

CodeWiz: The Board game.

CodeWiz is a board game that centers around teaching the player the logic of programming which can be transferred and used in any form of programming language. CodeWiz does not require any preexisting programming knowledge. Programming or coding at its base level is simply the way one goes about telling a computer what to do using instructions that the computer understands (MyLab Programming | Pearson, 2020). CodeWiz basically replaces the words used in programming with icons that are signifiers of its function and because of this symbolism anyone would be able to pick up and play the game. As long as both the game and the player understand what the icon means the player can theoretically create any program using icons as a replacement for the programming language, one can think of it as a substitute, example: instead of using the words such as left, right, forward, back, we can replace this using the arrows symbols that signify the same thing. If one can comprehend that then one can see the limitless potential something so simplistic can bring, especially if one sees that the icons can be translated into any programming language and serve the same function. Whether one is using instructions in words or icons, they are essentially programming.

Programming is the present and the future, with the introduction of the 4<sup>th</sup> industrial revolution and the increase in automation there has been a shift of importance of skills. We live in an era where nearly everything is mediated through computers and software, not having a “liberate” understanding of how these systems function, leaves one vulnerable to exploitation by those who do understand and control it. It is therefore important that we learn computational thinking, more than just being able to tell a computer what to do, programming teaches you how to think and solve real world problems (MyLab Programming | Pearson, 2020). Now data is the most valuable commodity, yet it is not physical, it is generated through computers and we are controlled by it. It only makes sense that teaching children how to program is fundamental to their understanding of how these things work to prevent exploitation.

Games are the perfect medium to teach programming to children, the reason being is because they are a high interest for kids and engaging enough to keep their attention. Computer games may have the upper hand regarding piquing children’s interest but because a board game includes the social physical interaction aspect it has a slight advantage in a classroom setting.

Since games are an interactive medium that emphasizes cause and effect, not only will the player learn how to make something work but they will build up computational thinking of why it works and what makes it work. Games that offer a playful experience motivate children to learn.

### CodeWiz:

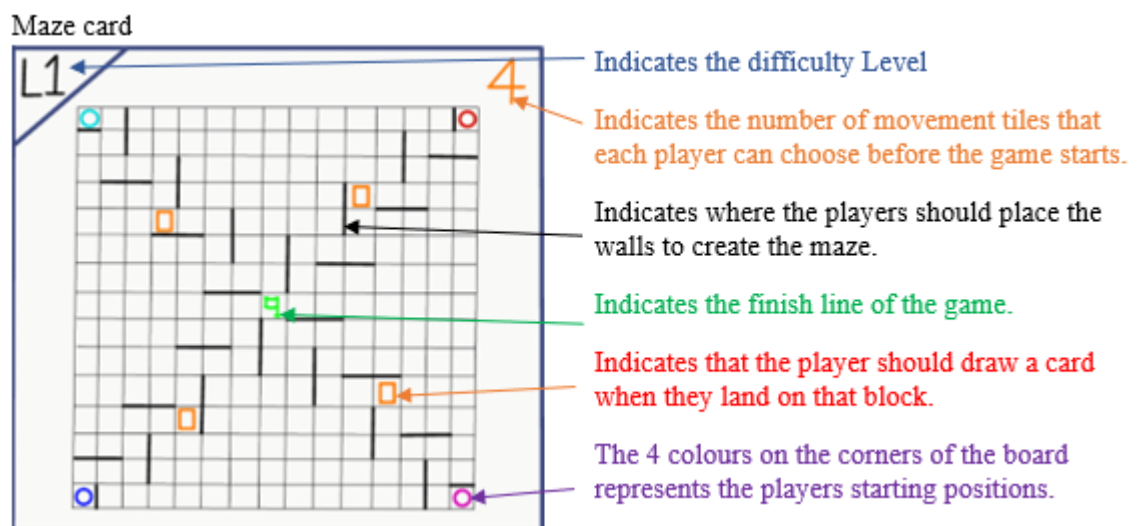
#### General Game rules:

The game is a 1-4 player game.

