The timer counts downward to zero. When it reaches 15 seconds, it should turn red and pulse once per second.
- **Game Board (Center Right)** - The 8x12 grid filled with vials. The background of the game board should have a low-contrast checkerboard pattern to subtly show where the squares are.
- **Coin Meter (Left Side of Game Board)** - This is a vertical meter that fills in from the bottom as vials are removed. The amount of vials required to fill the meter will be configurable as a game parameter.
- **Coin On Deck (Top of the Meter)** - A coin will sit atop the Coin Meter. Each time the meter fills, this coin will be flung off of the top of the meter and into the column which spawned the coin. A new coin will immediately appear to take its place.
- **Coin Value Tracker (Below Game Board)** - This tracks the current value of each coin that is dropped. It goes up every time the player matches coins on the board.
- **Pause Button (Bottom Left)** - This button should have a pause symbol on it (two horizontal lines). Tapping it should do the following:
 - Hide the gameboard
 - Provide a very brief overview of how to play
 - Offer a menu of these options:
 - Resume Game
 - Sound Effects On/Off
 - Music On/Off (if any)
 - Quit Match - This should submit the player’s current score.
 - Players should be limited to a few pauses per game (configurable as a game parameter) to prevent players from exploiting the feature.

Game Controls

The controls for this game are very simple. The player touches and drags a piece to swap it with an adjacent piece. Here are some additional details of how the animations will work:

- Once the player has dragged a piece a few pixels toward another piece, the game pieces will immediately swap.
- If the swap did not result in a match being made, the game pieces will immediately swap back to where they began.
- If a player keeps his/her finger on the screen after a swap, the touch will be ignored until the player lifts the finger and begins a new move.

- Dragging a game piece toward the edge of the board has no effect.
- After a move is made, the game model should update (behind the scenes) even if animations are still on-screen. Additional moves can be made based on the new positions of game pieces, although the new moves might not animate until the previous animations complete.
- Multi-touch is not supported on the game board. Touching the screen in multiple places at once within the grid will interfere with the ability to make swapping gestures.

Scoring Summary Screen

At the end of the game, the player will be presented with a scoring summary screen that displays how the final score was calculated:

Vials Destroyed: [Vials Destroyed]	[Points Earned]
Coins Dropped: [Coins Dropped]	[Points Earned]
Final Coin Value: [Final Coin Value]	
Final Score:	[Total Points Earned]

Submit Score

The **Final Score** row will appear in a larger font and be the primary focus of the Scoring Summary Screen.

Each row of the scoring summary screen will fill in an animated way, with the “Points Earned” counting up in tandem with the source of the points. Tapping the screen during the animated roll-up will skip the animation and immediately jump to the display of the final totals.

The **Submit Score** button will be on a 15 second timer (displayed as a timer bar beneath the button) after which the score is submitted automatically if the player doesn’t tap it before then. The timer will begin when the animated roll-up ends. When the score is submitted, the game will transition to the tournament leaderboard provided by the Skillz SDK.

SFX and Music

Sound effects will be present for the following game actions:

- Game start countdown

- Matching three vials (vials disappear in a puff)
- Matching four vials (the entire row/column explodes)
- Matching five vials (a blast wave destroys a 5x5 area)
- A coin flings into the game board
- A coin drops out of the game board and is scored
- Matching three coins
- Matching four coins (double coin bonus)
- Matching five coins (triple coin bonus)
- Attempting an invalid move (pieces swap back to their original position)
- Timer running out (15 seconds left warning)
- Out of time
- Game end fanfare
- Scoring roll-up
- UI button taps

Music may also be included for the game start screen and/or during gameplay (TBD).

Game Parameters

A comprehensive lists of parameters we recommend adding to configure match rules and award points for scoring are as follows.

Format Rules

<u>Parameter</u>	<u>Values</u>	<u>Notes</u>
match_timer	180	Match time limit in seconds
vials_meter_fill	15	The number of vials that must be destroyed to fill the meter
vials_colors	6	The number of colors of vials (4 - 7).

