

SCENARIO

Title	ANGLE REFRACTION
Summary	During this exercise, the student will learn to create a character selector, score points, music controller and create enemies.
Author/s	AIJU

DIDACTIC OBJECTIVES

- Teach basics of coding by block
- Learning about local multiplayer and physics of a ball and platforms.

Music Mathematics Information Technology Robotics Programming **X**

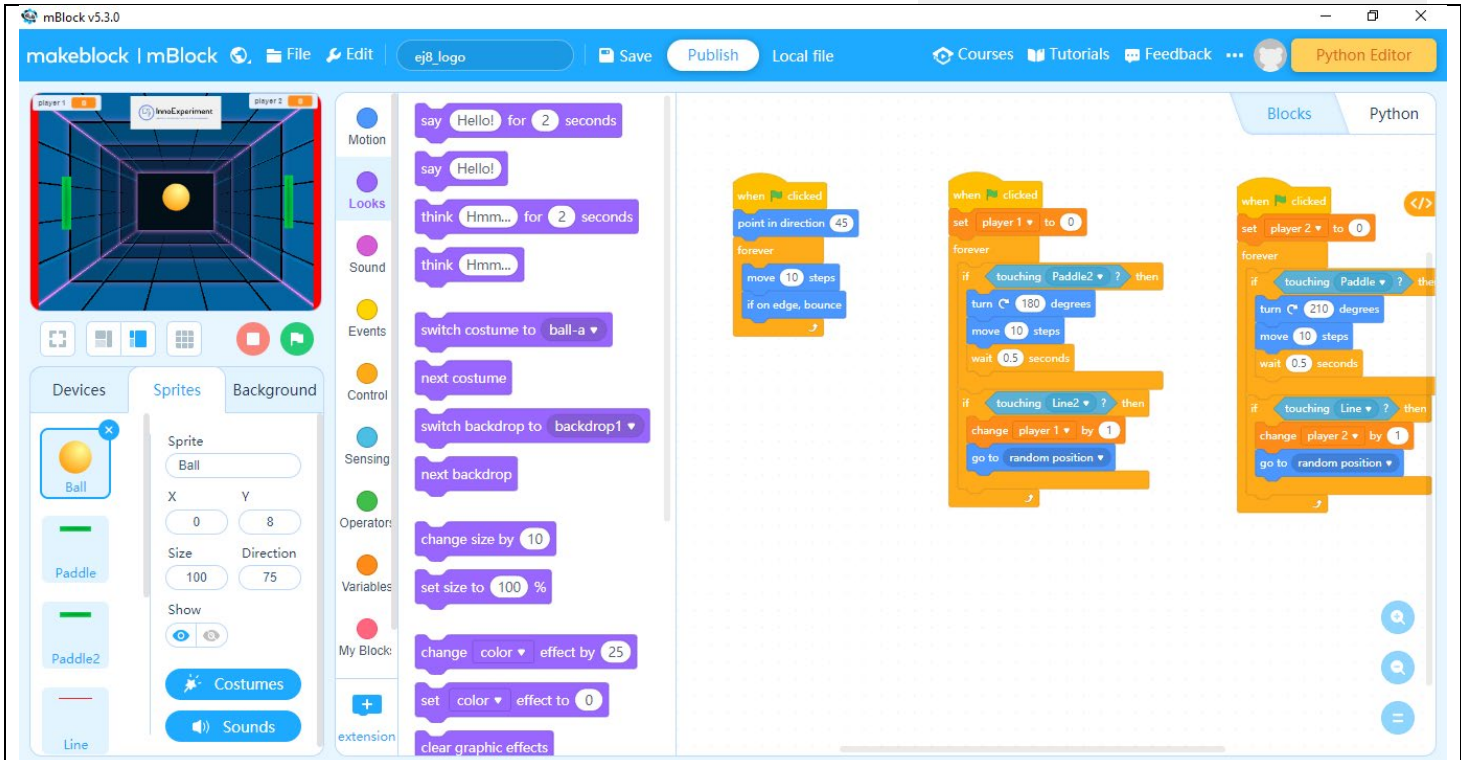
Education Level: 10-12 years 12-14 years **X**

PROBLEM STATEMENT

Begin to teach programming to students through simple block language and image assignment. In a simple way, students begin to understand concepts such as variables, assignments, conditionals.

