Physical Prototype Report

Introduction

Translating our game concept onto a physical prototype proved to be difficult, since the core gameplay revolves around a physically based fluid simulation.

In order to produce a playable prototype, we had to make some concessions and modelled the game world as a tile based landscape, in which water is represented by blue thumb tacks that move from tile to tile using simple rules.

Gameplay

The player is presented with the printed out level on a sheet of paper, which shows stone, dirt and air tiles as well as the water inflow. Diggable dirt tiles are represented by a light textured background, and the player is able to “dig” these tiles by crossing them out using a pen.

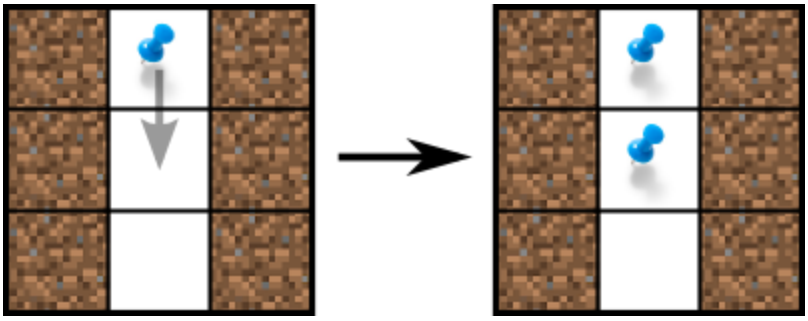
The player can take as long as they want to modify the terrain. Once they are satisfied, they tell the “computer” to run the simulation, that is, placing the thumb tacks according to the rules, starting from the inflow. Some items in the level interact with water, and the “computer” announces those interactions accordingly.

If the level is won, the player receives a pat on the back. If not, the thumb tacks are removed and the player gets a chance to do more modifications and try again.

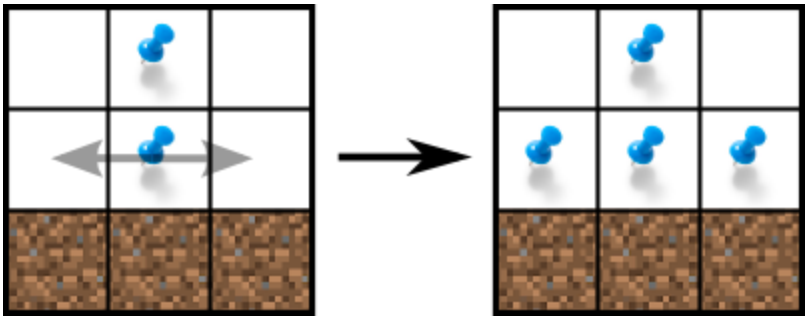
Water behaviour

The behaviour of the water is governed by four simple rules:

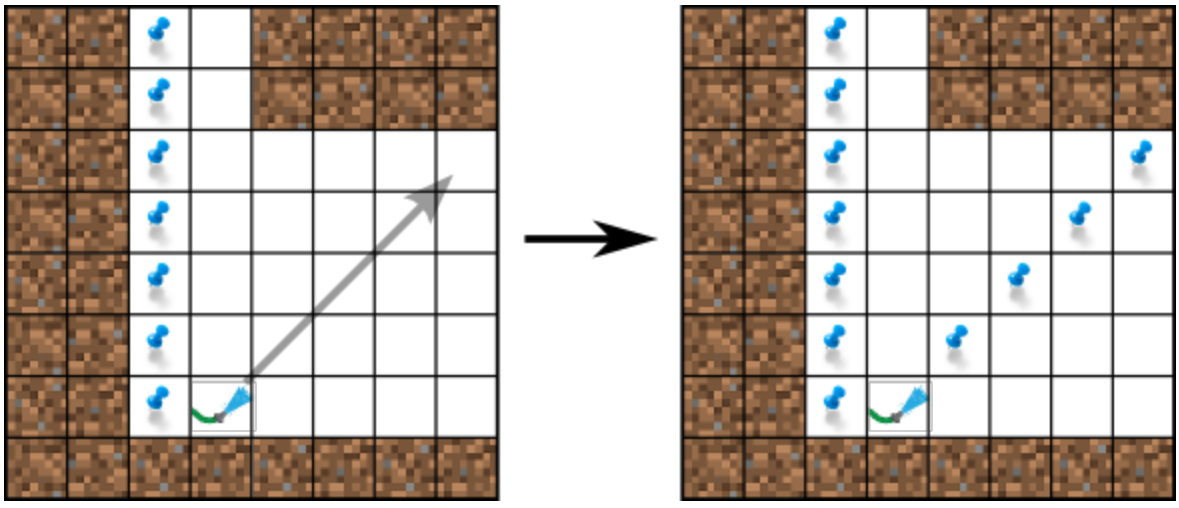
- If the tile below a water tile is empty (filled with air), then water will only spread down



- If the tile below a water tile is occupied and tiles at either side are empty, then water will spread sideways



- If a water tile hits a pump, it will spread along an upward diagonal line for five tiles or until it hits a wall, whichever is sooner



- If the tiles below, left and right to a water tile are occupied by walls or other water tiles, the water stops - there is no inertia.

Game elements

To keep things simple, only a select few of the planned game elements are represented in the physical prototype. These elements are

- Season changers: These are necessary to win the game and are represented as textured tiles. They count as activated if a water tile spreads onto a season changer tile.

- Switches and gates: Both gates and switches are simple textured tiles on the grid. When water spreads on top of a switch tile, the corresponding gate tile is removed. Gate tiles are the only item tiles that can block the flow of water.

- Pumps: When touched by water, these tiles eject water along a diagonal upward line for a certain number of tiles.

Conclusion

Creating the prototype

Making the prototype turned out to be quite difficult, since the core game mechanics don't translate well onto a physical medium, lest we create a prototype consisting of actual dirt and allowing the player to pour glasses of water into it.

In the end we had to replace the water with a more abstract representation (the thumb tacks) so that the prototype was doable within the timeframe.
Ultimately it feels like, rather than making a prototype of our game, we had to create a completely different game that works on a physical medium to fulfill this task. The value of the insights we gained from completing this part of the project is questionable.

Playing the game

The prototype is playable and the basic game elements (switches, gates, seasons, pumps) are in there, but the game is not very fun - the part of the game that requires skill (controlling the water) is mostly missing, since the physical version is very simple and deterministic. Therefore, solving the puzzles provides not much of a challenge.

Unfortunately, this is a consequence of the physical prototype, and does not translate back onto our game concept.