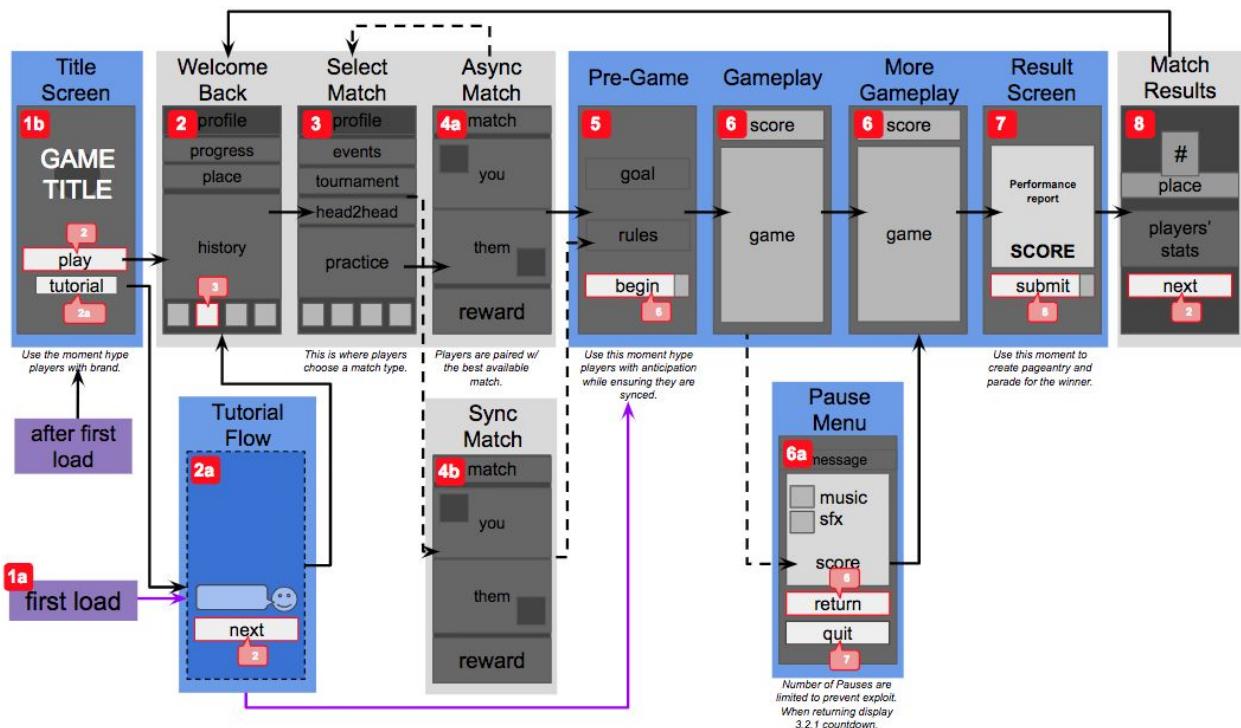
Scoring

<u>Parameter</u>	<u>Suggested Values</u>	<u>Notes</u>
score_vials	10	The score value for each vial removed
score_coin_drop	100	The starting score value for each coin collected
score_coin_increase	50	The amount by which the coin score value increases for each coin bonus earned

APPENDIX

Screenflow Summary

<u>Load App</u>	<u>Skillz SDK</u>	<u>Gameplay</u>	<u>Skillz SDK</u>
1b Login & Tutorial 1a Title Screen & Main Menu	2 Welcome Back 2a Tutorial 3 Selecting Tournament 4a Async Match-making 4b Sync Match-making	5 Pre-game Choreography/Goals 6 Play Match 6a Pause Screen 7 Results Screen	8 Match Results 9 Video Replay

