Bouncing Fish (CMPM 120 – Project 4)

Team: Liya Zhu & Alexander Bateman

Game Overview

Bouncing Fish is a single player physics-based arcade game made in Phaser.

The player controls a **fishnet paddle** at the bottom of the screen and indirectly controls a bouncing **player fish**. The goal is to eat smaller fish to grow larger, avoid bigger fish that damage you, and reach the maximum size before you fall into the void or lose all health.

The game is in the **physics-based game** category.

How To Play

Controls

- Move paddle left: Left Arrow or A
- Move paddle right: Right Arrow or D
- On Game Over screen: ENTER to play again

The player fish moves and bounces automatically. You only move the paddle.

Core Rules

- You start at **Size 1** with a certain amount of health.
- When you collide with a **smaller fish**, you eat it:
  - You gain score (size of fish × 10).
  - If the fish is the same size as you, it counts toward leveling up.
- When you collide with a **bigger fish**, you take damage:
  - You lose 1 HP.
  - You briefly become invincible.
- If your health reaches 0, or your fish hits the **bottom of the screen**, you lose.
- When you reach **max size (Size 6)**, the camera shakes, a win banner appears, and the game ends in a win state.

Technical / Design Highlights

- **Physics and collisions**
  - Uses Arcade Physics for the player fish, enemy fish, paddle, and powerup.
  - The paddle only collides from above and acts like a Brickout paddle.

    - The bounce angle depends on where the fish hits the paddle (left, center, right).
- **Enemy fish**
    - Fish spawn at random heights from left or right.
    - There are six size levels with different sprites.
    - Smaller fish swim faster, bigger fish swim slower.
    - Fish bounce off world bounds and wrap around horizontally.
- **Progression and difficulty**
    - The player has a sizeLevel from 1 to 6.
    - Eating same-size fish increases a counter. When the requirement is met, sizeLevel increases.
    - Each same-size fish eaten also increases a playerSpeedBonus, which is used when computing the bounce speed on the paddle, so the fish gets faster over time.
- **Powerup**
    - A powerup periodically spawns and bounces around.
    - When collected, it plays a sound and temporarily slows all enemy fish by scaling down their horizontal velocity, then restores it after a delay.
- **Feedback and polish**
    - HUD shows **Health**, **Size**, **Score**, and **Level**.
    - Eating a fish plays a sound and a quick visual effect at the collision point.
    - Taking damage shows floating "-1 HP" text and plays a separate sound.
    - Winning triggers camera shake and a "You Win" banner.
    - Game Over screen shows the final score and prompts the player to press ENTER to restart.

Self-Evaluation Against Our Rubric

Rubric Item and how we met it

1. **Use of gravity and physics (2 pts)**
    - Player fish, paddle, enemy fish, and powerup all use Arcade Physics.
    - The paddle is immovable, has a custom hitbox, and the fish bounces off it with custom bounce logic that depends on impact position.
2. **Use of collision (1 pt)**
    - Collision between player fish and enemy fish decides eat vs. damage.
    - Eating smaller fish destroys the fish, increases score, and drives growth.
    - Hitting bigger fish reduces health and triggers feedback effects.
3. **Use of path finding (2 pts)**
    - We did not implement a full pathfinding algorithm.
    - Instead, enemy motion is handled through horizontal physics movement, bounce, and wraparound.
    - For this goal we would self-assess **0 / 2 points** and note that we chose to invest that time into powerups and polish instead.
4. **Powerups (1 pt)**
    - Implemented a slowdown powerup:

        - Spawns periodically.
        - Can be collected by the player.
        - Slows all enemy fish for a fixed duration and plays a pickup sound.
5. **Win/Loss conditions (1 pt)**
    - **Win**: reach max size (6). The game shows a win banner, camera shake, and transitions to a Game Over screen with a win result.
    - **Lose**: either HP reaches 0 from bigger fish or the player hits the bottom world bound.
6. **Individual Liya: Art/tiles/visual (1 pt)**
    - Integrated a background, fish sprites, paddle sprite, powerup sprite, and a special FX sprite for eating, creating a coherent visual style.
7. **Individual Liya: Collectible pickup sound (1 pt)**
    - The slowdown powerup has its own pickup sound effect.
8. **Individual Liya: Visual and audio feedback (1 pt)**
    - Eating a fish spawns a short visual burst effect and plays a sound.
    - Taking damage triggers a sound and floating damage text.
9. **Individual Alex: UI element Score (1 pt)**
    - Score is displayed in the HUD and on the Game Over screen.
    - Score value is based on the size level of fish eaten.
10. **Individual Alex: Camera shake when level completed (1 pt)**
    - On reaching max size, the camera shakes and a win message appears before transitioning to the Game Over screen.
11. **Individual Alex: Increasing level difficulties (1 pt)**
    - Each time the player eats a same-size fish, a speed bonus is increased and used in the paddle bounce calculation, making the fish faster and the game harder as you progress. We implemented the variables and logic for increasing speed, but due to time and tuning issues the player speed doesn't noticeably change. We would not claim full credit for this goal.

All assets sourced from Kenney.pl