Game Design Document

Ratatouille Royale

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1 Overview

- Name: **Ratatouille Royale**

Ratatouille Ratatouille (or **Ratroyale**) is a turn-based strategy board game utilizing cards on a hexagonal grid. The game supports two gameplay modes: player versus AI or player versus player. The primary objective is to destroy all enemy Lairs. Victory is achieved when all opposing Lairs have been eliminated.

Each turn, players are allocated a resource called "crumbs." All in-game actions require crumbs to execute. Crumbs do not accumulate between turns and any unused crumbs are forfeited at the end of each round. Players are permitted to perform actions in any order, provided they possess sufficient crumbs.

2 Game Theme

Main Theme: Rat Wars

Environment Settings: The game takes place across various culinary environments, including, but not limited to:
- Kitchen
- Bakery
- Coffee shop
- Food truck
- Pantry
- Grocery store

Arsenal and Equipment: Combat is conducted using repurposed culinary implements and food items, including but not limited to:
- Utensils (forks, spoons, knives, whisks, etc.)
- Food items (baguettes, rolling pins, cheese wheels, etc.)
- Miscellaneous kitchen implements

Factions: The conflict is waged between two distinct rodent factions:
- Rats
- Mice

3 Terminology

3.1 Core Game Terms

Squeaks: The primary card type in the game. A Squeak can be either a Rodent or a Trick.

Rodent: A unit card type that represents deployable creatures on the field.

Trick: A spell card type that provides various effects and abilities.

Tile: Individual pointy-top hexagonal spaces that comprise the game board.

Lair: The home base structure for each player. Destruction of all enemy Lairs results in victory.

Deployment Zone: The structure that Squeaks can be deployed to.

Crumbs: The resource points used to perform actions. Equivalent to mana or action points in other games.

Field: The active play area where Rodents are deployed and combat occurs.

3.2 Game Actions

Deploy: The action of placing a Rodent card onto the Field.

Defeated: A state in which a Rodent is removed from the Field due to combat or effects.

3.3 Progression System

Cheese: The currency resource used for purchases and gacha rolls.

Level: A progression metric that determines which Squeaks are available for forging.

Experience (EXP): Points earned after each game (win or loss) that accumulate to increase Level.

Forge: The act of combining two or more Squeaks to create a new Squeak variant (sidegrade).

Gacha: A randomized system for obtaining new basic Squeaks. Requires Cheese to perform.

3.4 Duration Effects

Last for 1 of ally turn: Effect expires and is cleared at the end of the current player's turn.

Last for 1 of enemy's turn: Effect expires and is cleared at the end of the incoming enemy turn.

3.5 Miscs

N-tile radius: AOE damage will act as if it has altitude value of N and reach of N

4 Game Mechanics

4.1 Pre-Match Phase

Prior to entering a match, players must build and select a deck (referred to as a "Squeak Set"). Additionally, players may designate the initial sequence of 5 "Squeaks" that will be drawn into their starting hand.

4.2 Match Phase

During each turn, players may execute multiple action types in any order, all of which consume "Crumbs" (with the exception of the "End Turn" action). The available actions are:

- Place Squeak
- Move
- Activate Skill
- End Turn

4.2.1 Place Squeak

Deployment Restriction: Rodent-type Squeaks are restricted to placement within designated "Deployment Zones". Conversely, Trick-type Squeaks may utilize specialized placement mechanics unique to them.

Squeak Draw Mechanism: Upon placement of a Squeak, the system automatically draws a new Squeak from the deck. Placed Squeaks are permanently removed from the active deck cycle. When an attempt is made to draw from an empty deck, the deck resets to its original composition.

4.2.2 Move

Terrain Navigation: Each tile possesses a distinct height value. Entities are capable of traversing elevation differences of up to 1 unit, with jumping automatically executed during movement when necessary.

Movement Resource: Each movement action consumes one unit of "Move Stamina", a resource unique to each entity. This stamina pool fully regenerates at the end of each turn. Most entities are not allowed to occupy the same tile at once.

4.2.3 Activate Skill

Skill Availability: Game entities, including "Rodents", usually has 0-3 "Skills". Players may activate "Skills" belonging to any allied or neutral entity.

Target Selection: Upon "Skill" activation, if the "Skill" requires target selection, the game enters "Target Selection Mode", prompting the player to select the appropriate target(s). Most "Skills" may be cancelled during this process. Note that certain Skills may require multiple target selection phases.