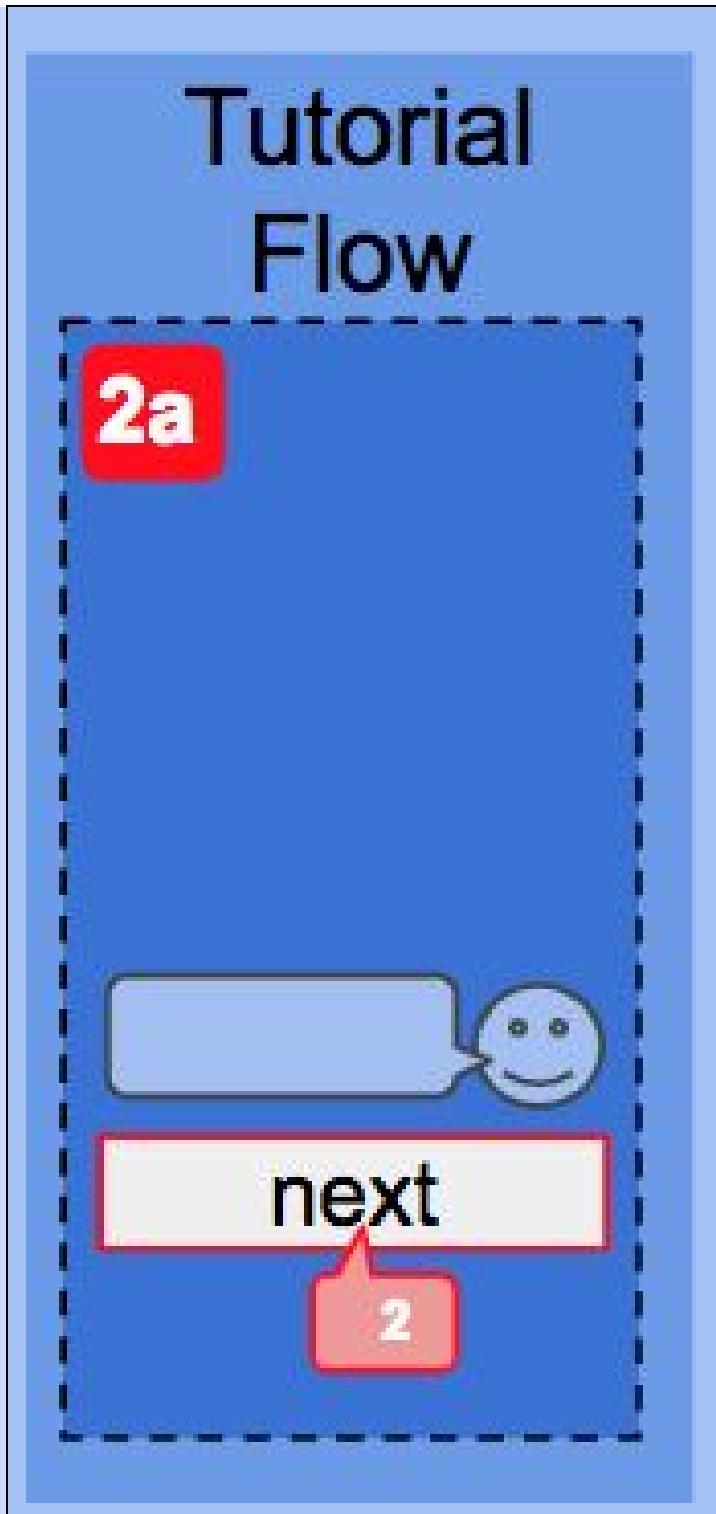


Screens & High-Level Instruction

Example Mocks

1a On First App Open the game funnels players through a Tutorial experience getting them to gameplay immediately.

- A. This will circumvent the Main Menu and SDK tournament user flow steps **1b - 4** so that the player can learn to play through the tutorial.
 - a. When exiting this first attempt, the player will be returned back to the main screen **1b**
- B. We suggest accelerating the base games current tutorial and including information on additional scoring mechanisms.
- C. On subsequent loads, the player should start at **1b**



2a Tutorial

- A. This flow behaves differently on the first load
 - a. On first load exiting the tutorial should circumvent the Main Menu and SDK tournament user flow steps **1b - 4** so that the player can learn to play through tutorial.
 - b. When exiting this the tutorial on later attempts, the player will be returned back to the Welcome Back screen **2**
 - c. Rarely a request will be made to insert the Tutorial as a Pause Menu option.