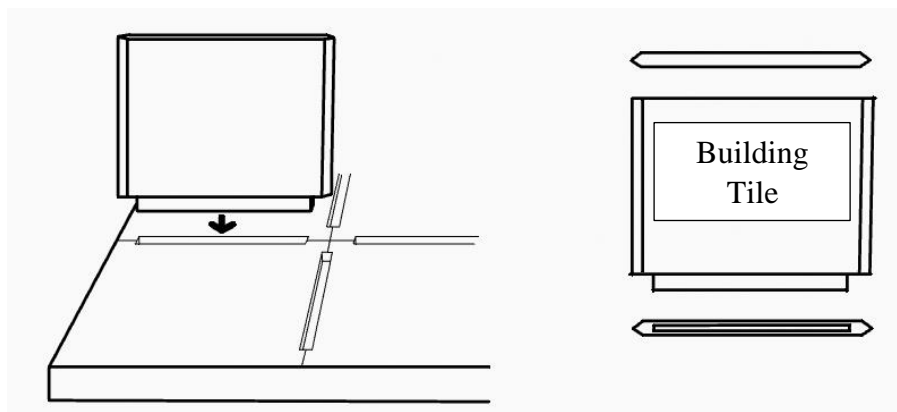
The game rules change depending on the number of players.

#### Rules for a single player:

- The player selects the corner they would like to start from.
- The player then draws a card from a faced down pile of predesigned mazes.



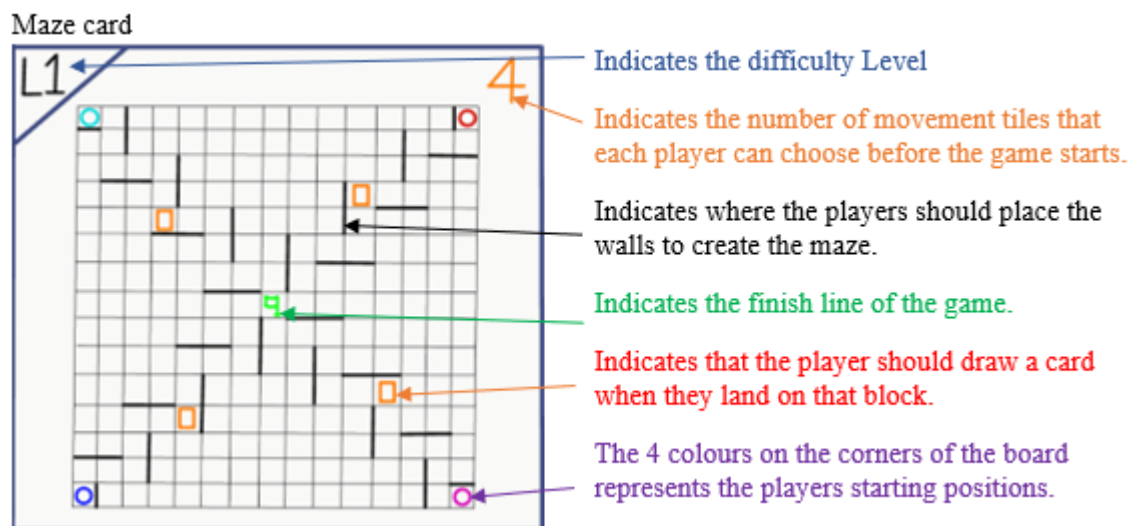
- The player proceeds to build the maze on the board using the indicated building tiles until complete.



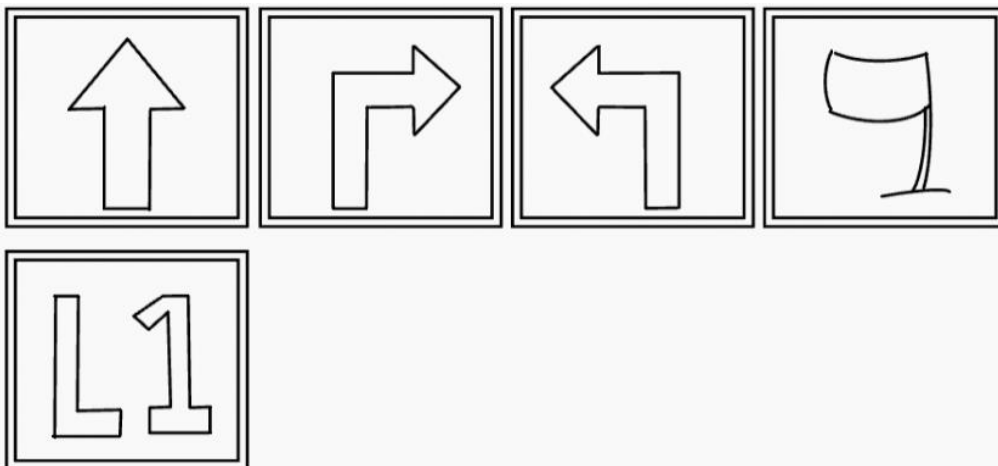
- The player then starts a timer and tries to complete the maze as quick as possible.