BOM (Bill Of Materials needed)

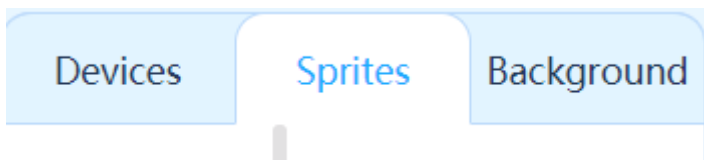
- SCRATCH software
- Assets from SCRATCH software



ACTIVITY DESCRIPTION

The objective of the activity is to develop a Pong type game for two players.

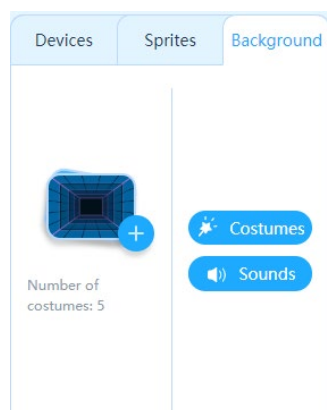
First, we need to create scene, go for Sprites and find assets:



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And background:



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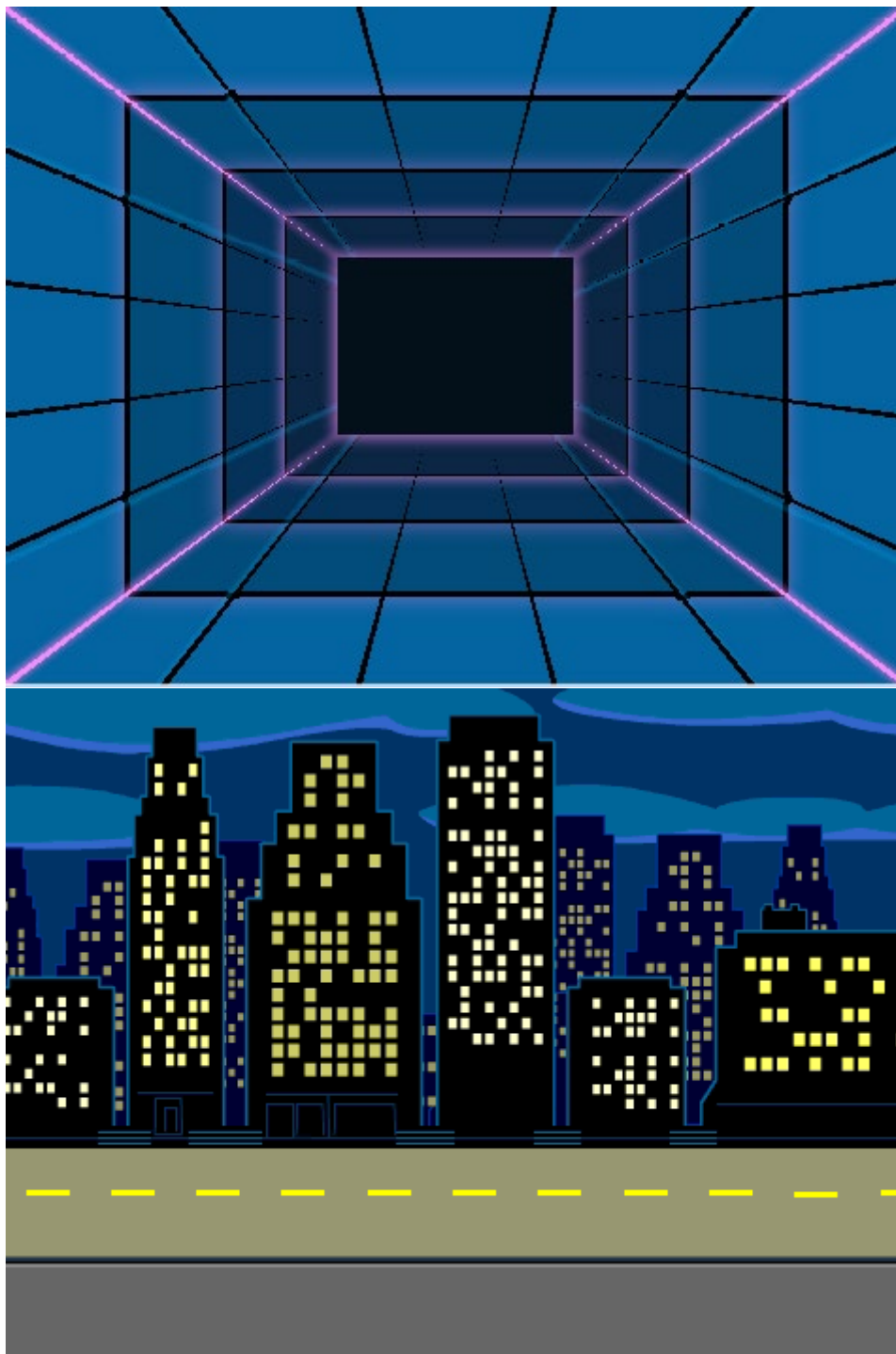


