

## Pairs Game - Design Plan

### Game Overview

The Pairs Game is a level-based card-matching game where users advance by correctly identifying matching cards within a set time. The game includes penalties for wrong attempts and exceeding the allotted time while rewarding correct matches with points.

### Game Mechanics

- **Base Score:** Players start with a base score of **500 points**.
- **Timer:** Each level has a designated time limit. Once exceeded, a **penalty of -10 points** is applied for every **10 seconds lost**.
- **Matching Rules:**
  - **Levels 1-5:** Match **2 cards**.
  - **Levels 6-10:** Match **3 cards**.
  - **Levels 11-15:** Match **4 cards**.
  - **After Level 15:**
    - Card count increases by **2** per level.
    - The game mode (3-card or 4-card match) depends on the **divisibility of the total number of cards**.
    - If the total number of cards for a level is not divisible by either 3 or 4, an adjustment of  $\pm 1$  will be applied to ensure divisibility. This ensures the game remains scalable and progresses smoothly without irregular card distributions.
    - Example: Level **16** has **52 cards**, which is divisible by **4**, making it a **4-card match** round. Another example is, at level 25, the initial total card count is calculated as  $52 + (25 - 16) * 2 = 70$ . Since 70 is not divisible by 3 or 4, it is adjusted to 69, which is divisible by 3.

### Penalties & Bonuses

Level Range	Wrong Attempt (-)	Right Attempt (+)
Levels 1-5	-10	10
Levels 6-10	-10	15
Levels 11-15	-15	25
Level 16+ (3-match)	-10	15

Level 16+ (4-match)	-15	25
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### **Timer System**

#### **Fixed Timer for Levels 1-15:**

Level	Time (Seconds)
Level 1	20s
Level 2	30s
Level 3	40s
Level 4	50s
Level 5	60s
Level 6	120s
Level 7	135s
Level 8	150s
Level 9	165s
Level 10	180s
Level 11	190s
Level 12	210s
Level 13	230s
Level 14	250s
Level 15	270s

#### **Dynamic Timer for Levels 16+:**

The time is calculated based on the following formula:

**(Base Time + (Total Cards \* Time per Card)) \* Difficulty Factor**

#### **Time Calculation Factors:**

- **Base Time:**
  - **3-card match:** Total cards \* 6
  - **4-card match:** Total cards \* 7
- **Time per Card:**
  - **3-card match:** 5 seconds per card
  - **4-card match:** 7 seconds per card
- **Difficulty Factor:**

- **3-card match: 1.0**
- **4-card match: 1.5**

### **Game Limitations**

- **Not scalable for many users** as the game relies on **session variables** and a **JSON string** to store game data.
- Two users can have the same name. The username uniqueness is not checked for, in the input validation or any other stages of the game.
- Users **cannot replay a level once submitted**. They automatically progress to the next level without the option to go back.
- **During an ongoing game, users cannot pause or restart**. To stop and restart, they must reload the page. However, a replay button is available once the game is completed.
- Once a user logs in, there is no option to log out during the session. The username and avatar are set at login and cannot be modified or changed afterward.

### **Credits and acknowledgements**

- The avatar images used in register.php, located in the /images directory, are sourced from Freepik ([www.freepik.com](http://www.freepik.com)).