Rules for Multiple players:

- Each player selects the corner they would like to start from.
- The players together draw one card and build the maze together.
- The players decide who goes first, and the game resumes clockwise.
- Players are given 2 minutes to select the tiles they would like to start off with. (for each maze the shortest route that requires the least number of tiles is calculated, a number will be on the maze card that indicates the amount of tiles the players may draw before the game begins, the indicated number will be nearly half the amount of tiles needed to complete the game).



- On each turn a player may take a new tile of their choice.



*(Tiles a player may select)*

- If a player falls on a block that requires them to pick up a card, they should draw a card and follow the instructions.

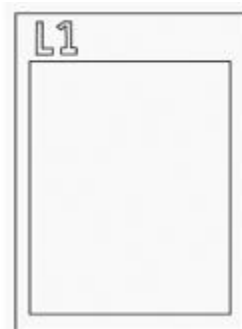
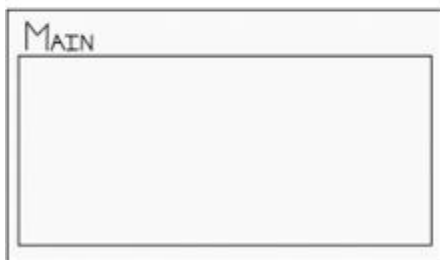


- Gives general information on computer literacy + gives players extra movement tiles.

- The player that gets to the finish line in the centre of the board in the least amount of turns wins the game.