Line of Sight Calculation: The majority of "Skills" require direct line of sight (LOS) to their designated target. LOS determination follows this algorithm:

1. A direct line is drawn from the activating entity to the target
2. This line is interpolated into a hexagonal grid path (always selecting the shortest possible path)

3. The system calculates the height differential between the entity's tile and the target's tile
4. This differential is compared against the Skill's "Altitude" stats
5. If the "Altitude" value meets or exceeds the height differential, "LOS" is confirmed

Skill Resource: Upon successful "Skill" completion, one unit of "Skill Stamina" is consumed. This resource is entity-specific and fully regenerates at the end of the turn.

4.2.4 End Turn

This action forfeits all remaining "Crumbs" and immediately concludes the player's current turn.

4.3 Progression

4.4 Save File Structure

Players may maintain multiple save files, each with independent progression tracking.

4.5 Post-Match Rewards

Upon completion of a match (whether victory or defeat), players receive two primary reward currencies: Cheese and Experience Points (EXP).

Cheese: A currency utilized for "Gacha" system interactions. Each "Gacha" roll requires an expenditure of 10 Cheese.

Experience Points: Accumulated EXPcontributes to the player's Level, which serves as a prerequisite for unlocking new "Forges".

4.6 Level Progression

Player Level advancement requires progressively increasing amounts of EXP. The EXP requirement for each level follows a linear scaling formula:

$$\text{EXP Required} = 100 + 10(N - 1)$$

Where N represents the current level.

Example Progression:
- Level $1 \rightarrow 2$: 100 EXP
- Level $2 \rightarrow 3$: 110 EXP
- Level $3 \rightarrow 4$: 120 EXP
- ...
- Level $N \rightarrow N + 1$: $100 + 10(N - 1)$ EXP

4.7 Reward Calculation

Both Cheese and EXP rewards are calculated dynamically based on match duration (measured in turns played) using the following formula:

$$y = \left\lfloor A\left(\frac{x}{x + B}\right)\left(1 - e^{-\left(\frac{x}{C}\right)^2}\right)\right\rfloor$$

Where:

- x = number of turns played in the match
- A, B, C = reward-specific constants

4.7.1 Victory Rewards

Experience Points:
- $A = 200$
- $B = 20$
- $C = 80$

Cheese:
- $A = 20$
- $B = 20$
- $C = 80$

4.7.2 Defeat Rewards

Experience Points:
- $A = 100$
- $B = 20$
- $C = 80$

Cheese:
- $A = 5$
- $B = 20$
- $C = 80$

5 Rodent

5.1 Stats

HP (Hit Points): Amount of damage an entity can take before being defeated.

Speed: The maximum number of tiles an entity can traverse per movement action. Any unused "Speed" value is forfeited cannot be carried over.

Move Stamina: The number of movement actions an entity may perform per turn. The standard value is 2 for most entities.

Skill Stamina: The number of skill activation an entity may perform per turn.

Move Cost: The amount of crumbs required per 1 movement action.

Defense: Reduces incoming damage by a flat amount. Damage calculation follows the formula: `damage_taken = damage_received - defense` .

Crumb Cost: The amount of crumbs required to deploy the entity.

Attack: The base attack value from which skills' damage is derived.

Height: Entities may function as cover for enemy's line of sight calculations. This value is added to the tile's base height when determining cover effectiveness. Most entities have height of 0.

5.1.1 Skills

Reach: Defines the maximum tile distance a skill can reach its target.

Altitude: Specifies the maximum height differential that a skill can overcome. This value may be negative. For example, a skill with an altitude of 1 can target enemies positioned behind cover or on the tile that is 1 height unit above the activating entity.

Crumb Cost: The amount of crumbs required to activate the skill.

5.2 Classes

Rodent's classes are merely classifications and suggestions on how the rodent should be played. However, some abilites whether passive or activate may target a specific class.

5.2.1 Vanguard

Low-cost, expendable Rodents designed for deployment during the early phases of a match. These units are typically weaker.

5.2.2 Tank

Defensive Rodents with height, enabling them to provide cover for allied units. These rodents have higher defense and health.

5.2.3 Specialist

Unique Rodents with unconventional mechanics or playstyles that defy standard classification.

5.2.4 Support

Utility-focused Rodents that can buff or heal allies. They can also debuff enemies.

5.2.5 Duelist

Offensive Rodents optimized for high damage output.

6 Rodent List

7 Gacha Pool

8   Forges