PES UNIVERSITY

SILVER LINE
Game & Play

Board Game Documentation

Kavya Rai, 01FB16ADE019
Priya Srivastava, 01FB16ADE028

Table of Contents

Design Brief

1. To modify the structure of traditional learning environment through gamification and enhance learning.
2. To spark creativity in students
3. To enable the learned content to leave a deeper impression and also improve traditional methods by making teaching more engaging and fun.

Importance of Gamification

When we participate in activities that stimulate our bodies or minds, such as exercising, our body releases a hormone known as endorphins. The same effect can be achieved by playing e-learning games that challenge learners or give them the chance to achieve a particular reward, even if that reward is something as simple as moving onto the next level. When these endorphins are released, the learners not only have more fun during the e-learning process, but they actually retain more information.

It creates a sense of excitement within the learners because they feel that they are accomplishing something, thanks to the endorphins that are being released. This excitement leads to a boost in motivation and makes the experience more powerful and memorable.

Benefits of gamification in education

1. INCREASES LEARNER ENGAGEMENT

Gamification in learning can help professionals to create experiences that fully engage their learners. Gamification holds their attention and motivate them, given that they are striving to reach a goal. When learners feel positive about their learning process and know that they are going to be rewarded in some way for their efforts, then they stop becoming passive observers and turn into active participants.

2. MAKES E-LEARNING FUN AND INTERACTIVE

While you may have a variety of learning goals and objectives you want to achieve throughout the course, none of these outcomes can be effectively achieved if the learners aren't really excited about what they are learning. Gamification in education makes learning not only informative, but fun and exciting too. It also adds an interactive element to your courses. This creates the feeling of immersion, which offers learners the opportunity to feel as though they are an integral part of the overall learning process.

3. IMPROVES KNOWLEDGE ABSORPTION AND RETENTION

Whether you are teaching first grade maths or eleventh grade biology, the goal is always the same, to instill knowledge within your learners. Even more importantly, learners must be able to access this knowledge when they actually need it in the real world. Gamification in education can improve knowledge absorption and boost knowledge retention by blending endorphins and the awareness of real world benefits.

4. GIVES LEARNERS THE OPPORTUNITY TO SEE REAL WORLD APPLICATIONS

Gamification in education allows learners to see the real world applications and benefits of the subject matter. They are able to get a first-hand look at how their choices within the game result in consequences or rewards. If they do not fare well, then they aren't rewarded for their actions or aren't able to progress to the next level. In essence, these games give them the chance to explore a topic at length and get a firm grasp on how they might be able to apply that information outside of the virtual classroom, while they are in a fun and risk-free environment. Then, when they do venture out into the world, they will have the power to put that knowledge to good use in professional or personal settings.

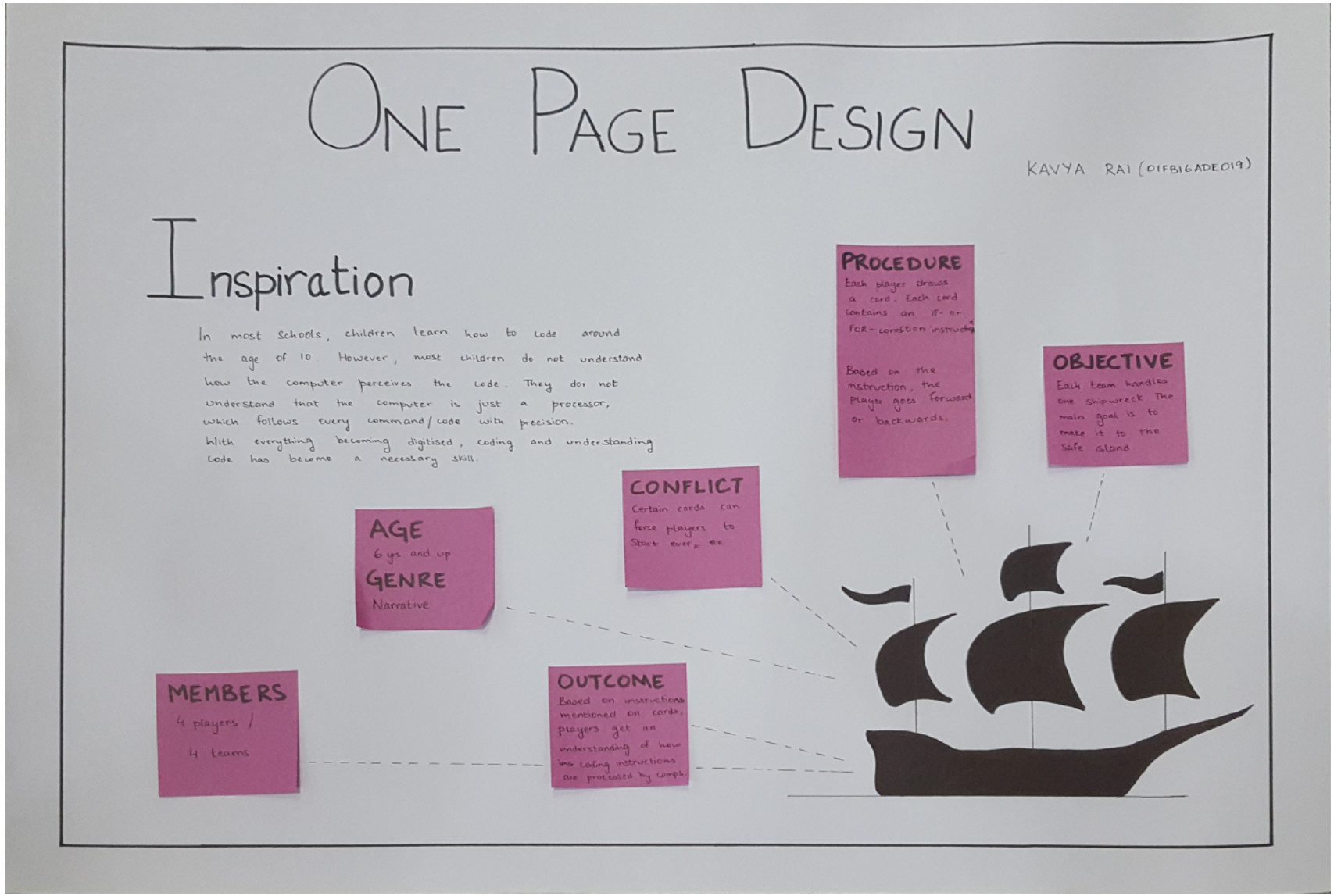
Game Description

"CODE ISLAND" is a fantasy themed adventure board game where children are to play as pirates trying to reach a treasure chest, that is located in the middle of the ocean. Through the game, they will slowly get a basic understanding of how to code. Teaching kids coding at an early age and they will develop a foundation for critical thinking, problem-solving.

