

SCENARIO

Title	COUNTING COINS
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 enemies, score, and select character.

Music Mathematics **X** Information Technology **X** Robotics Programming **X**

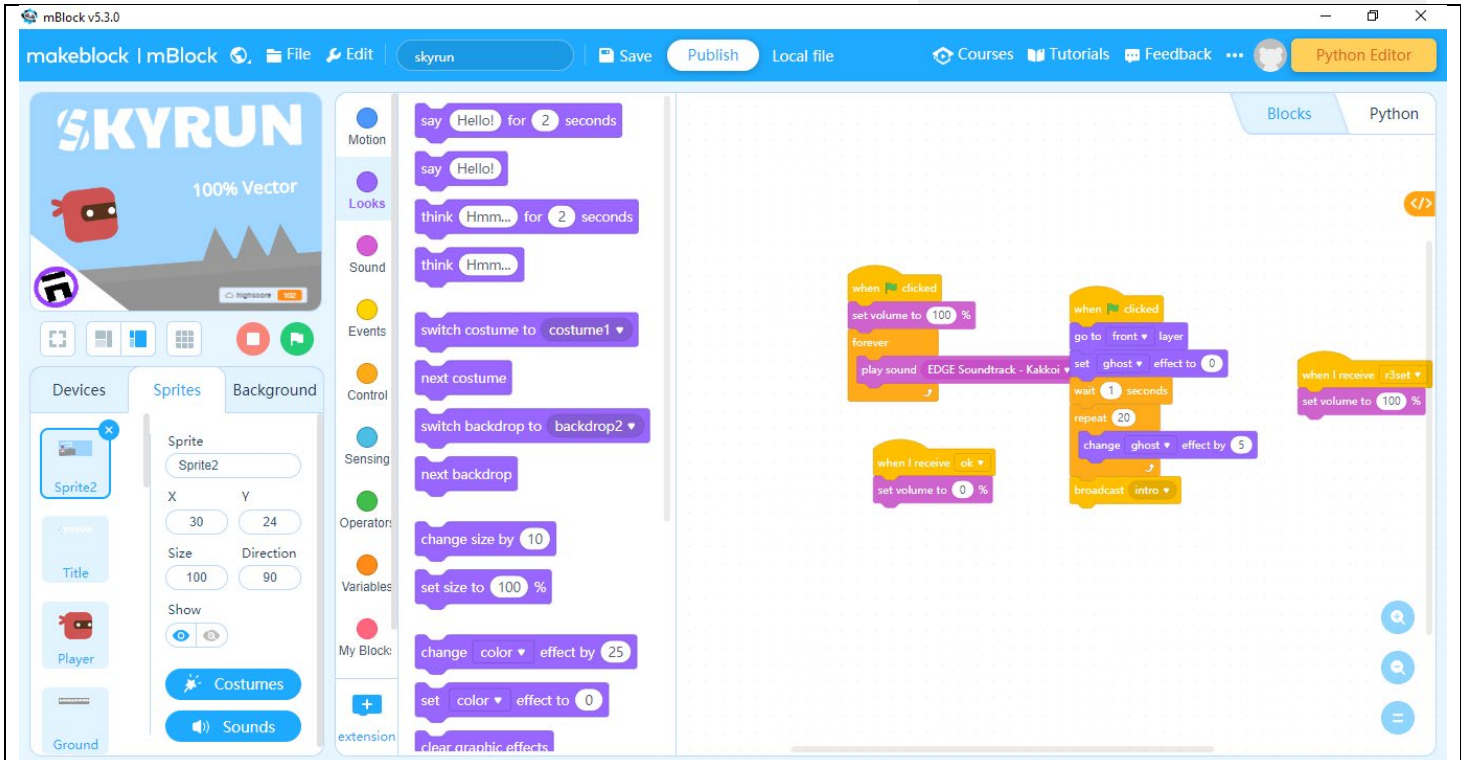
Education Level: 10-12 years 12-14 years **X**

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)