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INNOVATIVE APPROACH TO TEACHING THROUGH EXPERIMENT



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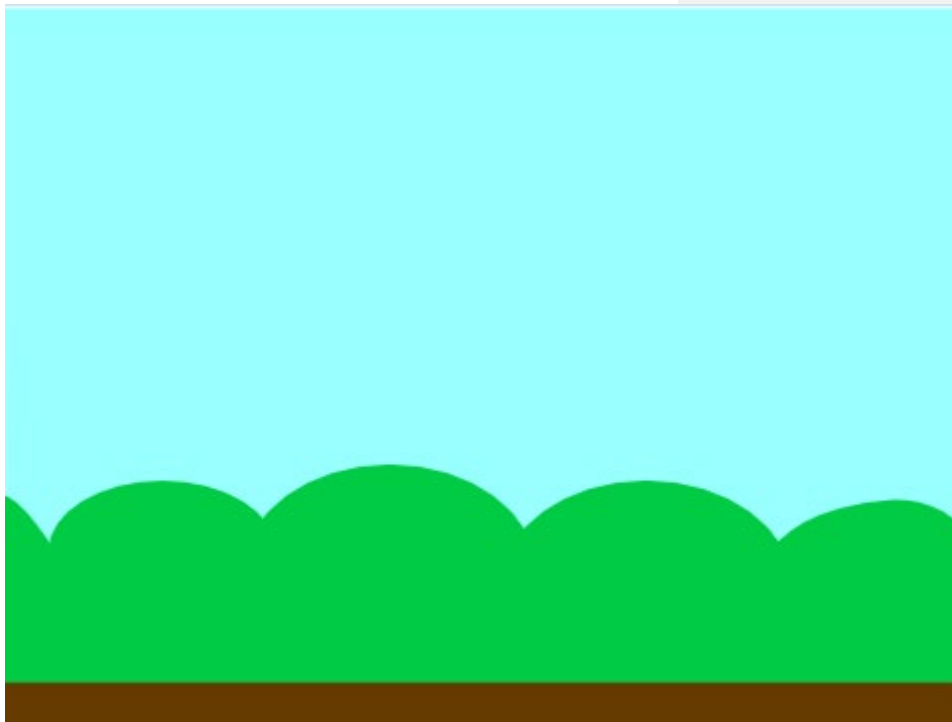