Reasons to teach kids coding:

1. Learning programming empowers kids
2. Learning new language
3. Diverse early learning benefits
4. Becomes fluent with technology
5. Digital future
6. Developing critical thinking and problem-solving skills

One page design



Storyline

Four rival pirates have been at sea for the past 18 months, looking for the hidden treasure. En route to looking for the treasure, they are attacked by various things, such as an enemy ship, a sea monster, a whale and an octopus. Despite these difficulties, they do not give up and they make their way to the treasure!

High Concept

1. Aim - To teach children the basic concept of coding, wherein they understand that for a program to function, very specific instructions should be given.
2. Number of players - 2-4
3. Target audience - 6 years and above
4. Genre - educational
5. Estimated play time - 15 to 25 minutes
6. Game price - Rs. 900
7. Competition - Scratch, www.hourofcode.com, Lightbot, Logo Programming

Objective

Each player begins from different corners of the board. The main objective is to program their way through the slots and be the first one to get to the treasure. This includes creating a flow of instructions that are direct and straightforward.

Procedure

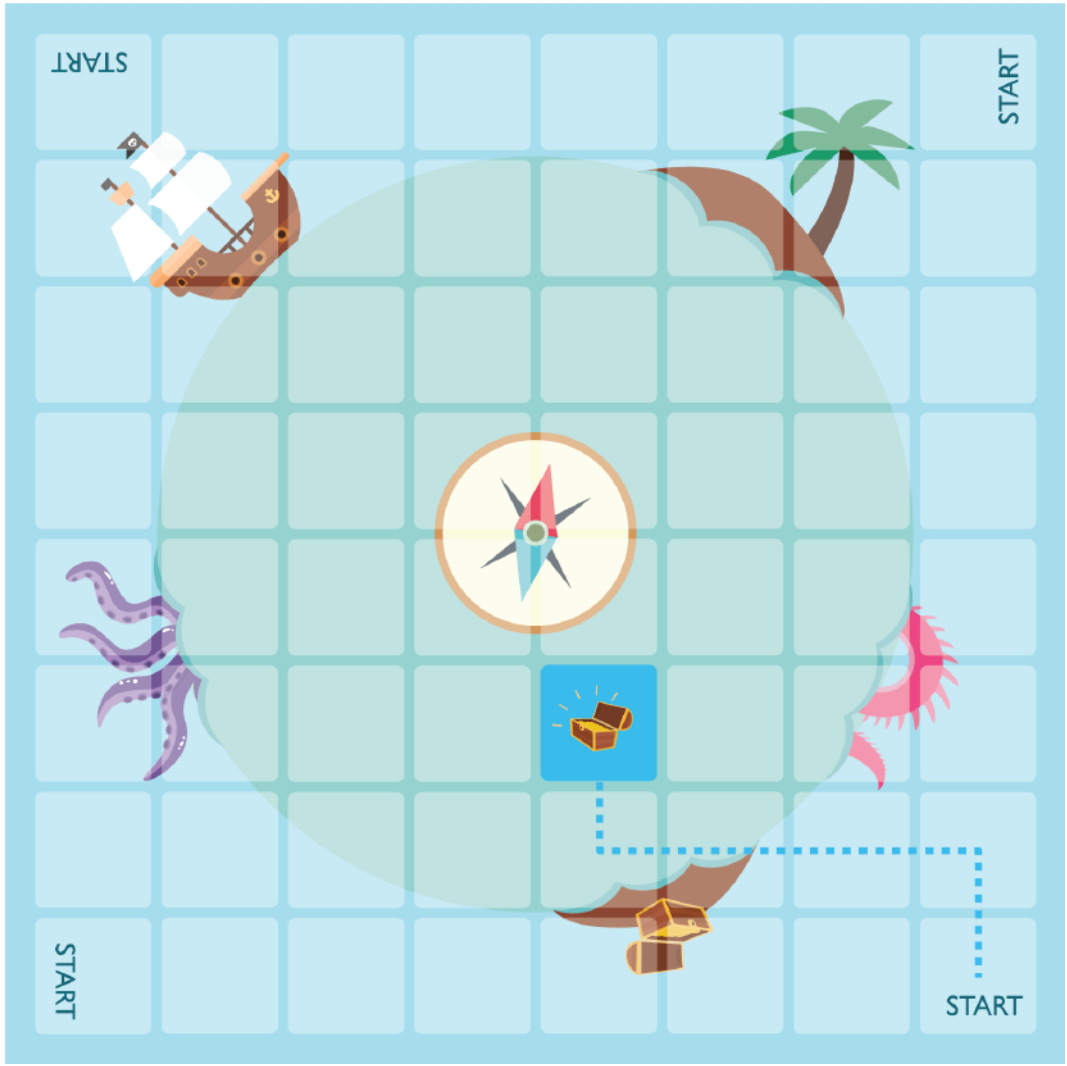
At their turn, the player draws one card from the pile. Based on the card, the players must try and program their way towards the treasure, which is placed on the board at the beginning.

The game is simple to play. Children take the directions cards in turns and plan their strategy to move across the board. Before they move forward the player reveals the card in front and lays it down in his/her program.

Rules

1. Each player selects their pawns and begins at the four corners of the board.
2. The TREASURE card is taken from the set of cards, and placed on one of the slots on the board.
3. The remaining cards are placed in a deck and kept next to the board
4. Going in order, each player draws a card. Based on what is mentioned on the card, the player can decide if they want to
5. When a player draws a DIRECTION card - forward, right, left - they can move their ship one slot forward, to the right or to the left.
6. If they draw an OBSTACLE card - sea monster, octopus, giant lobster - they can place this anywhere on the board. This card could be used to restrict the movement of other players
7. To move past an obstacle card, the player must place the CANNON card on top of the obstacle card
8. If the player draws a CANON card, they can choose to keep it aside and use it at another time

Treasure card



Conflicts

If a player draws an OBSTACLE card, i.e., a sea monster, an octopus or a giant lobster, they can choose to place it anywhere on the board.
This restricts/hinders the movement or progress of the other players.

Obstacle cards

Resources

To move past obstacles (sea monster, octopus, giant lobster), the player must draw a CANNON card, or they can use a CANNON card that they have kept aside. When a player uses a CANNON card, their move is complete.