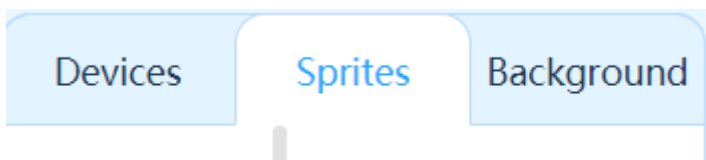
- MBOT software 5.3.0v
- Assets from MBOT software



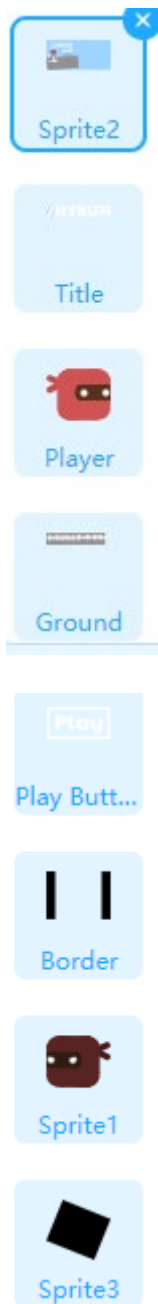
ACTIVITY DESCRIPTION

The objective of the activity is to develop a game in which we will be a ninja and have to avoid obstacles, kill enemies, earn points, music controller, etc.

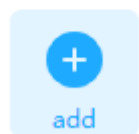
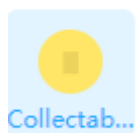
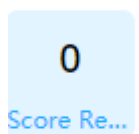
First, we need to create scene, go for Sprites and find assets:



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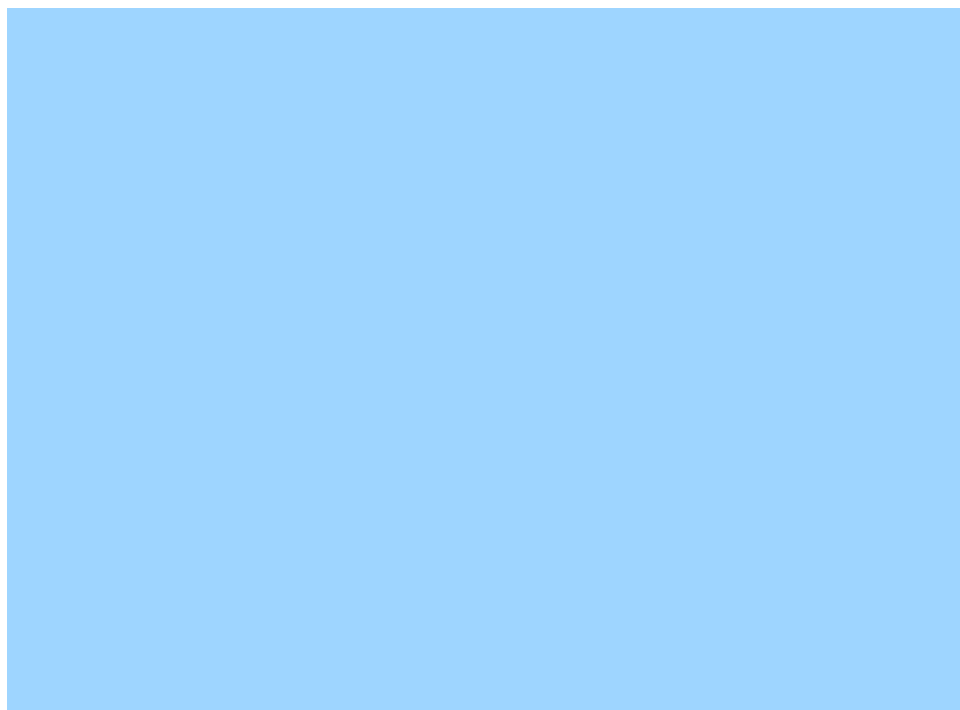
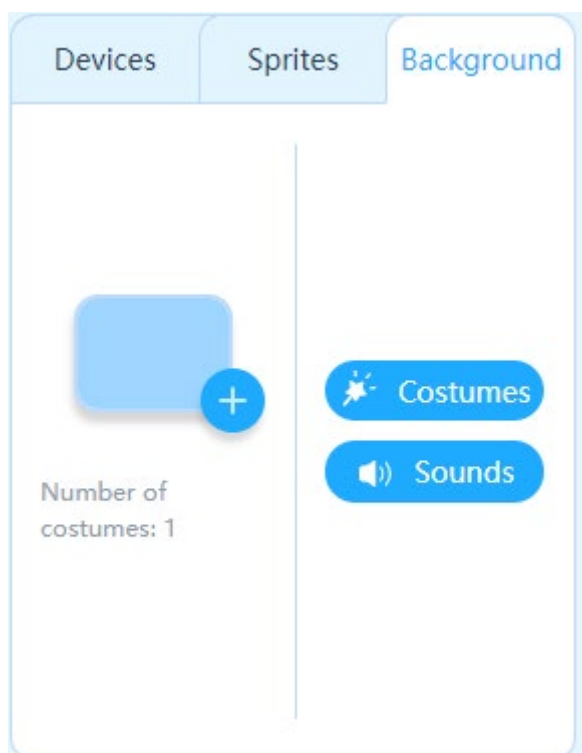