### How a player should play the game.

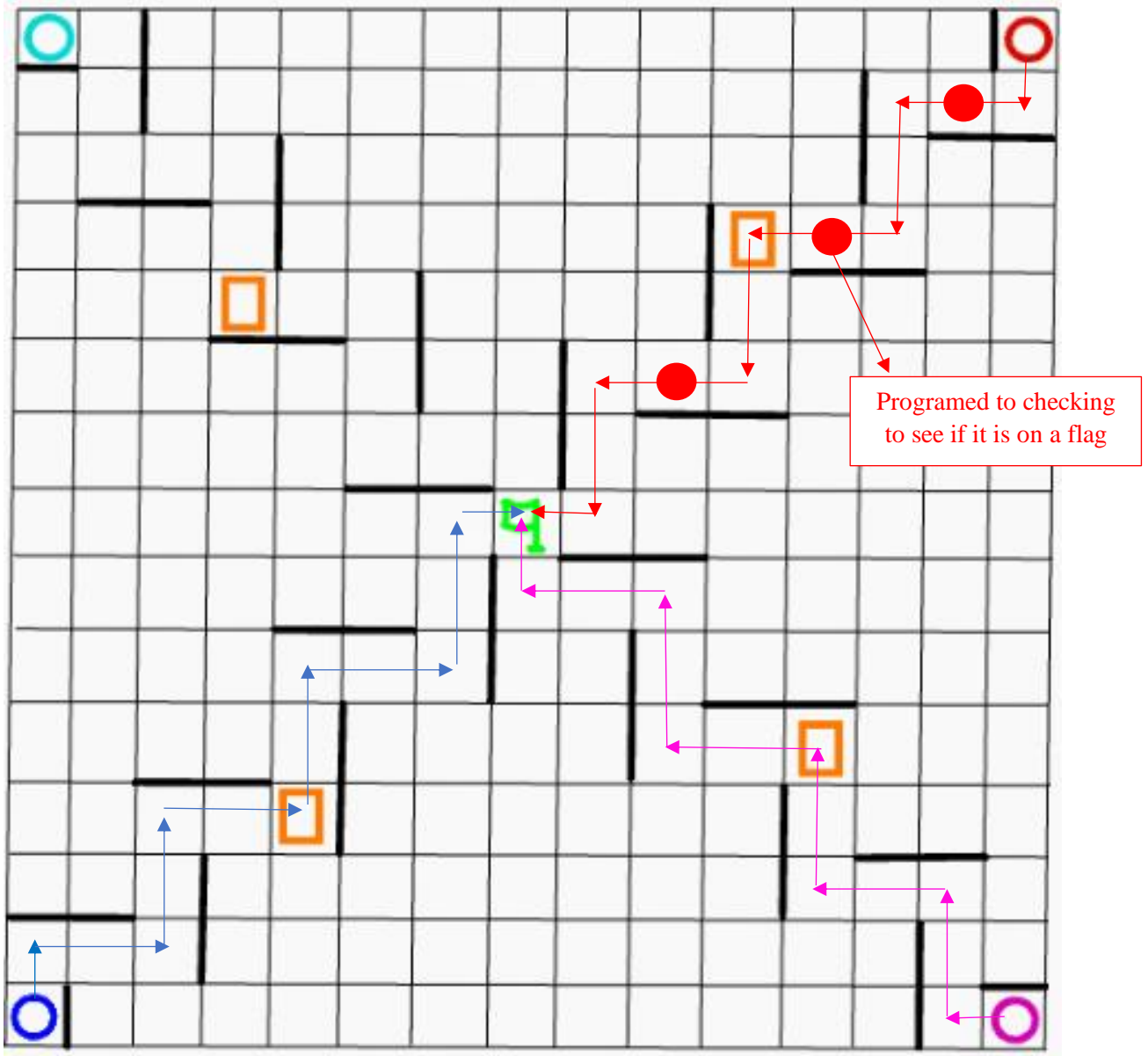
Player boards



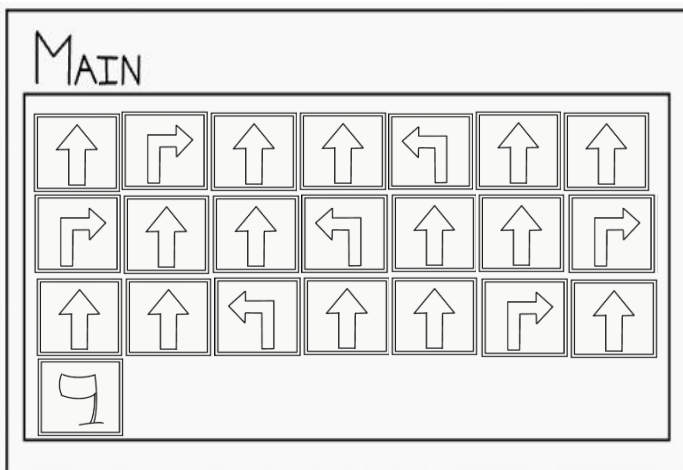
Each player receives 2 boards that will correspond to the colour of their corner, one named Main and the other L1 (loop 1). After a player draws their tiles, they should place it in the order they think will get them from their corner to the finish line.

Example (simulated conceptual gameplay).

This example is to simulate some of the different ways a player can go about completing the maze, all mazes can be completed in different ways. The player has the agency to solve the problem in any way but if the players would like to challenge themselves, they can restrict the number of tiles they can use to the minimum amount of tiles needed to complete the maze. all mazes are symmetrical over the 4 quadrants, the forward direction of the player piece will be indicated by the only opened direction the player can move at the start of the game.



Player 1:

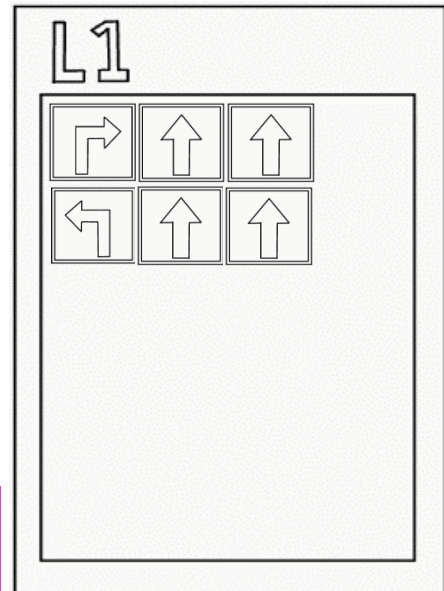
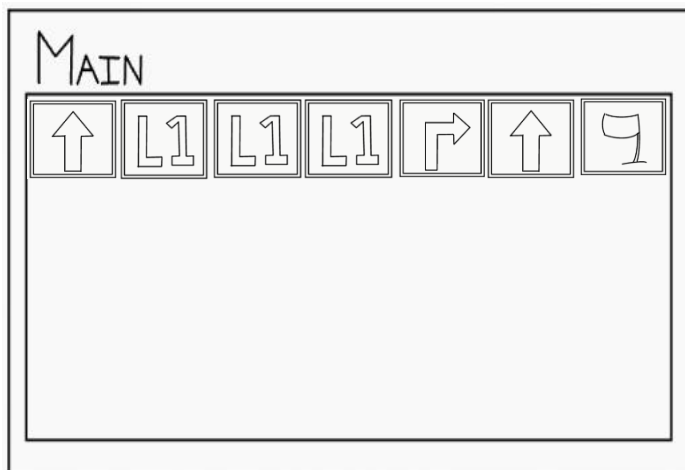