Resource card

Boundaries

1. A player can move only one slot per turn.
2. When an action card is played, it is counted as a turn.

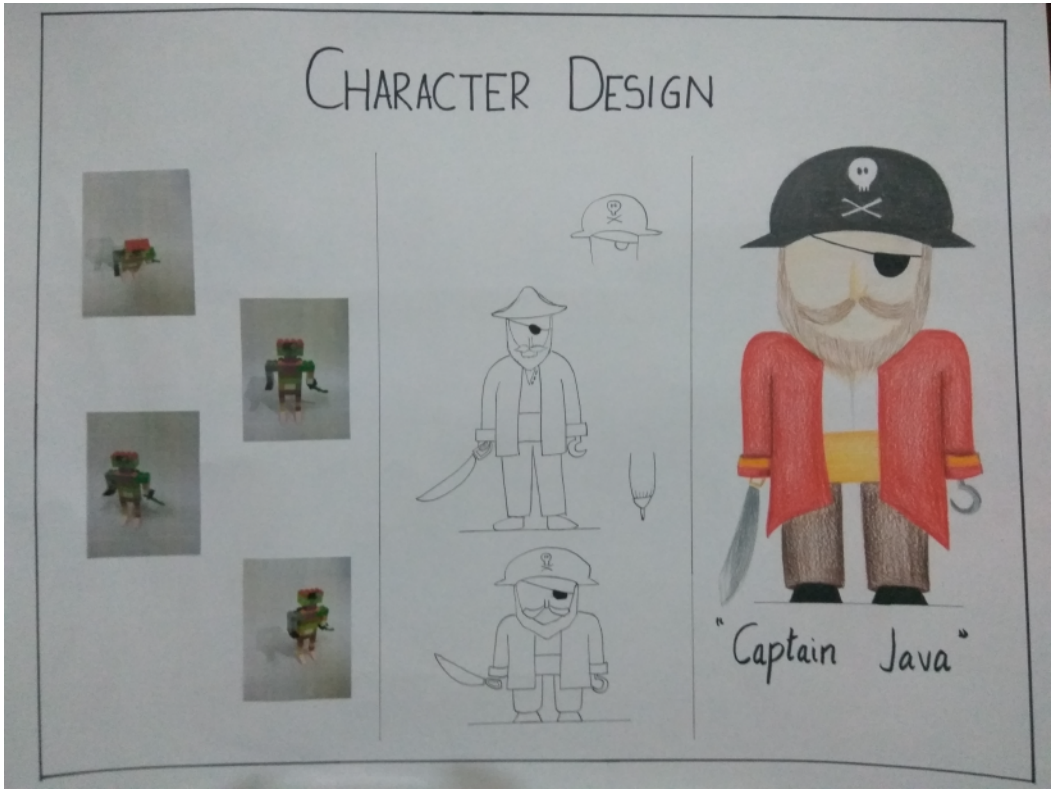
Result

Physically, the first person to get to the treasure chest wins the game. However, from a conceptual point of view, all players are winners. Each player's understanding of the basics of coding improves with the help of the game.

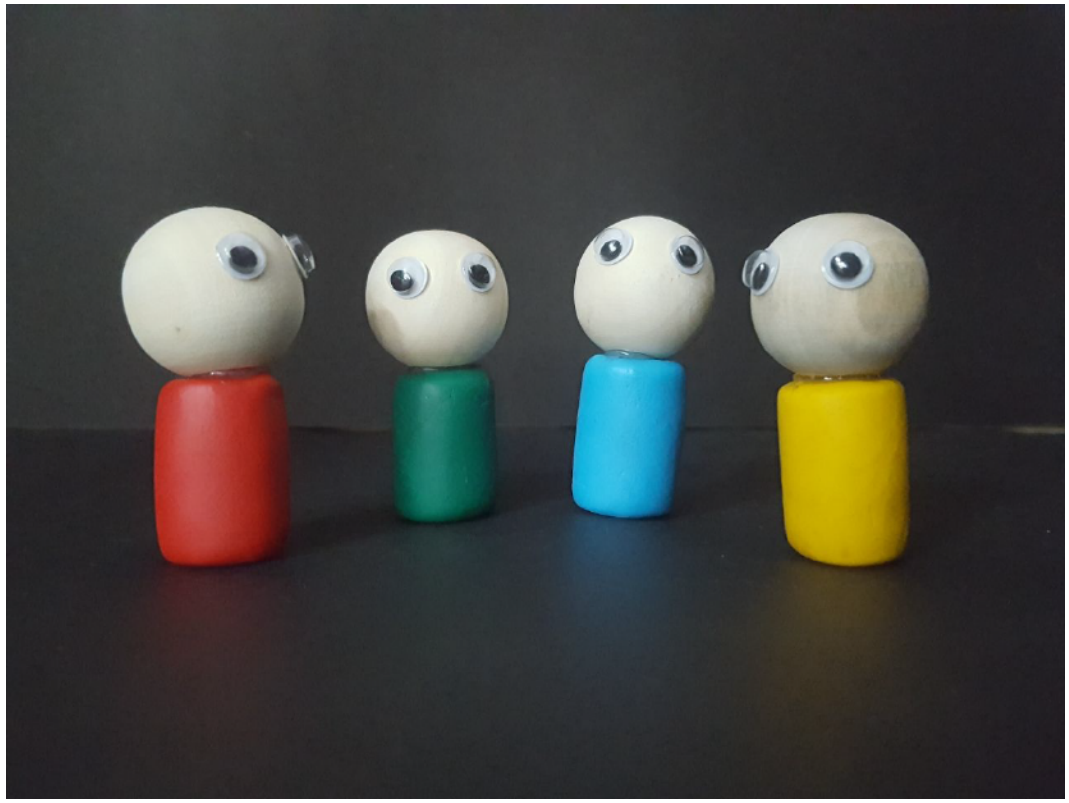
A fun new card game that teaches children the fundamentals of computer coding without using a computer or requiring any specific computer knowledge. Children will be able to develop their understanding of computers as well as building upon the logical foundations required for programming computers so that when they start to learn actual coding, they will already have the required mindset. Once children have learnt the game they will be able to create their own programs – just like real coding.

Characters

Initially our main character was going to be a part of the game.



However as the game mechanics progressed, the need for an active character decreased. Instead, the character evolved into a pawn. This lets players 'represent' themselves as the character. This physical, tactile character offers a more memorable experience to the player.



MDA framework

Mechanics

DICE
To determine the order in which players will draw cards

MOVEMENT
Players can move only one slot forward, to the left or to the right. One move counts as a turn.
Players can also use obstacle and action cards. An obstacle/action card also counts as turn

TURNS
Is based on the number rolled on the die

CARDS
Some of the cards are optional to use, the player can use them when ever they wish

Dynamics

PREDICTION
The players need to predict their opponent's program in order to prevent them from reaching the treasure first, this is done by placing the opponents path with obstacles.

Aesthetics

SENSATION - Providing pleasure to senses
Visual [graphics on the board, dice],tactile[customized dice, Action and Obstacle cards and pawns]

FANTASY - Related to make believe
The game centers around pirates

NARRATIVE - Story, Unfolding of events
Four pirates at sea are on the hunt for the hidden treasure.