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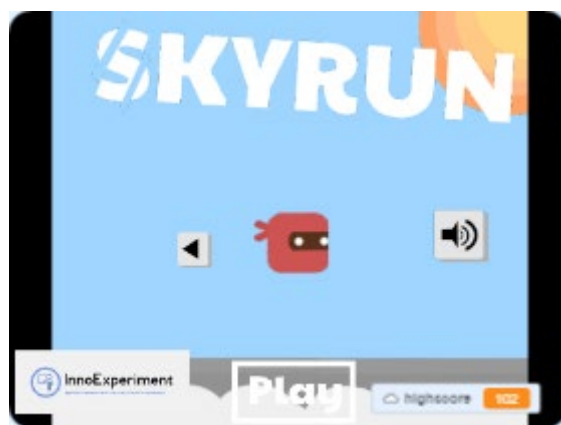
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And background:



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Create visual scene:



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Add coding for each assets:

Sprite2

```

when clicked
  set volume to 100 %
  forever
    play sound EDGE Soundtrack - Kakkoi

when I receive ok
  set volume to 0 %

when clicked
  go to front layer
  set ghost effect to 0
  wait 1 seconds
  repeat 20
    change ghost effect by 5
  broadcast intro

when I receive r3set
  set volume to 100 %
  
```

Title

```

when I receive game over
  set ghost effect to 0
  clear graphic effects
  forever
    point in direction 90 + sin of timer * 330 * 4
    set size to 100 + cos of timer * 285 * 2 %

when clicked
  set ghost effect to 0
  go to x: 25 y: 24
  point in direction 90
  forever
    change cosine by 7
    turn cos of cosine / 5 degrees

when I receive play
  repeat 10
    change ghost effect by 19
  
```

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Player:

```

when clicked
  forever
    if score! > highscore then
      set highscore to score!

when I receive play
  forever
    if touching Sprite4? then
      broadcast shield hide

when I receive switch
  change color effect by 25

when I receive bounce
  set yv to 15

when clicked
  set color effect to 0
  switch costume to costume1
  go to back layer
  go to x: 10 y: -20
  set size to 60%

when I receive play
  set shield? to n
  forever
    set yv to yv * 0.8
    change yv by -2
    change y by yv
    set xv to xv * 0.8
    change x by xv
    if touching Ground? then
      set yv to 2.7

when I receive play
  go to x: 10 y: -20
  set size to 60%
  show
  forever
    if touching Ground? then
      if key up arrow pressed? or key w pressed? then
        repeat 18
          turn 20 degrees
  
```

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```
when I receive play
set score! to 0
forever
  if touching Ground? then
    if key up arrow pressed? then
      start sound Low Whoosh
      set yv to 35
    if key right arrow pressed? then
      change xv by 1
    if key left arrow pressed? then
      change xv by -1
    if key down arrow pressed? then
      switch costume to costume2
    else
      switch costume to costume1

when I receive game over
switch costume to costume1
point in direction 90
start sound Zoop
stop other scripts in sprite
go to x: 10 y: -20
set size to 60%
forever
  if score! > highscore then
    set highscore to score!
```

Ground

