

# Project HexaCore

Game Design Document

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# Introduction

This document details the design for HexaCore (working title) and is meant to be constantly updated during development. HexaCore is a puzzle game in which the player completes line puzzles on a hexagon grid. The game relies on intrinsic motivation forgoing almost any reward structures. Solving puzzles relies on a mix of logic and spatial reasoning skills that the player will build up during the game. The aim of this project is to release a commercial game for mobile devices and pc.

All graphics in this document are placeholders and only serve to illustrate the concepts that they represent. Names in this document stem from code and are not playerfacing. We plan not to use descriptors or written language in-game; only icons where they are required. This is both to keep the scope of this game small and provide a more universal way of communicating game function.

## Goal of the Game

In HexaCore, the player's goal is to power all the endpoints in order to progress to the next level. This goal is achieved by transporting and transporting resources from start points with factories placed and paths drawn on the game board.

## Target Audience

HexaCore is suitable for all ages although in practise, its relative difficulty will restrict the audience to a subset of players that are more naturally interested in puzzle games. While the game is suited for all ages, we do not specifically cater to children. To increase our target audience, we try to rely on icons and non-written/spoken tutorials. Research indicates that the market for puzzle games on mobile is split 60 / 40 male / female demographics. To prevent preconceived notions about our target audience, we try to keep the visuals as 'gender neutral' as possible.

# Game Elements

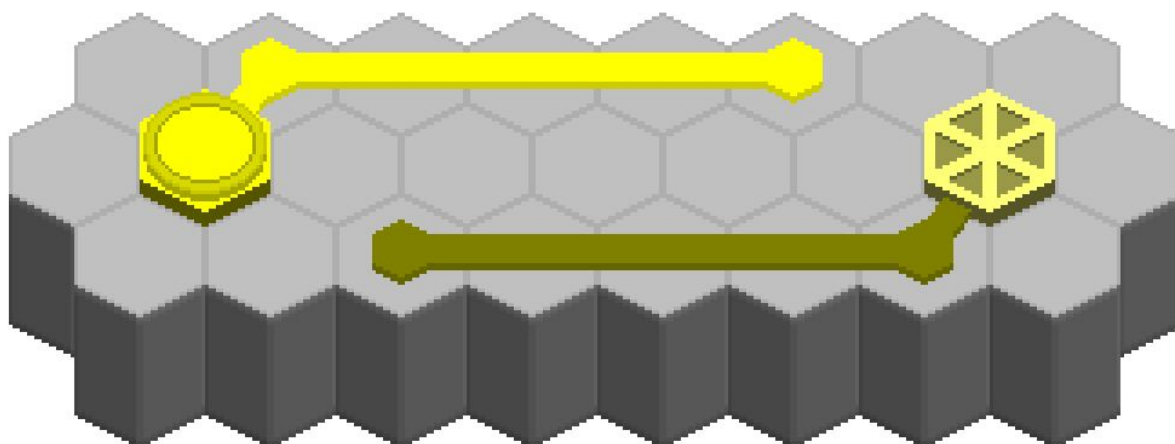
## Resources

There are 7 resources in the game. Sources in the game 'give' a resource, Requesters 'receive' a resource and paths and gates transport a resource. The players solve a puzzle by providing the requested resources to the objective(s).

Each of the six resources correspond to a colour:

0. White
1. Yellow
2. Magenta
3. Cyan
4. Red
5. Blue
6. Green

The white resource is special in that, when it connects to another resource, it becomes that resource type. This is in effect no matter what holds the white resource. For instance, an unconnected path has the white resource and will take on the resource of whatever it connects to.

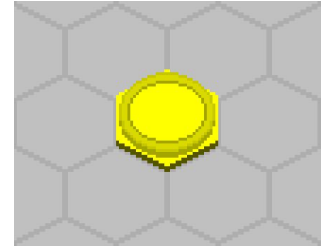


An object (non-level sources, requesters, teleporters and paths) can have a resource and still be unpowered. 'Power' is granted by a source, which can power an unlimited amount of other objects as long as they are connected.

## Source

A source:

- Provides unlimited resources of a single energy type.
- Can be powered or unpowered. Unpowered sources (part of a factory) do not provide energy.



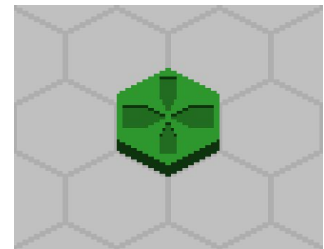
Every level starts with one or multiple powered sources. Players use these as starting points for the puzzle.

Unpowered sources can be placed by the player as they are part of factories. By powering the factory, the source will also be powered. More on that in the factory section.