1b After FTUE, Player Loads the App to the Start Screen and proceeds to a Main Menu.

- A. These are client screens controlled by the game
- B. The Title Screen is the landing page for the game and should include branding and a play button
 - a. We have found that creating stronger focus on the Play button over other screen elements improves Install to 1z and D1 metrics and suggest making the callout extremely obvious.
- C. This is also where you will want to put alternative features. The (?) and (gear) buttons are placeholder and should be replaced with an appropriate icon if needed.
 - a. (?) = Tutorial
 - i. We suggest using as much of the base games tutorial for this as possible.
 - b. (gear) = Settings
 - i. This is a place to include sound controls
 - 1. Music
 - 2. SFX
- D. Tapping Play button proceeds to screen **2**.



(Mock of title screen)

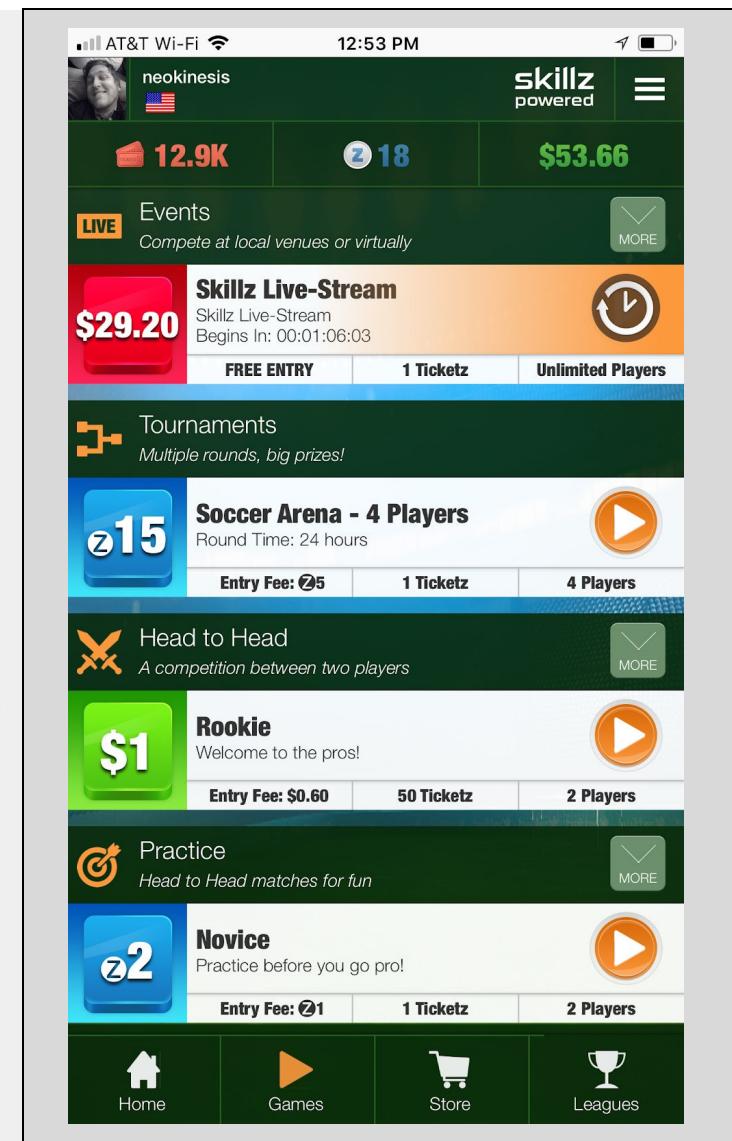
2 Game loads to Skillz SDK, player is shown the “Welcome Back” screen

- A. Shows results of completed games, rankings in tournaments, pending games, etc.
- B. New players are placed into an account creation and Skillz Onboarding Tutorial
- C. Tapping the GAMES tab button moves to screen **3**