```
define shift
  go to back layer
  set size to 100%
  change x by -5
  if x position < -500 then
    go to x: 900 y: -75

when I start as a clone
  go to x: 900 y: -75
  go to back layer
  set size to 100%
  forever
    shift

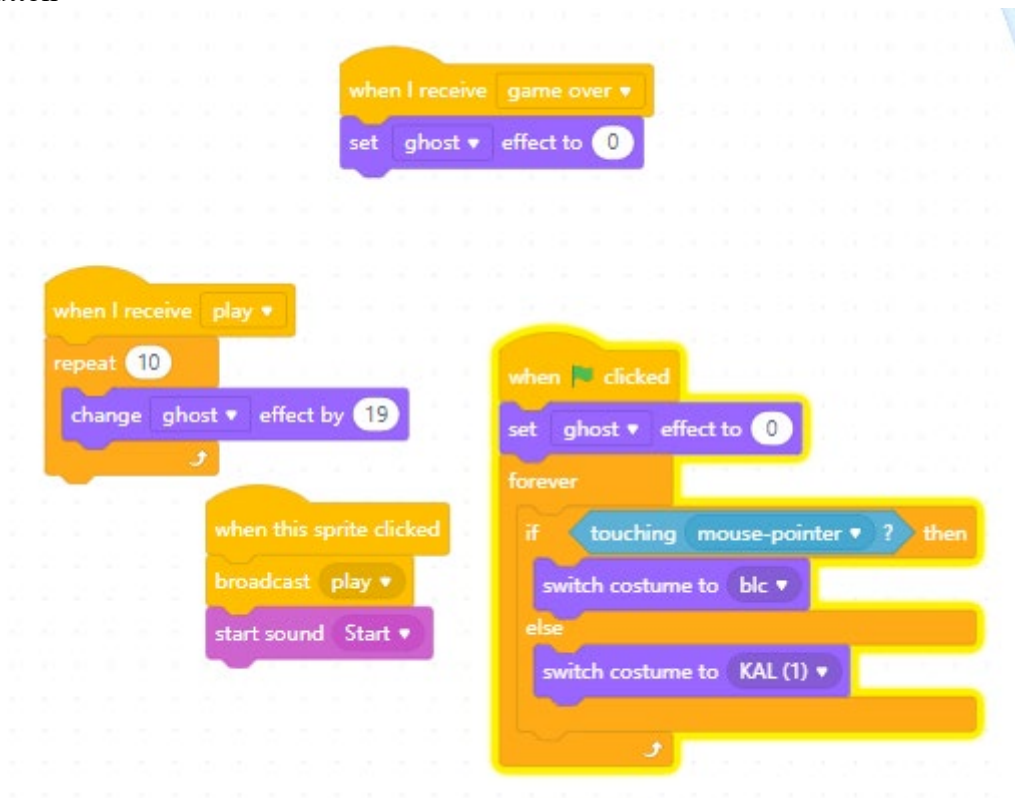
when clicked
  go to x: 0 y: -75
  go to back layer
  create clone of myself
  forever
    shift
```

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Play button

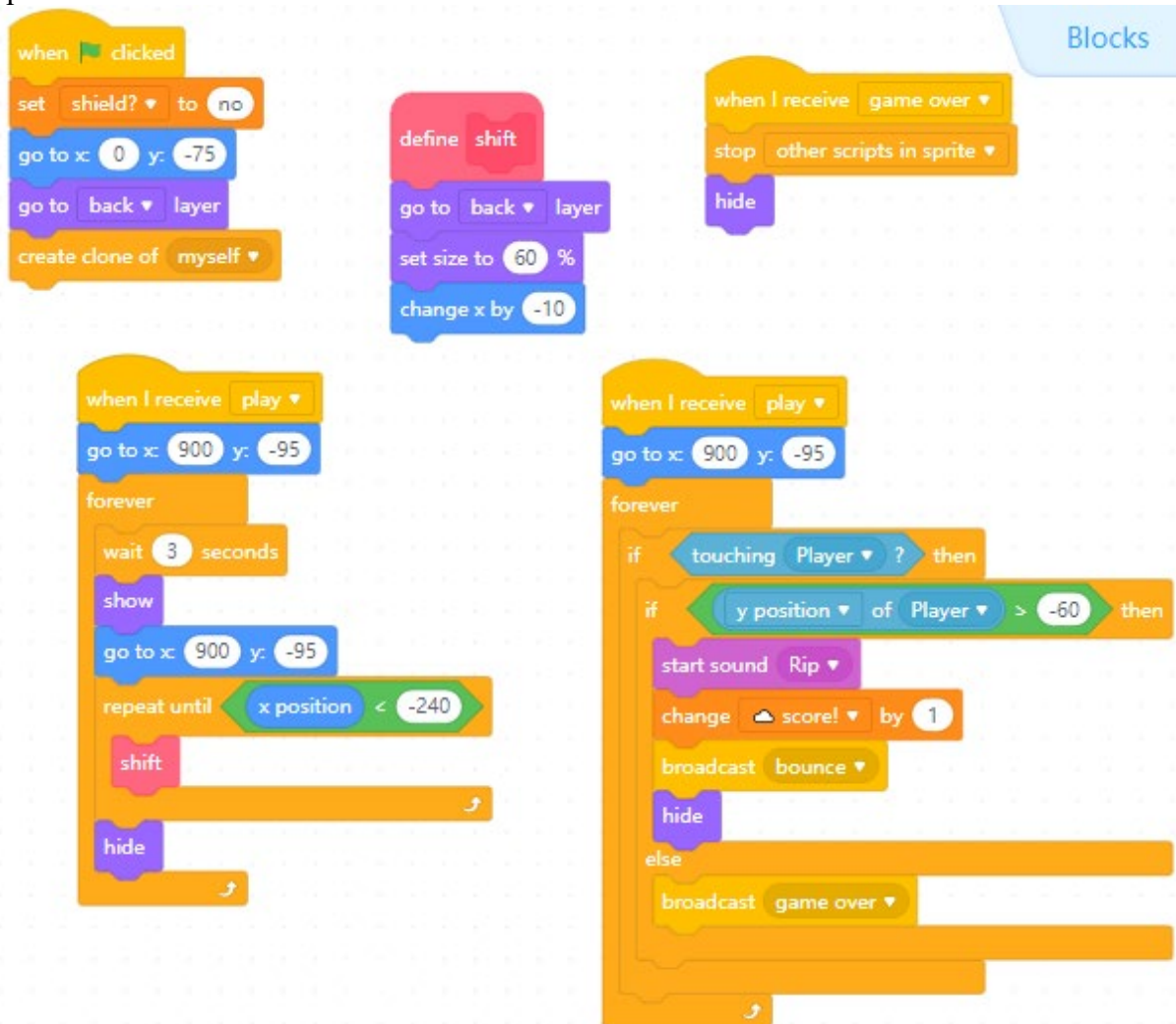


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Sprite1

Blocks



The image displays several Scratch code blocks for a sprite named 'Sprite1'. The blocks are arranged on a grid background. A blue 'Blocks' label is in the top right. The code includes: 1. A 'when clicked' event block followed by 'set shield? to no', 'go to x: 0 y: -75', 'go to back layer', and 'create clone of myself'. 2. A 'define shift' block containing 'go to back layer', 'set size to 60%', and 'change x by -10'. 3. A 'when I receive game over' event block followed by 'stop other scripts in sprite' and 'hide'. 4. A 'when I receive play' event block followed by 'go to x: 900 y: -95', a 'forever' loop with 'wait 3 seconds', 'show', 'go to x: 900 y: -95', 'repeat until x position < -240', 'shift', and 'hide'. 5. Another 'when I receive play' event block followed by 'go to x: 900 y: -95', a 'forever' loop with an 'if touching Player?' condition. Inside the 'if' block, there is an 'if y position of Player > -60' condition leading to 'start sound Rip', 'change score! by 1', 'broadcast bounce', and 'hide'. The 'else' branch leads to 'broadcast game over'.

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Sprite3