CHALLENGE - Problem solving
Figuring out a strategic method by using the dice

FELLOWSHIP - Interaction/coordination with other players
The interactions between the players are in the forms of preventing others from reaching the treasure chest first by hindering their paths with obstacles

DISCOVERY - Exploring possibilities
Luck plays a huge role in this game as the result depends on the direction cards that the players draw.

EXPRESSION - Finding new ways of doing something, self-expression
Every time this game is played the players are forced to find new ways to complete the task, since the game is purely based on the outcome of the dice.

SUBMISSION - Relaxing, passing time
Setting up the game and having fun with friends and family while learning about it. It is not a very time consuming game.

DPE Framework

Design

LEARNING	CONTENT & PEDAGOGY Strategical thinking
STORY TELLING	SETTING & NARRATIVE Setup of board game
GAME PLAY	MECHANICS Rules from the rule book
USER EXPERIENCE	USER INTERFACE The user interacts with all parts of the game

Play

LEARNING	TEACHING Encourages friendly competition
STORY TELLING	STORY TELLING Flow of the Game
GAME PLAY	DYNAMICS Based on luck (based on the cards drawn)
USER EXPERIENCE	INTERACTIVITY Attacking and blocking opponent's path to the treasure

Design

LEARNING	LEARNING Teaches how a step by step process leads to a solution
STORY TELLING	STORY Four pirates at sea are on the hunt for the hidden treasure.
GAME PLAY	AFFECT Feeling Satisfied
USER EXPERIENCE	ENGAGEMENT Strategizing and gaining interest in coding

Outcome

Skills developed:

1. Promotes problem solving by breaking down problems into their components
2. Teaches how a step by step process leads to a solution
3. Helps direction recognition & co-ordination
4. Encourages friendly competition

Art bible

Overall goals

For our game, we decided the overall art style to be 2D and with a fairly minimal cartoon style.
The overall feel is fantasy game like with mostly pastel colors for the cards, and high contrast colors for the symbols and character tokens.
The game board also has a pastel color palette with symbols and no text written.
The font that we are using throughout for the game is ‘Gill Sans MT’

Development

This is a list of all the 2D art development:

1. Character Tokens - Small representations of the chosen character, it is what the player uses to move around the board.

2. Direction Cards - Determine the actual game play of the game, a player draws one every time his turn starts and the card he get will determine how many spaces he moves forward and then what happens to him.

3. Game Board Symbols - Three different kind of symbols - direction, obstacles and action - are present throughout the board, they help set the tone of each of the paths the player can choose. This increases the variety of possible outcomes throughout the game.

4. Action Cards - These cards are influenced by the 'game board symbols'

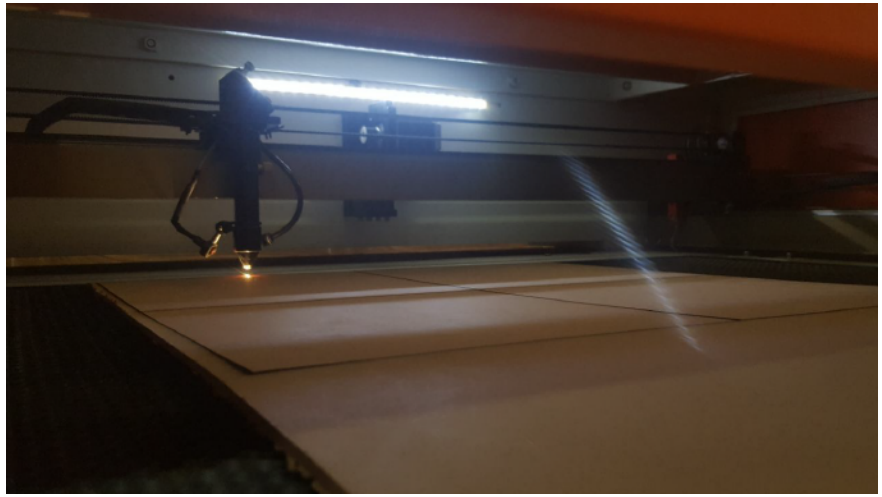
5. Game Board - Environment where the game takes place, represents the game world, as well as the game story and the game progression.

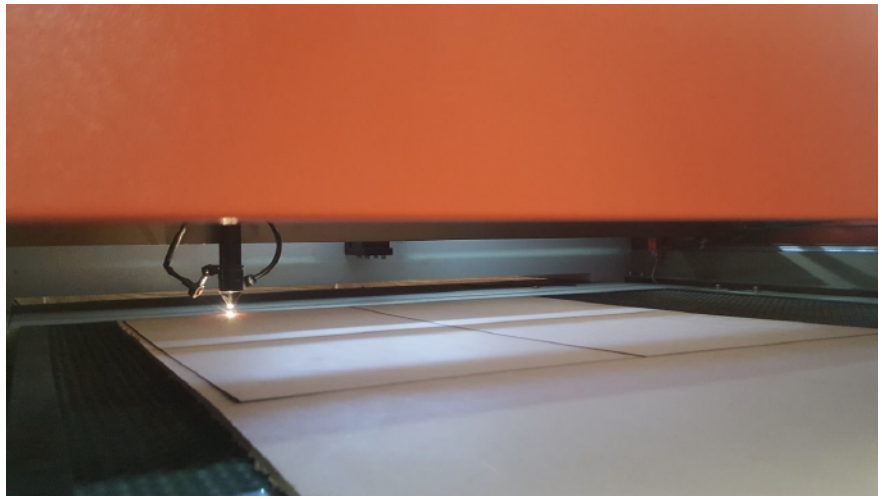
Terrain

In our board we have placed several different symbols on the spaces, and they greatly impact the game play. If the card the play draws has a modifier for the symbols he must check the place where he lands and modify the event according to the symbol, it might change the whole thing for the better or for the worst. We find that this is an effective way to introduce a lot of variety to the game and to the possibilities, without increasing the number of cards, as well as having an intriguing and simpler board with almost nothing written on it, and since the actions are entirely dependant on the cards every game play experience is unique and different, however the symbols permit us to set a tone or a difficulty to a particular path on the board.