Player 1: (22 tiles used)

This indicates the biggest flaw in not limiting the players to a set number of tiles. Shows that the player has not provided any critical thinking on how they could complete the maze in the least number of turns but has rather just followed the path.

This is not a bad place to start, it still teaches the player that they must be explicit when guiding their piece to the finish line, as in the practice of programming.

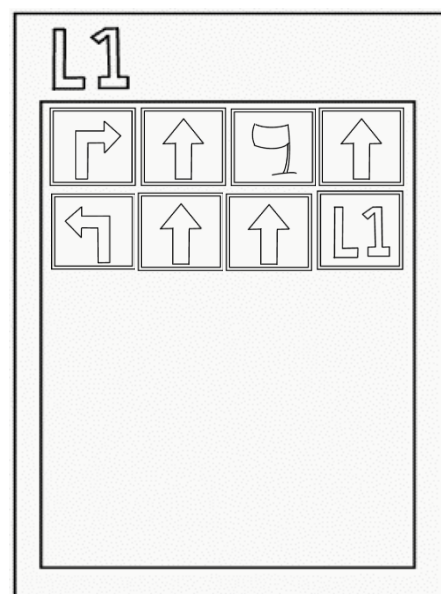
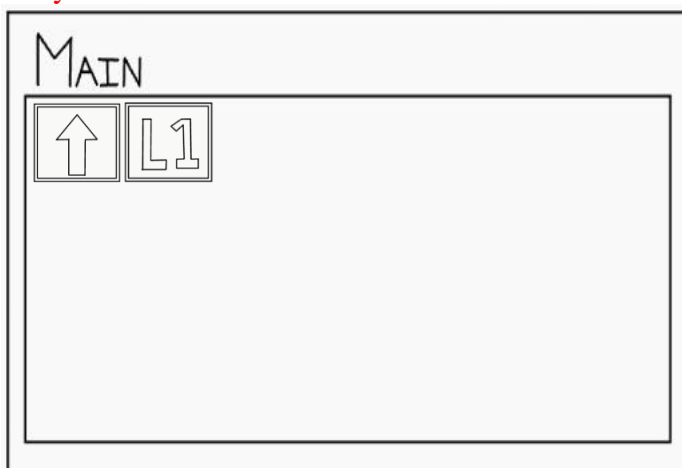
Player 2:



Player 2: (13 tiles used)

This shows evidence of computational thinking, the player learns how to call a function and has isolated repetitive motions that allows them to use less tiles.

Player 3:



Player 3: (10 tiles used)

This indicates a deeper level of understanding and critical engagement. On board L1 the player has created a pattern in which their piece checks if they are on a flag after a set number of moves and P1 loops into itself by calling itself. This allows the player piece to continue until it lands on the flag.

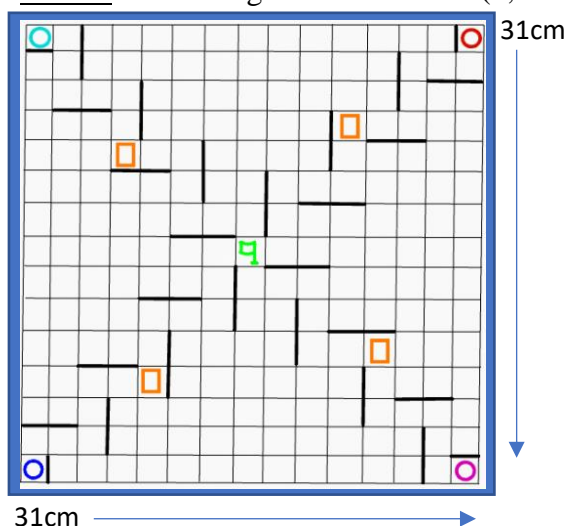
In this scenario player 3 would have won the game by using the least number of tiles which is in direct relation to the number of turns. The more turns the player takes the greater number of tiles the player will have and use, as the player receives 1 tile every turn. Since the player starts off with 4 tiles for this maze, player 3 would have completed the game in 6 turns, while player 2 in 9 turns and player 1 in 18 turns.