```

when clicked
  hide

when I receive game over
  go to front layer
  show
  go to x: 36 y: 28
  repeat 40
    change x by (-300 - x position) / 5
    change y by (-310 - y position) / 5
  repeat 40
    change x by (75 - x position)
    change y by (75 - y position) / 5
  hide

```

Sprite4

```

when clicked
  go to x: 0 y: -75
  go to back layer

define shift
  go to back layer
  set size to 60 %
  change x by -5

when I receive play
  go to x: 900 y: -95
  forever
    if touching Player ? then
      broadcast game over

when clicked
  hide

when I receive game over
  stop other scripts in sprite
  hide

```

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```
when I receive play
go to x: 900 y: -95
forever
  switch costume to costume1
  wait 2 seconds
  show
  go to x: 900 y: -95
  repeat until x position < -240
  shift
  hide
  switch costume to costume2
  wait 5 seconds
  show
  go to x: 900 y: -95
  repeat until x position < -240
  shift
  hide
  switch costume to costume2
  wait 5 seconds
  show
  go to x: 900 y: -95
  repeat until x position < -240
```

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```
shift
hide
switch costume to costume1
wait 5 seconds
show
go to x: 900 y: -95
repeat until x position < -240
shift
hide
switch costume to costume2
wait 5 seconds
show
go to x: 900 y: -95
repeat until x position < -240
shift
hide
```

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Score render:

Blocks

```

when I start as a clone
  show
  forever
    go to x: digits * space between digits - length of score! * space between digits / 2 y: 155
    if length of score! < digits then
      hide
    else
      show
      switch costume to letter digits of score!

when I receive play
  hide
  set digits to 1
  set space between digits to 10
  repeat 10
    create clone of myself
    change digits by 1