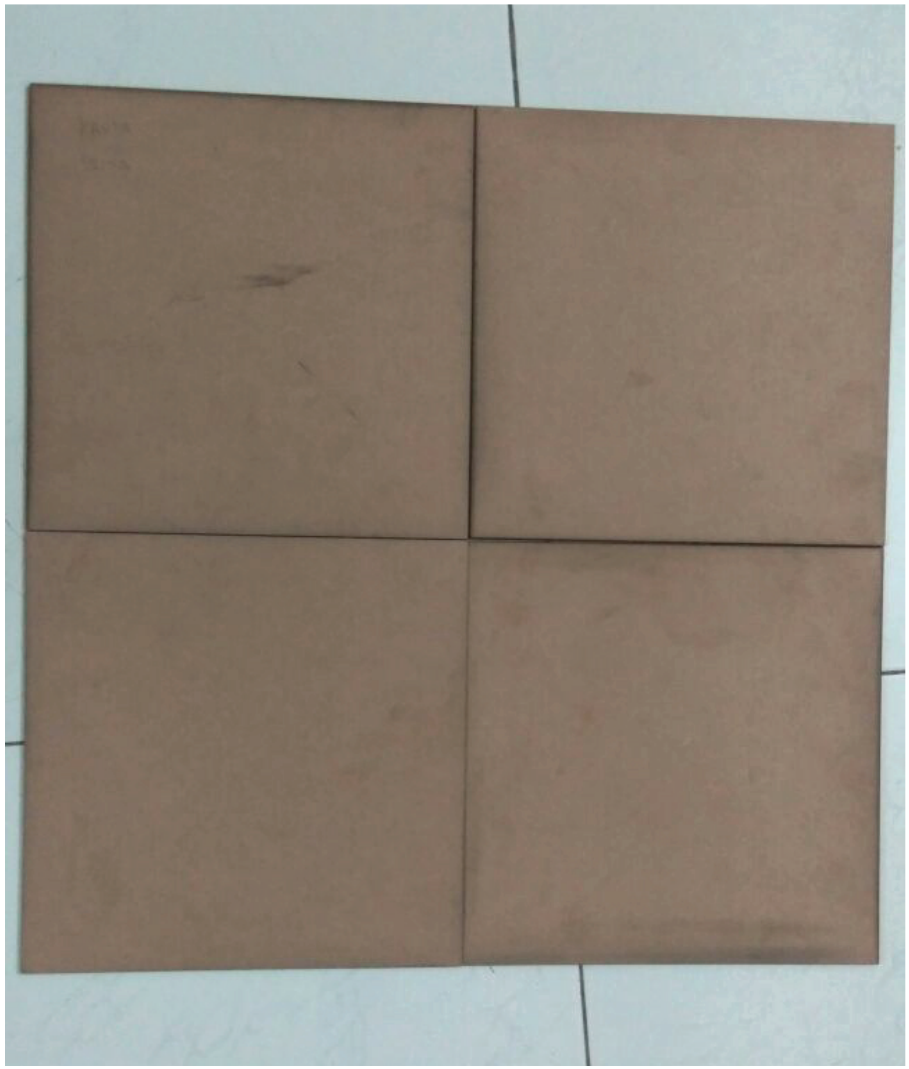
Prototyping

Laser cutting the board pieces

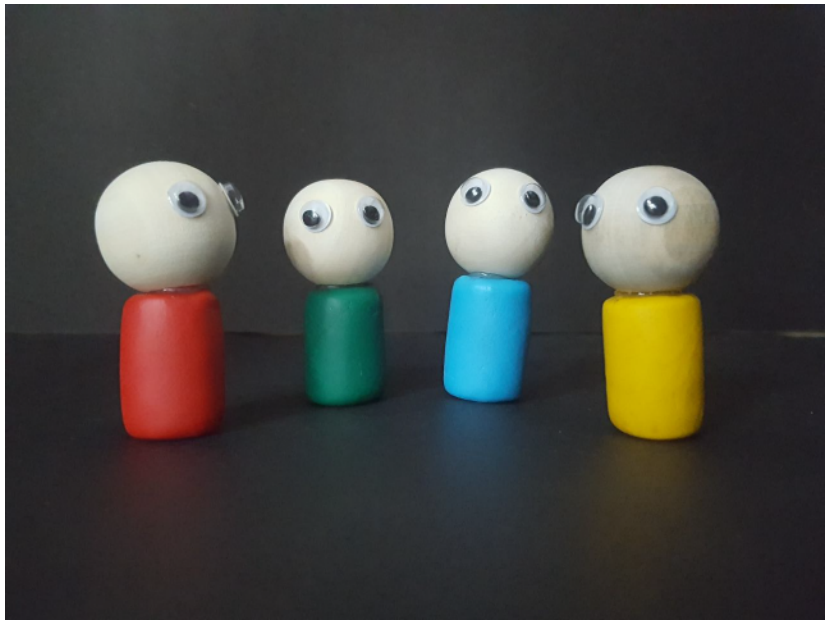




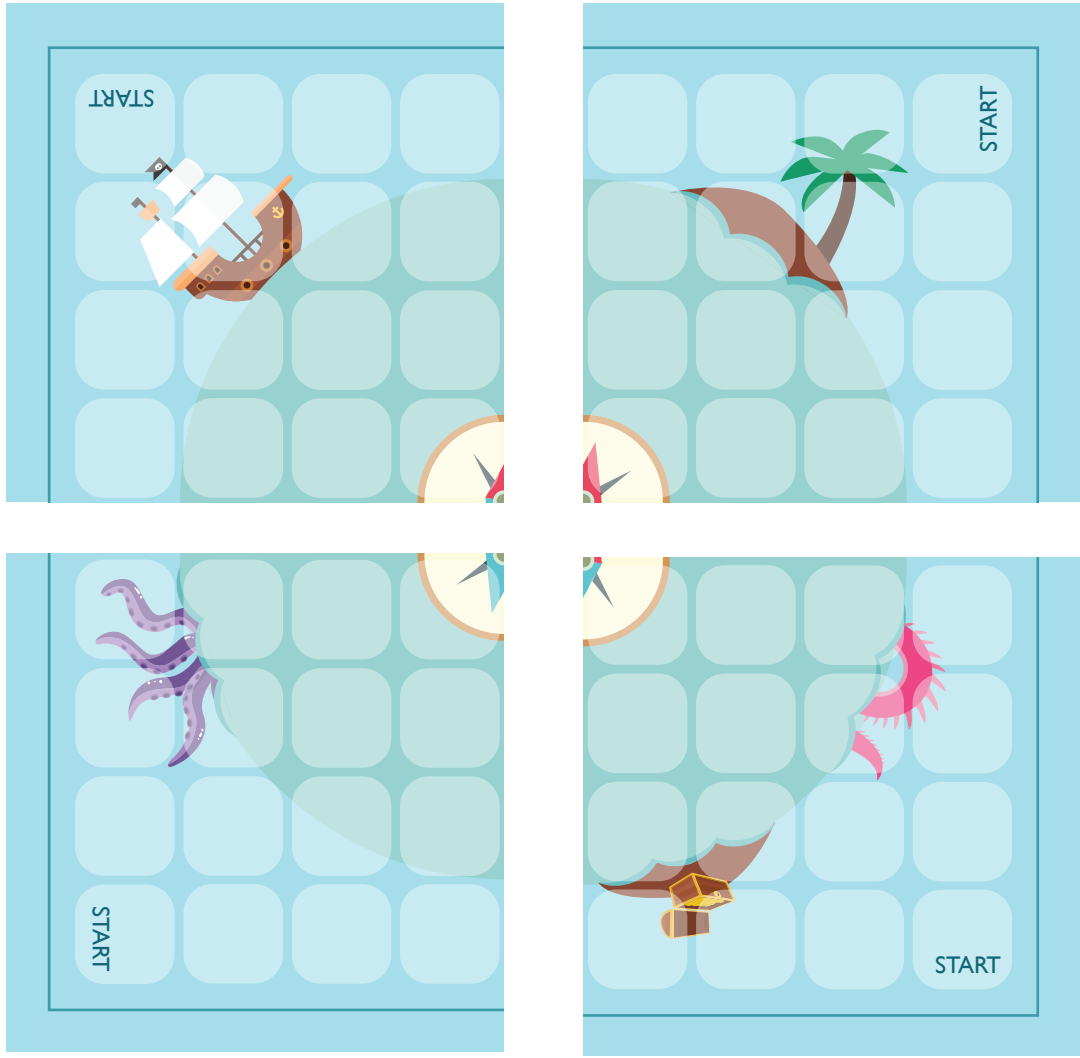
Board pieces



Pawns



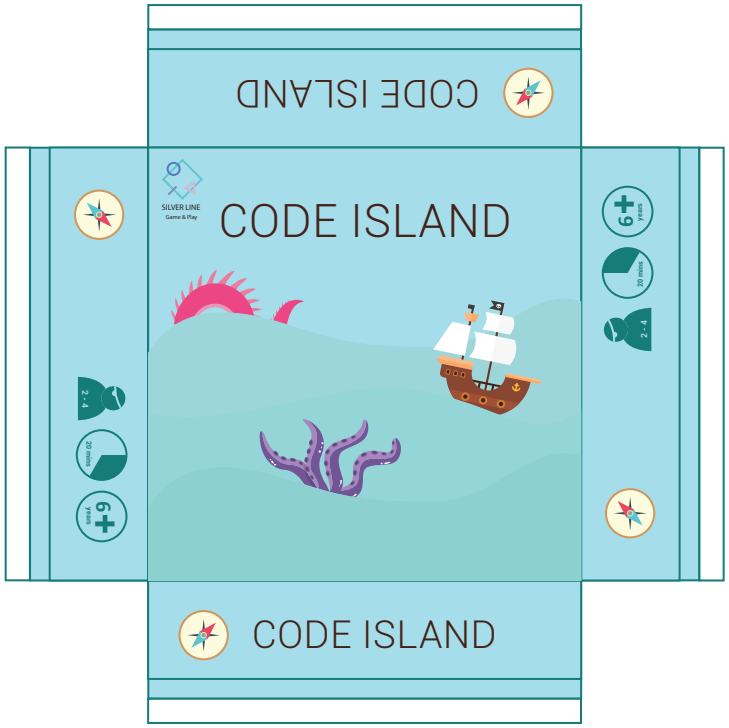
Board Sticker layout



Final board

Packaging

