

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 EXP contributes 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 → 2: 100 EXP
- Level 2 → 3: 110 EXP
- Level 3 → 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 abilities 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

6.1 Vanguard

6.1.1 Tailblazer

The rodent that will never deny a call for adventures.

- HP: 10
- Defense: 2
- Speed: 8
- Move Stamina: 2
- Skill Stamina: 2
- Attack: 3
- Move Cost: 3
- Height: 0
- Crumb Cost: 7

Skills

1. Stab: Stab an enemy with a toothpick dealing ATK+1 damage.
 - Reach: 2
 - Altitude: 0
 - Crumb Cost: 3
2. Spear Launching: Throw a toothpick at an enemy dealing ATK damage.

Passives

1. Pioneer: When placed, if there's no other ally rodents on the field, gain +2 speed until the turn after there's one.

6.1.2 Tailtrail

(Tailblazer)

- Defense: 4
- Attack: 2
- Height: 1

Skills

1. Stab

6.2 Tank

6.2.1 Cracker

Reliable rodent using cracker as its shield. It'll defense its friends at any cost.

- HP: 9
- Defense: 5
- Speed: 8
- Move Stamina: 2
- Skill Stamina: 3

- Attack: 3
- Move Cost: 2
- Height: 2
- Crumb Cost: 19

Skills

1. Bread Slap: Slap your enemy with bread dealing ATK damage.
 - Reach: 1
 - Altitude: 0
 - Crumb Cost: 3
2. Abandon Bread: Throw away the cracker reducing defense to 0 and height to 1 until defeated. Increase speed by 12. Can only be used once per deployment.
 - Crumb Cost: 1

Passives

1. Bread Good: Heal 1 HP per at the start of your turn when there is at least 1 ally within 3 tiles.

6.3 Duelist

6.3.1 Ratbert Brewbelly

A bloated, beer-stained brown rat with bloodshot eyes and a sloshing belly who waddles unsteadily through combat. Armed with projectile vomit attacks that stun enemies with some damages.

- HP: 7
- Defense: 1
- Speed: 3
- Move Stamina: 2
- Skill Stamina: 1
- Attack: 3
- Move Cost: 8
- Height: 0
- Crumb Cost: 19

Skills

1. Projectile Vomit: Launches chunky bile that ‘stuns’ enemies on impact for 2 turns, dealing ATK+3 on the first turn and ATK/2 on the second turn.
 - Reach: 6
 - Altitude: 0
 - Crumb Cost: 10

Passives

None

6.3.2 Soda Kabooma

No idea what it is doing here, but it was told to hold this soda can, and hold the soda can it will.

- HP: 9
- Defense: 5
- Speed: 2
- Move Stamina: 2
- Skill Stamina: 1
- Attack: 1

- Move Cost: 2
- Height: 0
- Crumb Cost: 25

Skills

1. Shake the Can: Shakes the soda can to make it explode, dealing $ATK \times 2 + 1$ damage to all rodents (including its allies) in a 2-tile radius. This rodent is then defeated afterwards.
 - Crumb Cost: 5

Passives

None

6.3.3 Pea Pea Pool Pool

A rodent in a pool with a gun. That is if a cup of water can be called pool and a pea can be called a gun.

- HP: 10
- Defense: 2
- Speed: 10
- Move Stamina: 2
- Skill Stamina: 3
- Attack: 4
- Move Cost: 3
- Height: 0
- Crumb Cost: 14

Skills

1. Pea: Shoot the peas inside the pod at an enemy dealing $ATK/2$ damage twice.
 - Reach: 12
 - Altitude: 1
 - Crumb Cost: 5

Passives

None

6.3.4 Mortar

A coward with an access to artillery strike.

- HP: 12
- Defense: 3
- Speed: 3
- Move Stamina: 2
- Skill Stamina: 2
- Attack: 5
- Move Cost: 2
- Height: 0
- Crumb Cost: 32

Skills

1. Artillery Strike: Launch the artillery at any tile damaging all enemy within 2-tiles radius dealing $ATK + 4$ damage.
 - Reach: 7
 - Altitude: 3
 - Crumb Cost: 10

2. Artillery Strikes: Launch multiple artilleries at any tile damaging all enemy within 3-tiles radius dealing ATK+8 damage.
 - Reach: 7
 - Altitude: 3
 - Crumb Cost: 30

Passives

1. A Coward: After taking damage, gain 100% speed for 1 turn.

6.3.5 Rail Rodent

A little over confident rodent that happens to have giant weapon of mass destruction in its hands.