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INNOVATIVE APPROACH TO TEACHING THROUGH EXPERIMENT

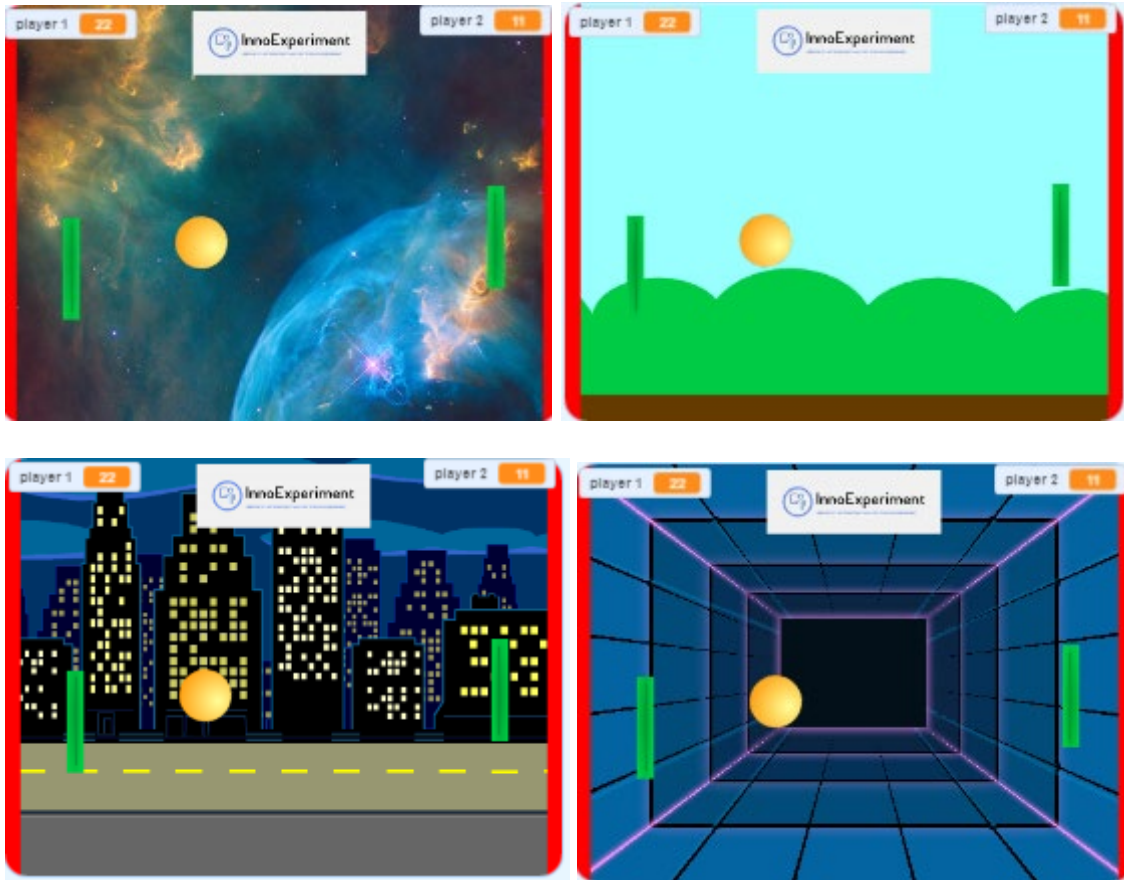


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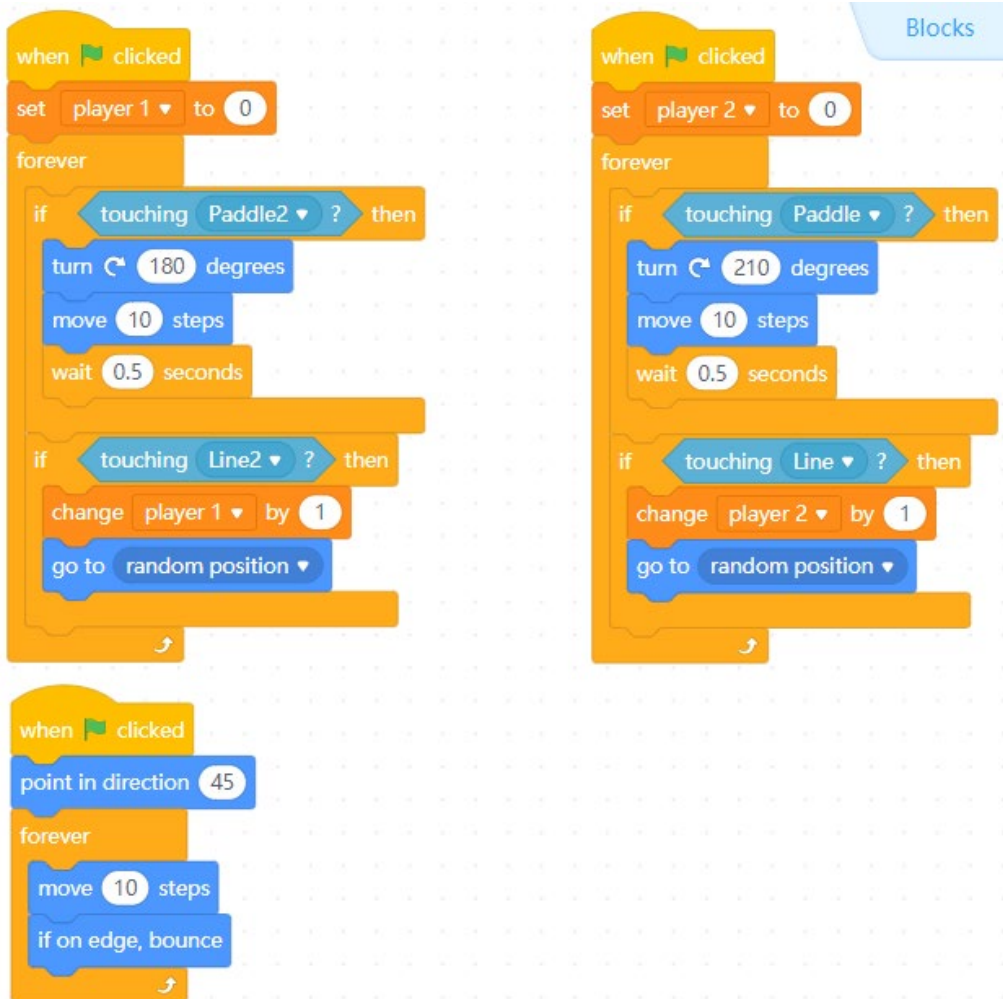
Create visual scene:



