Quantitative Analysis of Game Balance in 'The Coquitlam Crunch'

Introduction:

In this project, we present a comprehensive quantitative analysis of the game "The Coquitlam Crunch," focusing on the intricate interplay between probabilities and design elements. Our objective was to explore various quantitative aspects, such as game duration, turn times, score ranges, and card distributions, to achieve a balanced gameplay experience. By assessing the impact of these metrics on the design process, we aimed to enhance the overall enjoyment for our players.

Key Metrics Analysed:

We examined the following key metrics in our analysis:

1. Average Game Duration
2. Win Rates
3. Turn Times per Player
4. Variability of Event Cards
5. Variability of Sabotage Cards
6. Average Cards Drawn
7. Total Stamina Station Cards needed to reach the finish line

Game Duration:

Using a dedicated spreadsheet, we recorded variables like game duration, turn times per player, stamina tokens needed, and card draws. Across the two playtest rotations, the average game duration was approximately 38 - 40 minutes. However, individual player experiences could cause variations in this duration. Players had the option to use all their stamina tokens at once and skip their turn for an additional advantage or utilise sabotage cards to alter the game pace.

Analysis of Win Rates:

The win rates among players were remarkably balanced. With four members on our playtesting team, the first player typically won within the first 25 minutes on average, followed by the second player after 5-7 minutes and the third player after another 2 minutes.

Evaluation of Turn Times:

The average turn time per player was 35 - 40 seconds, with a wide range spanning from 7 seconds to 1.15 minutes.

Event Card Variability:

The game comprised a total of 16 unique event cards, with the following variations:

1. 6 negative cards (40% of the deck)
2. 2 neutral cards (16.67% of the deck)
3. 7 positive cards (46.67% of the deck)

Sabotage Card Variability:

The game featured 16 unique sabotage cards, adding an engaging strategic element, as players could use them at any point during the game.

Cards Drawn on Average:

On average, each of the four players drew 15 unique sabotage cards and 15 unique event cards throughout each game.

Total Number of Stamina Tokens Needed to Reach the Finish Line:

The average number of stamina station tokens required to reach the goal was 12, and this distribution was well-balanced among players.

Recorded Changes in Game Design:

After the first playtest, we identified that the game's strategic aspect was relatively overshadowed by chance. To address this, we introduced a new rule: players could double the number on the dice by spending a stamina token at the start of their turn. This rule encouraged strategic decision-making, as players had to weigh the advantage of taking the lead versus preserving their stamina tokens for later use. The overall game experience remained fair and enjoyable throughout these modifications.