# ****Test Plan: Maze Jumper****

## ****1. Test Objectives****

* Verify that all game mechanics (movement, jumping, hazards) function as intended.
* Ensure all animations and character states are triggered correctly.
* Test each level’s collision boundaries, hazards, checkpoints, and end goals.
* Check for edge cases and unintended behaviors.

## ****2. Test Environment****

* **System**: Windows 10, macOS, and Linux
* **Browsers**: Chrome (latest version), Firefox, Safari, Edge
* **Resolution**: Minimum 1024x768
* **JavaScript**: Enabled
* **Testing Tool**: Manual testing with developer console logs for real-time feedback

## ****3. Test Cases****

### ****3.1. Movement Testing****

| **Test Case** | **Expected Behavior** | **Result** |
| --- | --- | --- |
| Move Left (A key) | Geeb moves left at a consistent speed. | Pass/Fail |
| Move Right (D key) | Geeb moves right at a consistent speed. | Pass/Fail |
| Jump (Spacebar) | Geeb jumps with correct strength and falls with gravity. | Pass/Fail |

### ****3.2. Collision Testing****

| **Test Case** | **Expected Behavior** | **Result** |
| --- | --- | --- |
| Wall Collision | Geeb stops movement when colliding with a wall. | Pass/Fail |
| Hazard Collision | Geeb loses a life when hitting a hazard. | Pass/Fail |
| Floor Collision | Geeb lands correctly and no longer falls. | Pass/Fail |
| Trigger Collision (Coin) | Coin disappears when Geeb collects it. | Pass/Fail |
| Trigger Collision (Life) | Extra Life disappears and Geeb gains one life. | Pass/Fail |

### ****3.3. Hazard Behavior Testing****

| **Test Case** | **Expected Behavior** | **Result** |
| --- | --- | --- |
| Sine Hazard Movement | Sine hazard moves smoothly in a sine pattern. | Pass/Fail |
| Circular Hazard Movement | Circular hazard rotates around a fixed point. | Pass/Fail |
| Wave Hazard Movement | Wave hazard moves smoothly in wave pattern. | Pass/Fail |

### ****3.4. Checkpoint and End Goal Testing****

| **Test Case** | **Expected Behavior** | **Result** |
| --- | --- | --- |
| Checkpoint Trigger | Geeb respawns at the checkpoint after collision. | Pass/Fail |
| End Goal Trigger | Next level unlocks and win screen displays. | Pass/Fail |

### ****3.5. Edge Case Testing****

| **Test Case** | **Description** | **Expected Behavior** | **Result** |
| --- | --- | --- | --- |
| Continuous Jumping | Pressing jump repeatedly without landing. | Geeb should not be able to jump mid-air | Pass/Fail |
| Multiple Hazards Overlap | Geeb encounters multiple hazards simultaneously. | Geeb should only lose one life. | Pass/Fail |
| Camera Boundaries | Geeb reaches the edge of the screen. | Camera should follow Geeb correctly. | Pass/Fail |
| Coin Overlap with Walls | Coin appears inside a wall collider. | Coin should not be collectible. | Pass/Fail |
| Negative Position Testing | Geeb moves out of the defined map area. | Geeb should respawn correctly. | Pass/Fail |
| Life Count Overflow | Collecting lives beyond max (3) | Geeb’s lives should not exceed 3. | Pass/Fail |
| Level Restart | Restarting the level mid-game. | All elements reset to initial state. | Pass/Fail |

## ****4. Testing Schedule****

1. **Movement Testing**: Day 1
2. **Collision and Hazard Testing**: Day 2
3. **Checkpoint and Goal Testing**: Day 3
4. **Edge Case Testing**: Day 4
5. **Final Integration Testing**: Day 5

## ****5. Known Issues and Fixes****

**Issue**: Geeb occasionally passes through platforms during high-speed movements.

**Solution**: Implement velocity clamping and finer collision detection, also additional colliders.

**Issue**: Hazard patterns sometimes desynchronize after pausing.

**Solution**: Add a reset timer to hazards on pause events.