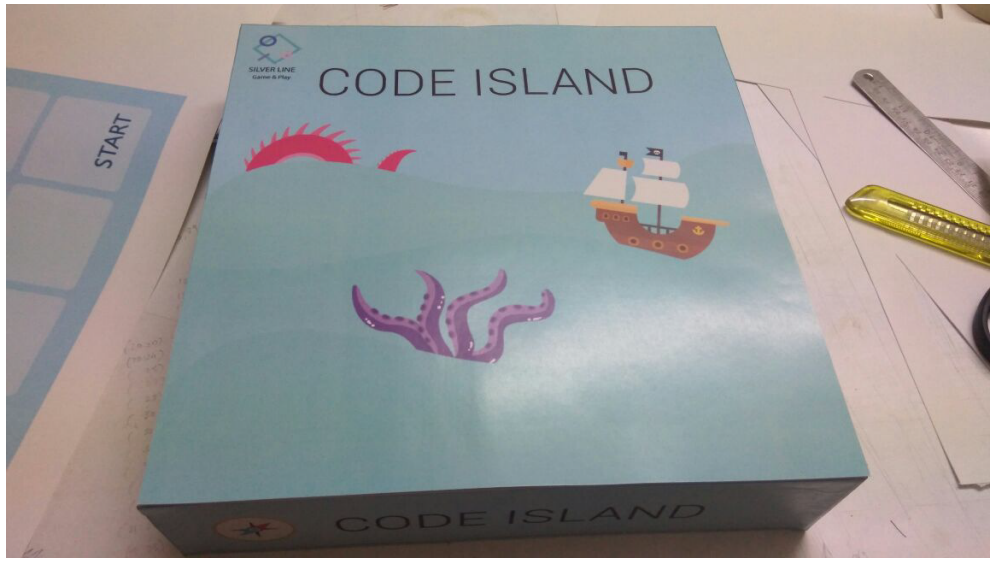
Sticker Layout



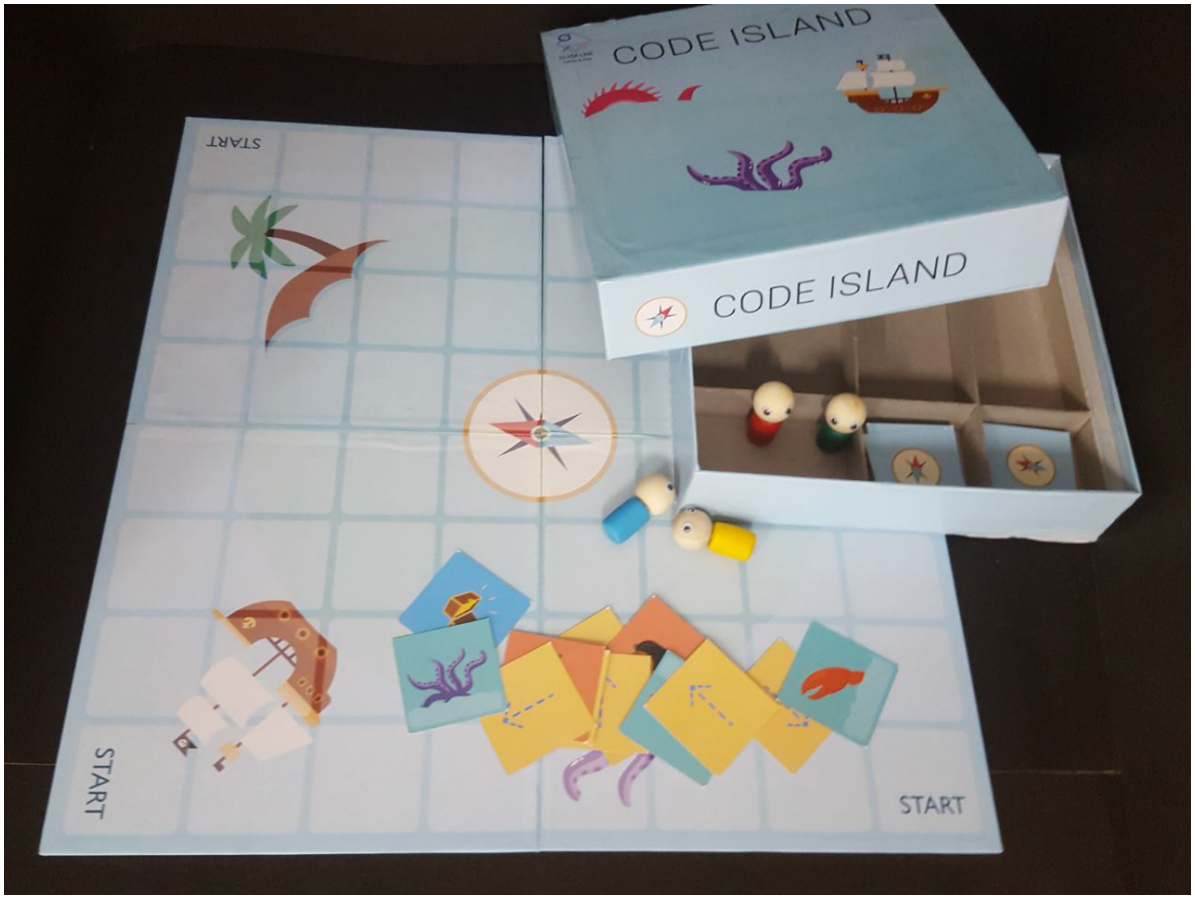
TOP

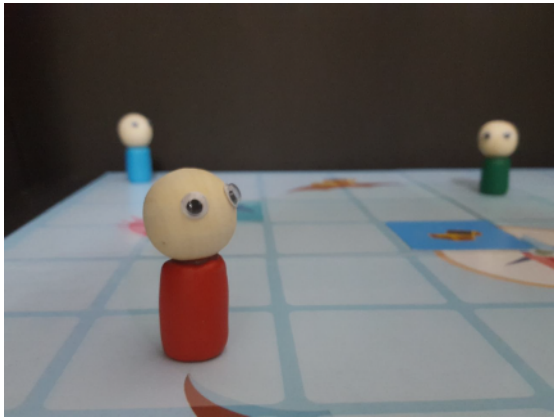
BOTTOM

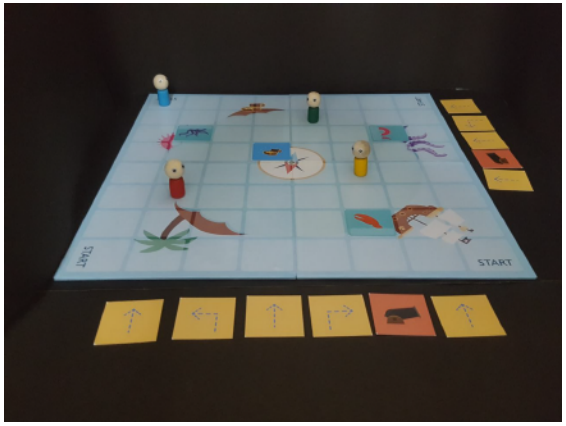
Final Packaging



Final prototype





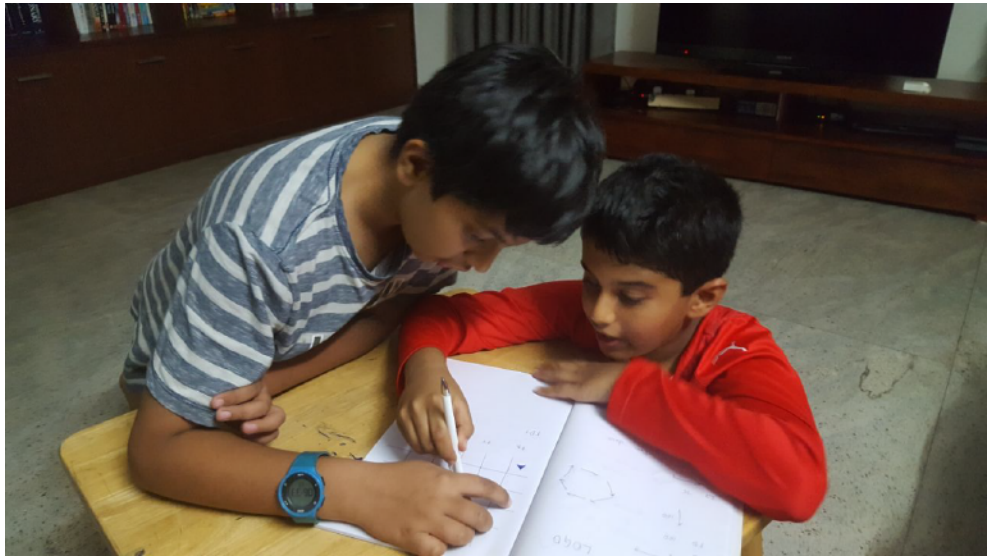


Testing and validation

We tested our board game with children of 6 years and up. The children were divided into three groups - Pool A, Pool B and Pool C - and were taught the basics of coding in three different methods, so as to understand how useful/helpful our board game would be.