- HP: 7
- Defense: 3
- Speed: 3
- Move Stamina: 2
- Skill Stamina: 1
- Attack: 10
- Move Cost: 3
- Height: 0
- Crumb Cost: 25

Skills

1. Railgun Charge: Charge its railgun and give itself “Railgun Charged” status effect for 3 of ally turn.
 - Crumb Cost: 20
2. Railgun: If it has “Railgun Charged” status effect, fire the railgun at an enemy dealing ATK*2 damage and clear said effect.
 - Reach: 20
 - Altitude: 0
 - Crumb Cost: 5

Passives

1. High Ground: When being at higher tile than the target, reach of all skills +1.
2. Too OP: This rodent cannot attack any structure.

6.3.6 Clanker

Rail Rodent

- HP: 3
- Defense: 999
- Speed: 2
- Move Stamina: 1
- Skill Stamina: 2
- Attack: 20
- Move Cost: 20
- Height: 0
- Crumb Cost: 20

Skills

1. Pancakes!: Clanker stabs his opponent with his pancake fork dealing ATK damage.
 - Reach: 2
 - Altitude: 0
 - Crumb Cost: 10

Passives

None

6.4 Support

6.4.1 Quartermaster

Live with honor and die with honor. Army marches on its stomach. It'll continue to distribute these supplies until it has drawn its last breath.

- HP: 5
- Defense: 0
- Speed: 1
- Move Stamina: 2
- Skill Stamina: 1
- Attack: 10
- Move Cost: 20
- Height: 0
- Crumb Cost: 19

Skills

1. My Body: Boost an ally's morale by giving them "Morale Boost" status effect increasing its attack by 1 for 3 of ally turns.
 - Reach: 1
 - Altitude: 10
 - Crumb Cost: 3
2. My Heart: Distribute food to an ally healing it by ATK HP.
 - Reach: 1
 - Altitude: 1
 - Crumb Cost: 10
3. My Soul: Its last breath has come. Give "Quartermaster's Soul" status effect to an ally rodent. When activated again, said rodent will deal ATK damage to all enemy within 2-tile radius and this rodent will then be defeated.
 - Reach: 3
 - Altitude: 10
 - Crumb Cost: 12

Passives

None

6.5 Specialist

6.5.1 Mayo

With its mighty squeeze bottle, sky's the limit. It can achieve unrivaled mobility. Its attack, however, is sub-optimal.

- HP: 10
- Defense: 2
- Speed: 10
- Move Stamina: 4
- Skill Stamina: 2
- Attack: 0

- Move Cost: 2
- Height: 0
- Crumb Cost: 7

Skills

1. Rocket Boost: Move 1 tile in any direction. Can go up to 5 height unit.
 - Reach: 1
 - Altitude: 5
 - Crumb Cost: 2

Passives

1. Escape Manuever: 20% to dodge an attack from enemy at least 5 tiles away.

6.5.2 The One

The strongest rodent in history. A one who has never known fear.

- HP: 30
- Defense: 2
- Speed: 10
- Move Stamina: 1
- Skill Stamina: 3
- Attack: 3
- Move Cost: 15
- Height: 2
- Crumb Cost: 50

Skills

1. The Punch: The mission is to destroy the enemy. There's no cover that can stop this rodent. Deal ATK*6 damage.
 - Reach: 1
 - Altitude: 99
 - Crumb Cost: 20
2. Brace: Gain +5 defense for 1 of the enemy's turn.
 - Crumb Cost: 5

Passives

1. Hope and Dream: All allies within 3-tiles radius gain +2 defense
2. Lonely: Cannot regain HP through any mean and only 1 The One can be on the field at any given time.

7 Trick List

7.1 Offense

7.1.1 Sundial

Summon Sundial If not destroyed within 5 of enemy's turn, explode and set every of your lair's health to 1 and kill every entity in the field. (Cannot work if every lair's health is already 1)

- Crumb Cost: 30

Related Entities

7.1.1.1 Sundial

The ultimate last resort. The sign of true desperation. If not destroyed within 5 of enemy's turn, explode and set every of your lair's health to 1 and kill every entity in the field. (Cannot work if every lair's health is already 1)

- HP: 5
- Defense: 0

Passives

1. Explosion: Explode in 5 of enemy's turn killing every entity in the field and set every of your lair's health to 1.

7.2 Defense

7.3 Utility

8 Common Effects

8.1 Slowed

Reduce movement speed by <intensity>.

8.2 Stunned

Become unable to move or use skill.

8.3 Poisoned

Take <intensity> damage every of your turn.

8.4 Bleeding

Take <intensity> damage on application and take <intensity> damage every of enemy's and your turn.

8.5 Morale Boost

Increase attack by <intensity>.

9 Gacha Pool

Squeak Name	Weight
Tailblazer	1
Mayo	0.5
Cracker	2
Pea Pea Pool Pool	1
Ratbert Brewbelly	1
Soda Kabooma	1
Mortar	1
Rail Rodent	1
The One	0.1
Quartermaster	0.5
Clanker	0.7
Sundial	0.1

10 Forges

- $10 \times \text{Tailblazer} + 1 \times \text{Cracker} \rightarrow \text{Tailtrail}$

11 UI