Sources are a path element. More on that in the path section.

## Requester

A requester requires energy of the same energy type transferred to power it. It always starts unpowered.



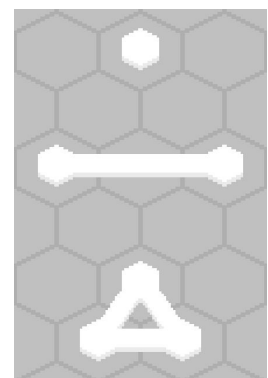
Every level starts with one or multiple requesters. The level is completed when all these requesters are powered.

The player can place factories, requesters are part of factories. When all the requesters of the factory are powered, the factory itself will be powered. More on that in the factory section.

Requesters are a path element. More on that in the path section.

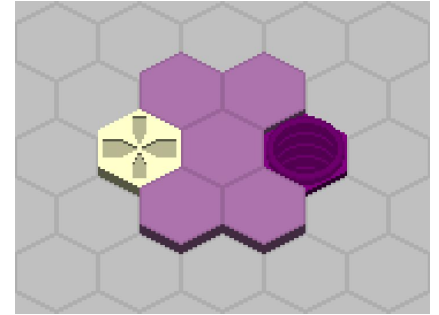
## Path

Paths are used to transfer energy. They can be placed on any empty tile. Path neighbors will connect to each other if they transfer the same energy type. If a path is connected to a source, the entire path will transfer the source's energy type. When this path is connected to a requester with a matching energy type, the requester will be powered. All path elements transfer the energy to any other connected path. As mentioned, requesters and sources are themselves a path element.



## Factories

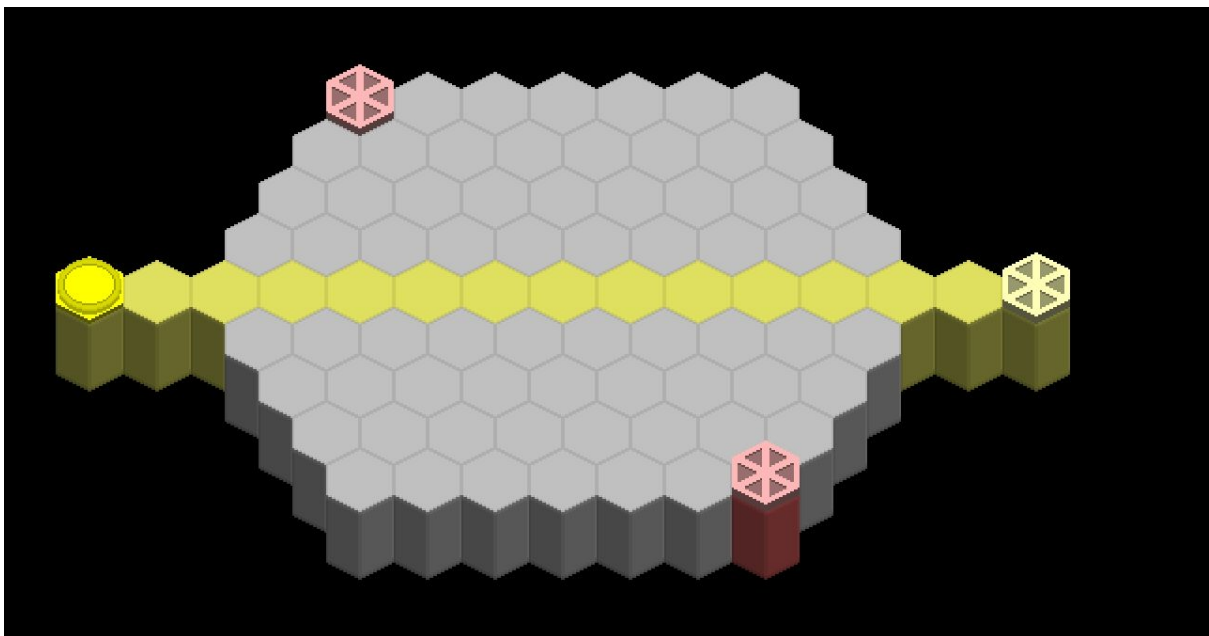
Factories consist of one or multiple unpowered requesters, one or multiple unpowered sources and filler tiles. When the player powers all requesters, the factory itself is powered. When the factory is powered, all of the sources will be powered. This can result in energy type converts as the sources can provide different energy types than the requesters require. Factory tiles block boardspace and do not transfer resources.



## Restrictive Ground Hexes

To increase the design space of the level design, ground hexes can be restricted to allow paths / requesters / sources of only 1 resource type. This also helps with teaching players the game.