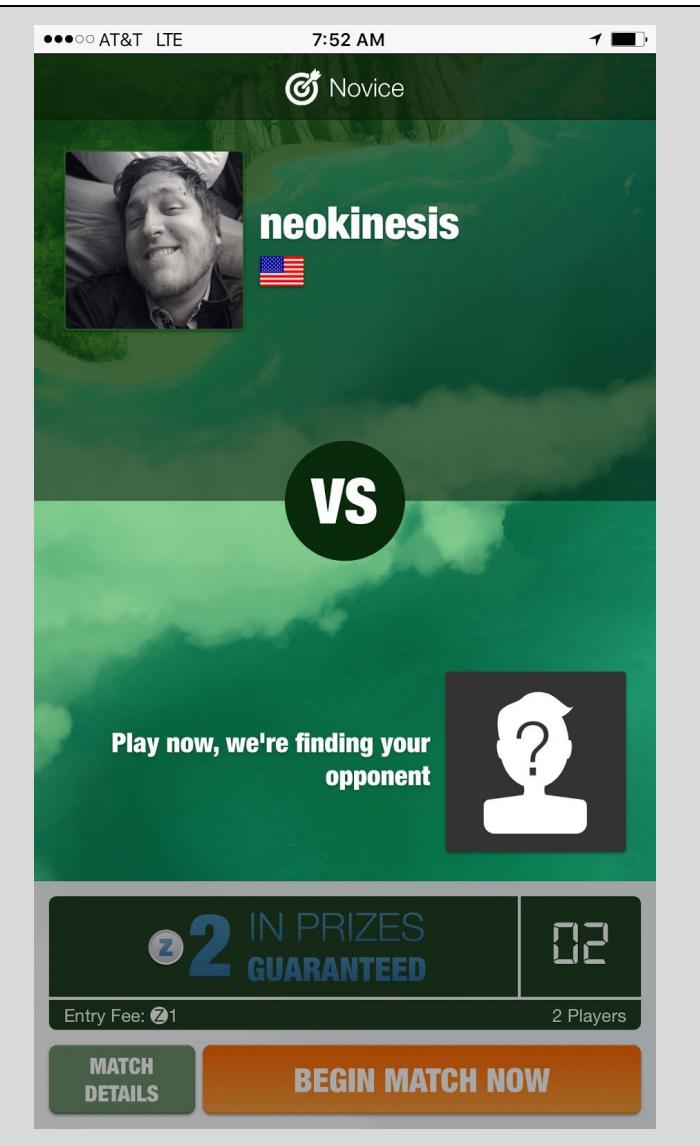
3 The Games list displays different tournament types, with varied stakes

- A. This includes: virtual currency ("z") matches
- B. Cash async matches
- C. Live events
- D. Bracket or other style multiplayer tournaments
- E. Each tournament has a name, an entry fee and potential rules or tuning changes.
 - a. Tournaments can be tuned individually using parameters.
- F. Skillz recommends a specific ruleset for all asynchronous tournaments.
- G. This design does not include Synchronous tournaments which can be addressed separately at a later time.
- H. Tapping a tournament button proceeds to matching screen **4**.



4 Player chooses a tournament and is matched with another player

- A. Skillz provides an ELO-based “skillz difficulty” rating to determine difficulty. Skillz suggests assigning these difficulty levels appropriate names to create a sense of progression and to support the expectation of increasing difficulty as a player ascends. The use of “Novice” is an example and should be replaced by the best NeoBlox equivalent.
- B. Skillz Random will be used to define the seed that both the player and their matched opponent will play on, ensuring players get the same experience.
 - a. Rules for the tournament will be defined using parameters.
- C. This screen will conclude after a few seconds automatically or can be manually skipped by tapping the Begin Match Now button. Both will proceed to screen **5**.



5 SDK passes the player back to client gameplay, beginning with Pre-Game choreography to ensure players are ready when tournament begins.

- A. Pre-game choreography should display the game's logo and transition game elements onto the screen.
- B. For games with tunable or selectable characters, we recommend using this opportunity to allow players to configure the game for the match and ready up.
- C. We recommend displaying a countdown to punctuate when the match begins for the player.