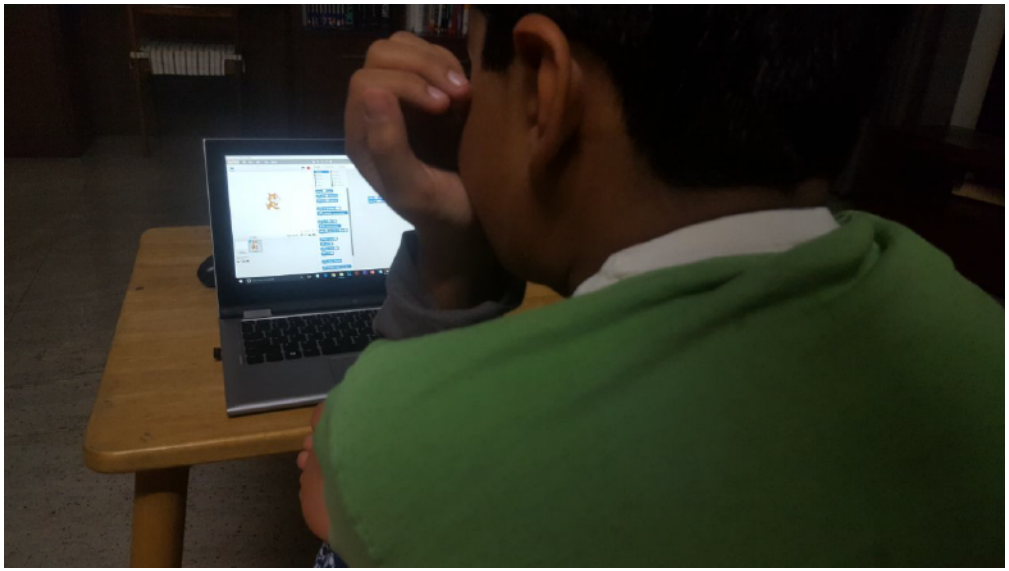
Pool A

This group of children were taught the basics of coding, through traditional teaching methods, i.e., the content taught was mostly theoretical.



Pool B

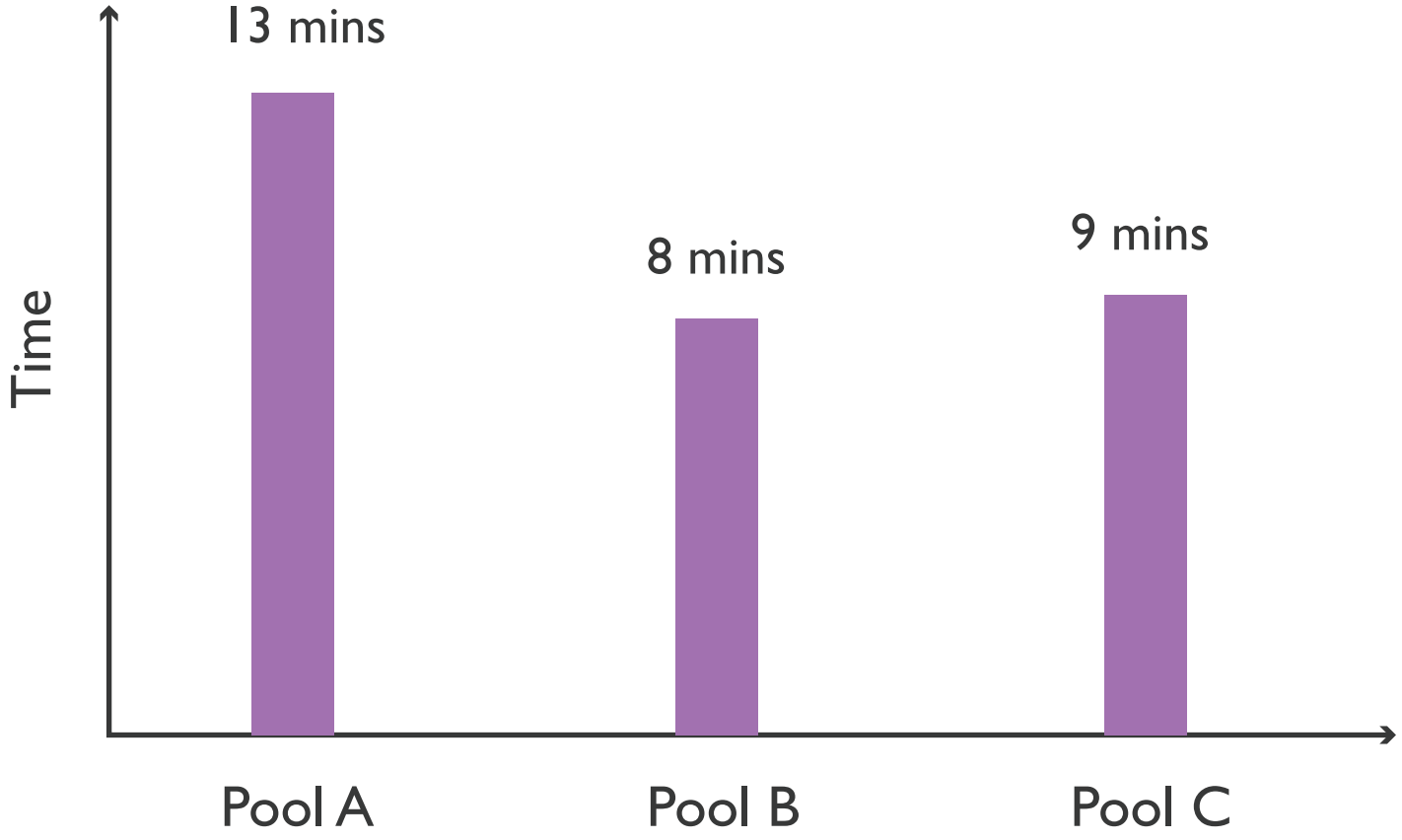
This group of children were taught the basics of coding, with the help of the software ‘Scratch’.
Scratch is a visual coding program, which helps young people think creatively yet systematically.



Pool C

This group of children were taught the basics of coding, with the help of our board game.

Based on the various methods that we used to teach the basics of coding, we gave the children a maze problem to solve. Using restricted functions, they had to navigate their way to from one end of the maze to the other.
With respect to the amout of time taken to complete the maze, we compared the 3 pools that we tested.



During testing, we noticed that children from Pool B and Pool C took approximately the same amount of time, i.e., the time taken to understand our board game is similar to that taken to understand Scratch.
We also noticed that children from Pool A took longer to complete the maze.

This shows that with the help of a game and visuals, the learning process is far better than through traditional learning methods. This is sync with our aim, which is to improve education methods through gamification.

Costing

Prototype cost - Rs. 3500 (approx.)

Test prints - Rs. 200
Packaging print - Rs. 280
Board print - Rs. 640
Card print - Rs. 320
Game manual print - Rs. 200
Chip board - Rs. 300
MDF board - Rs. 600
MDF transportation - Rs. 600
Pawn elements - Rs. 500

Final game cost - Rs. 900

Acknowledgments

1. We would like to thank our Game Design professor, Ganesh S., for giving us the opportunity to work on this project, We are also thankful for his guidance and mentorship throughout the project.
2. We would also like to thank the Faculty of Architecture and Design, PES University
3. We are thankful to Hemavathi ma'am for assisting us with the laser cutting machine.
4. Additionally we would like to thank our fellow classmates, for their constant criticism and feedback, during the brainstorm and ideation.
5. Lastly, we would like to thank Kavan, Nirvaan, Adhi, Aayush, Kannan and Pratham for taking some time apart to test our prototype.