Restrictive Ground Hexes limit the placement of paths, requesters and wells by the players to their resource. Factory tiles can be placed on restrictive hexes and can be used to 'bridge' a continuous line.

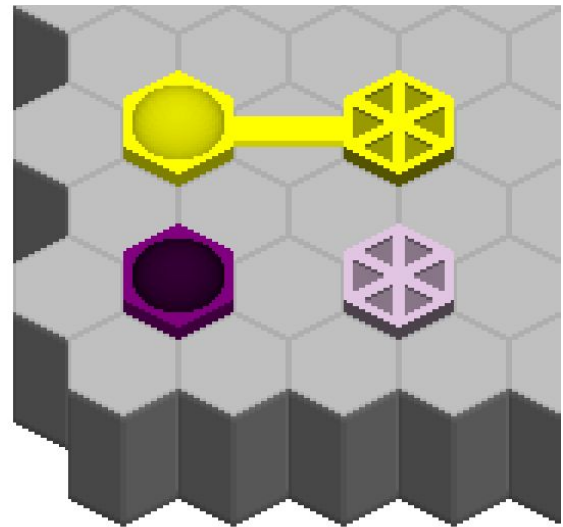
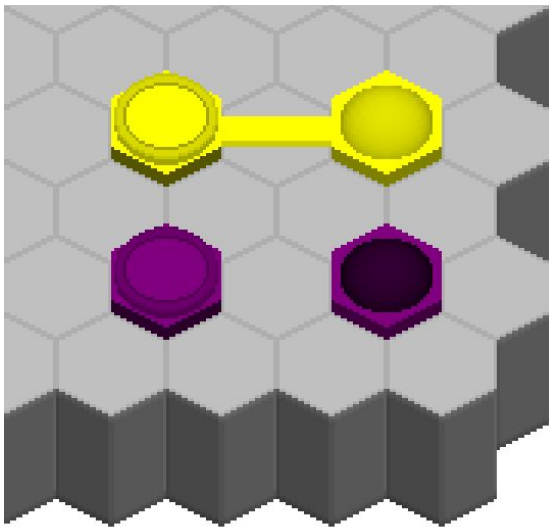


## Gates

Gates are elements that can 'teleport' a resource between them. Gates can be restricted to one resource type or be unconnected, in which case the player can connect any resource to that gate.

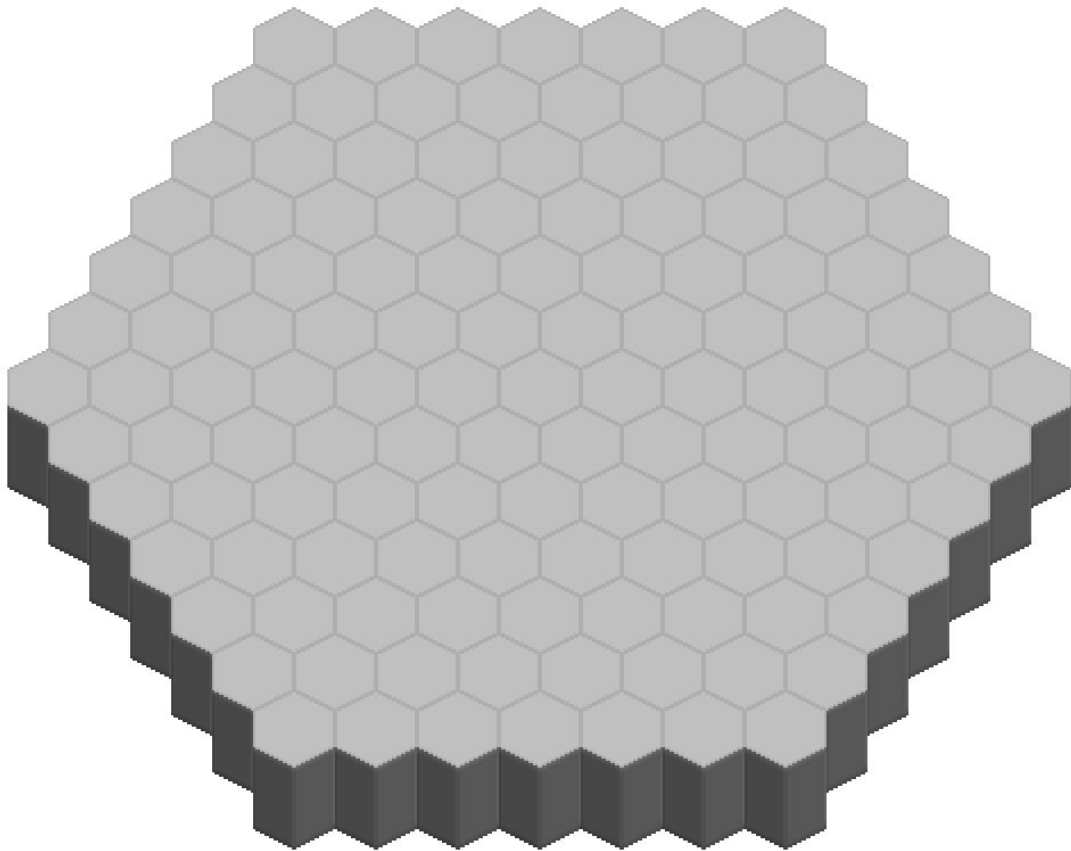
Gates serve as sources if they are connected to a source. Gates can be part of factories or the level. If gates are part of a factory, they only 'enable' when the factories requesters are fulfilled. This means that gates on unfulfilled factories do not transmit an incoming valid resource or output an resource.