Examples:

- i. Ready, Set, GO!
- ii. 3, 2, 1, GO!

The image shows a mockup of a mobile application interface for a pre-game screen. The title 'Pre-Game' is at the top in a large, bold, black font. Below it is a dark grey rectangular area containing several elements: a red rounded square in the top-left corner with the number '5' in white; a large white rectangular box with the word 'goal' in black; a smaller white rectangular box below it with the word 'rules'; and a large white rectangular button in the bottom-right corner with the word 'begin' in black. A small red rounded square with the number '6' is positioned at the bottom center of the screen. The entire interface is set against a light blue background. At the bottom right, there is a white box containing the text: *'Use this moment to hype players with anticipation while ensuring they are synced.'*. Below this text is the caption '(Mock of pre-game screen)'.

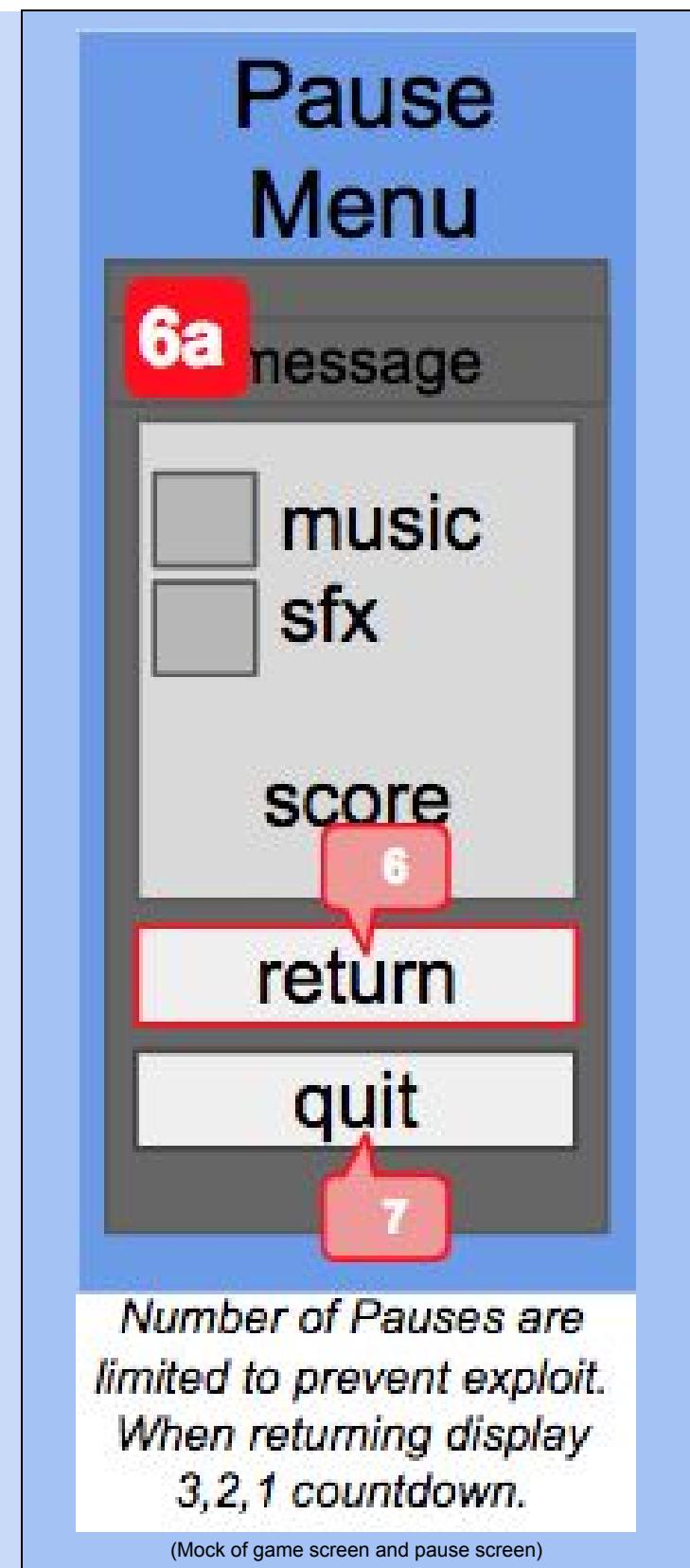
6 Match begins; Players participate, earning score