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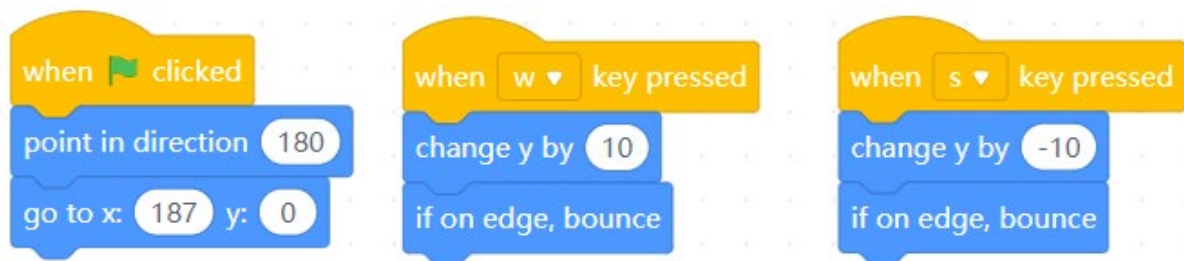
Add coding for each assets:

Ball



The image shows three Scratch code blocks for a ball asset. The first two blocks are for player 1 and player 2 respectively, both starting with 'when clicked' and 'set player X to 0'. They enter a 'forever' loop with two 'if touching' conditions. The first condition is 'touching Paddle2' (or 'Paddle') and the second is 'touching Line2' (or 'Line'). When a paddle is touched, the ball turns 180 (or 210) degrees, moves 10 steps, and waits 0.5 seconds. When a line is touched, the player score is increased by 1 and the ball goes to a random position. The third block is for the ball's movement, starting with 'when clicked', pointing in direction 45, and entering a 'forever' loop where it moves 10 steps and bounces off edges.

Paddle



The image shows three Scratch code blocks for a paddle asset. The first block is for the paddle's initial position, starting with 'when clicked', pointing in direction 180, and going to x: 187, y: 0. The second block is for the 'w' key, starting with 'when w key pressed', changing y by 10, and bouncing off edges. The third block is for the 's' key, starting with 'when s key pressed', changing y by -10, and bouncing off edges.

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Paddle2

```
when clicked
point in direction 180
go to x: -180 y: -2

when up arrow key pressed
change y by 10
if on edge, bounce

when down arrow key pressed
change y by -10
if on edge, bounce
```

Line

```
when clicked
point in direction 180
go to x: -234 y: -37
```

Line2

```
when clicked
point in direction 180
go to x: 234 y: -37
```



STUDENTS' EVALUATION

The way to evaluate the students would be for them to demonstrate on paper how they have developed the exercise and to use the program / game to check the solutions.

SCALABILITY

Regarding the concept of scalability, the complexity could be increased by adding different types of balls: one that goes faster, another that goes slower, etc.

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