CodeWiz's main goal is to supply private, semi-private and public schools. The target demographic for CodeWiz is ages 12-16 with uncertainty on what career defining subjects they should choose. Teaching them the logic of programming may settle any intimidation pupils feel from choosing subjects like information technology(IT). From personal experience IT always had the least number of students. Semi-private to private will be the most prominent consumers for this game as not all public schools offer subjects like IT. In a general sense, schools that do not offer IT may still open a door of interest to pupils that want to do programming or computer orientated work and will be laying the foundation for them. Since CodeWiz is a cost effective, engaging, and easy to learn way of layering the foundation for pupils in pursuit of programming careers it will be one of the most viable products for schools to include in their budget. To market this product CodeWiz will set aside a budget for a website with information about the company and product, that includes contact details and pricing. Other marketing strategies would be personal selling, where a team of marketers will establish a relationship with schools to sell the product. Targeting the department of education will be the main client of interest for CodeWiz for mass production and consumption.

To achieve this CodeWiz needs to be cost effective and use sustainable materials whilst ensuring that the quality is not neglected. The player pieces in CodeWiz is the only component in the game that will not be made out of grey board, grey board is a type of cardboard made from layers of waste paper fibers and is a common material in the production of modern board games making it a sustainable material. The player pieces can be made from wood or recycled plastic since the only purpose of it is to indicate the players position.

CodeWiz component sizes:

Board: 31cm length x 31cm width (0,5cm boarder) x 0,4cm thickness.



4x Main: 9cm length x 15cm width x 0,2 cm thickness.

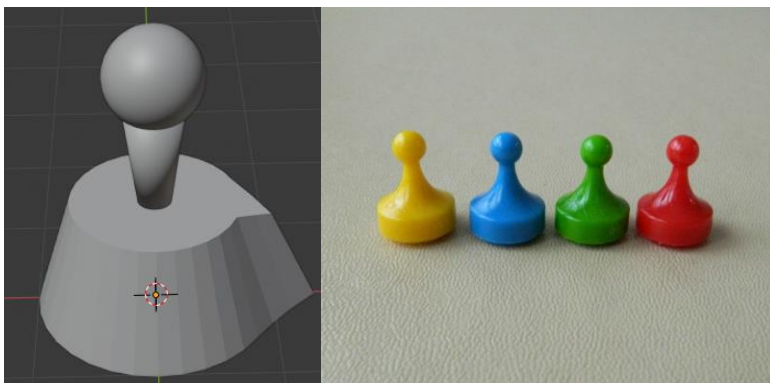
4x L1: 15cm length x 9cm width x 0,2 thickness.

Tiles: 2cm length x 2cm width x 0,2cm thickness.

Pickable cards: 8,8 cm length x 6,2 cm width.

Building tiles: 1,5cm height x 2cm width x 0,2cm thickness.

Player piece: 2,5cm height



Box: 32cm length x 32 cm width x 10cm height.

### Process:

The first step of the manufacturing process for this board game after the design elements and components are mapped out is to start by creating templates for the cutting and punching process. The board, main, L1, tiles and cards are all printed on print paper that is then glued to the grey board, textured paper wrap is then glued to the back side before the final coating goes on to ensure that the components don't wear with use from human pressure or humidity. All the above-mentioned components are cut and assembled by machines, only the final boxing is done on an assembly line of human labour. The player piece is the only game component that is not made from grey board, this component is 3D printed.



Final game aesthetic: CodeWiz is an abstract game.



(Iverson, 2020)

#### References:

Iverson, K., 2020. *Where To Find Board Game Cafés In Bangkok*. [online] Culture Trip. Available at: <<https://theculturetrip.com/asia/thailand/articles/where-to-find-board-game-cafes-in-bangkok/>> [Accessed 11 May 2020].

Pearsonmylabandmastering.com. 2020. *MyLab Programming / Pearson*. [online] Available at: <<https://www.pearsonmylabandmastering.com/northamerica/myprogramminglab/>> [Accessed 11 May 2020].