- A. The UI should include a **timer**, **pause** button, **score** label, **game board/area**.
 - a. There is a timer which displays prominently.
 - i. Match time should be configurable as a game parameter so Skillz can help experiment with different game lengths.
 - b. We suggest creating a parameter which limits the number of times a player may pause the game to prevent possible exploits.
- B. Score is determined throughout the match. We suggest implementing scoring so that each part can be configured as a parameter for flexibility and tuning
 - a. We recommend optimizing for skill scoring caps by visualizing points and time where appropriate:
#s appear when players score connecting positive actions to point accumulation.
- C. As the matchtime is nearing the end, give the player a visual and audio cue.
 - a. We suggest flashing or pulsing the area behind the timer for a short time to draw attention to the time remaining.
 - b. We also suggest display 'X time left' below the goal line and above the active piece area to communicate to the player the action.



6a Pause Screen is accessible during gameplay.

- A. Elements which should be included on the Pause Menus Include
 - a. Music and SFX Toggle Controls.
 - b. Score, which is determined throughout the match. If at any time the player pause the match, the sum of their current points should be totaled for them to make an informed decision about whether they want to submit their score early.
 - c. Exit and Return Buttons
 - i. Exiting should display a confirm to prevent accidental, early exits.



7 Game ends with score summary

- A. The score screen displays a breakdown of performance so the player can see how the overall Score is calculated.
 - a. Score is submitted after the player presses "Submit Score" or automatically after (10) seconds.
 - i. An onscreen meter drains to indicate time remaining until auto-submit happens.
 - ii. This value should be controlled with a parameter.

B. Recommended Score breakdown:

The sum of the values displayed onscreen should equal the players total score

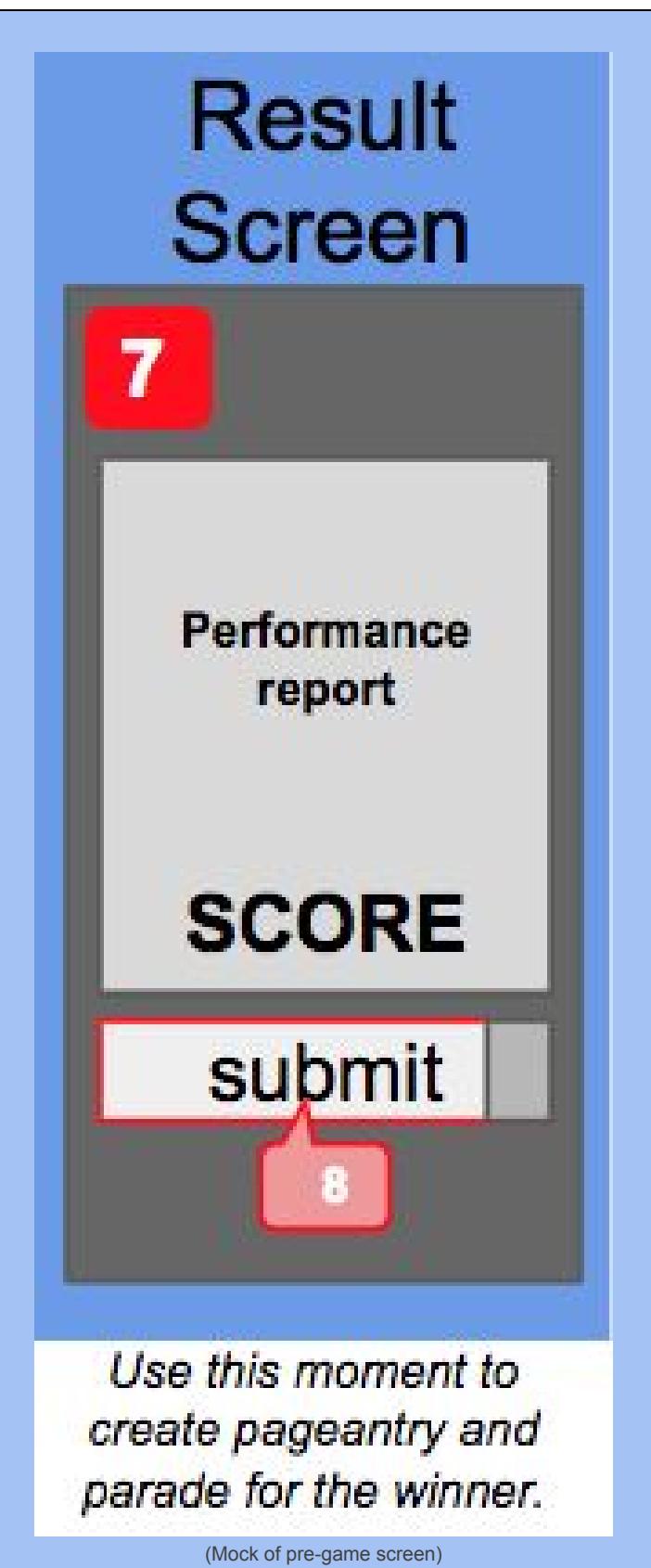
Example: line 1 + line 2 + line 3 = Total