All gates of a resource in the level are connected to each other. This means that once a gate is connected to a source, every gate of the same resource now acts as a source. If a gate that is not restricted to a resource is connected to a source, every unrestricted gate in the level outputs that resource. 'White' gates or gates with no resource are not connected to other resource gates when they carry the same resource. This means that it is possible for gates of type 1 (yellow) to be active and gates of type 0 (white) - that are connected to resource 1 - to be inactive and vice versa.



# Level Design

## The Board



The game board consists of an array of individual hex pillars. These pillars can be arranged differently to create a board.



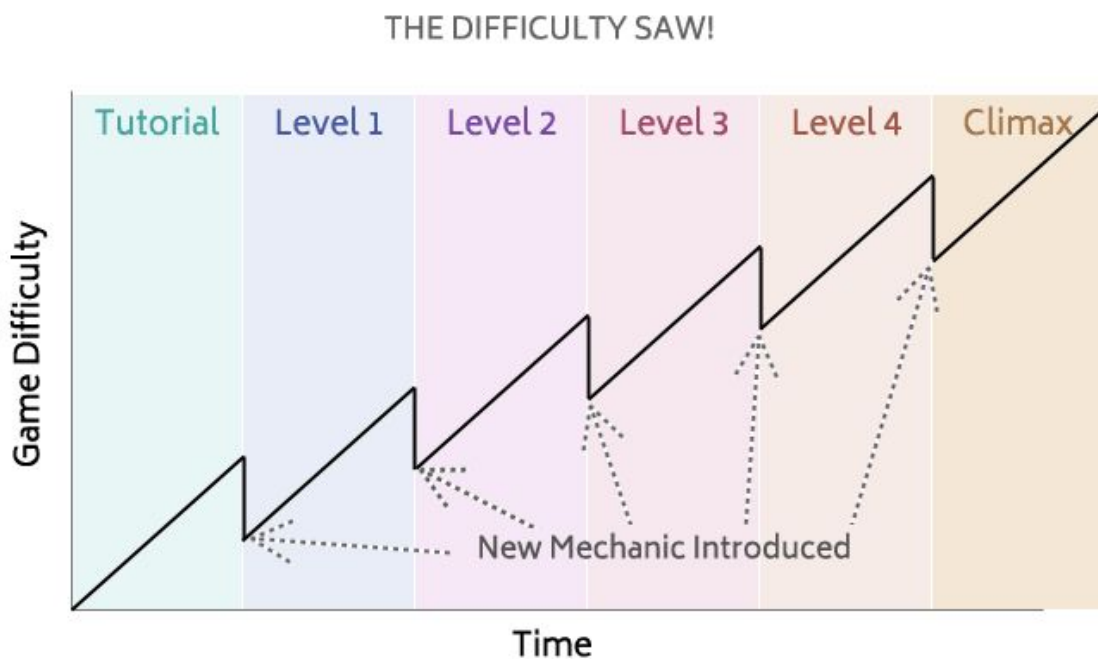


## Difficulty by level design

In general, the difficulty of a puzzle depends mostly on the size of the level relative to the amount of factories that the player needs to place. The less 'spare' space there exists in a level, the less solutions a puzzle has and the harder a puzzle becomes to solve.

The difficulty is further enhanced by levels that do not overly restrict the placement of factories. The placement of the well and the objective further restrict the construction space for the player and can increase the difficulty.

The target for our difficulty curve looks like a saw pattern:



This means that difficulty gradually increases until a new mechanic is introduced.

### Level groups by introduced mechanics

We have several sets of levels, grouped by an introduced mechanic. For instance, when we introduce the gates, we have a set of levels that tutorialize and explore the concept of gates.