Choreography of score should roll-up values line by line starting at the top and moving downward.

- Each line item should roll-up, one at a time.
- The motion/sound and rollup across all the line items should feel continuous.
- The speed of the roll-up should increase as the number gets larger.
- Scores should be right justified so that digits align
 - Roll-up Timing should not be linear and speed up as scores get larger.

Target velocity similar to this:

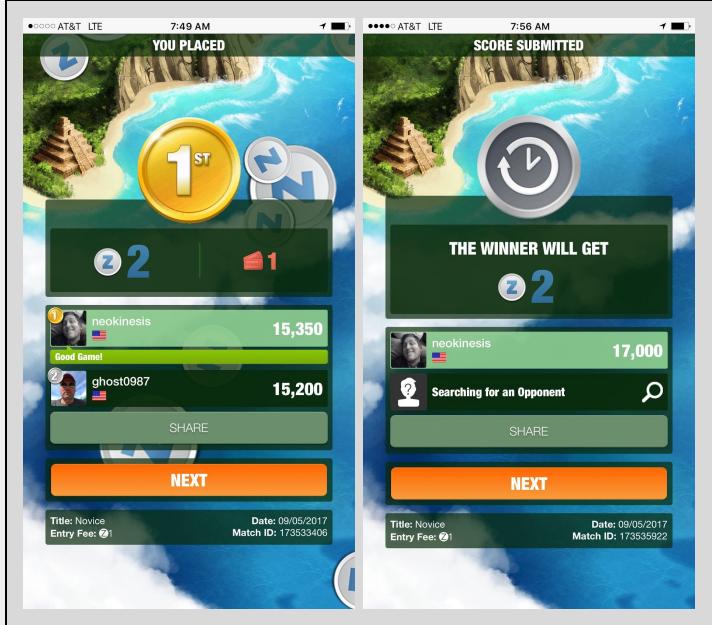
0 to 1,000	=	1k per sec
1,001 to 5,000	=	2k per sec
5,001 to 25,000	=	7k per sec
25,001 to 100,000	=	25k per sec
Over 100,000	=	100k per sec



(Mock of pre-game screen)

8 Client gameplay submits score back to skillz SDK, displaying match end screen

- A. If the opponent has not finished or been matched-up yet, there are variants of this screen.
- B. Tapping next goes back to screen 2 and displays match results.



9 Player can watch a replay (of cash games) to compare performance to the opponent.

- A. The replays can inform the player of how the opponent played and give a good sense of the meta game. Skillz will investigate starting replays at the last frame so it will be easy to get a side by side view of both players score breakdown.