when I receive game over
  stop other scripts in sprite

when I receive play
  delete this clone
  
```

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Collectables

The image displays several Scratch code blocks for a game script, organized into two columns: 'Blocks' and 'Pyt'. The 'Blocks' column contains the following code:

- when clicked:** go to x: 0 y: -75, go to back layer, create clone of myself.
- when I receive play:** show, go to x: 900 y: -95, forever loop: wait pick random 5 to 10 seconds, show, go to x: 900 y: -95, repeat until x position < -238, shift, go to x: 900 y: -95, hide.
- when clicked:** switch costume to costume1, hide.

The 'Pyt' column contains the following code:

- when I receive play:** hide variable highscore, go to x: 900 y: -95, forever loop: if touching Player? then: hide, start sound Coin, change score! by 1.
- when I receive game over:** show variable highscore, stop other scripts in sprite, hide.
- when I receive play:** forever loop: wait 0.03 seconds, next costume.

Two 'define shift' functions are also shown:

- define shift (top):** go to back layer, set size to 60%, change x by -10.
- define shift (middle):** go to back layer, set size to 100%, change x by -5.

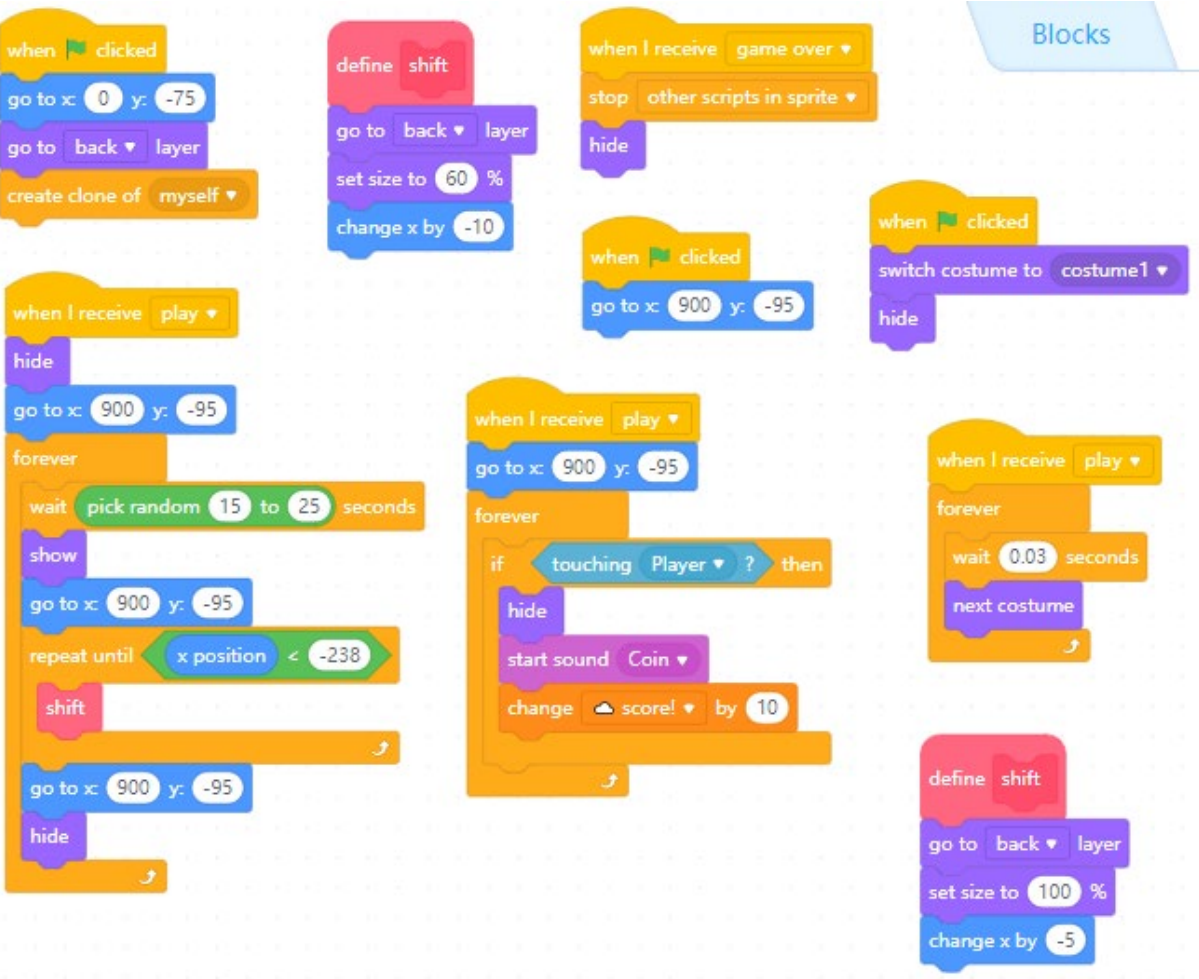
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Collectables2

Blocks



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Thundercloud

```
when I receive play
  show
  set ghost effect to 100
  go to x: 500 y: 28
  forever
    wait 7 seconds
    go to x: 500 y: 28
    repeat 10
      change ghost effect by -10
    switch costume to costume1
    repeat 40
      change x by pick random -5 to -8
    wait 1 seconds
    switch costume to costume2
    wait 2 seconds
    start sound Rip
    switch costume to costume3
    wait 2 seconds
    repeat 10
      change ghost effect by 10

when I receive play
  show
  set ghost effect to 100
  go to x: 500 y: 28
  forever
    if touching Player ? then
      broadcast game over

when clicked
  set ghost effect to 100

when I receive game over
  stop other scripts in sprite
  set ghost effect to 100
```

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Enemy2

```

when clicked
  set shield? to no
  go to x: 0 y: -75
  go to back layer
  create clone of myself

when I receive play
  go to x: 900 y: -95
  forever
    wait 25 seconds
    show
    go to x: 900 y: -95
    repeat until x position < -240
      shift
    hide

define shift
  go to back layer
  set size to 60 %
  change x by -12.5

when I receive game over
  stop other scripts in sprite
  hide

when I receive play
  go to x: 900 y: -95
  forever
    if touching Player? then
      if y position of Player > -60 then
        start sound Rip
        broadcast bounce
        change score! by 5
        hide
      else
        broadcast game over
  
```

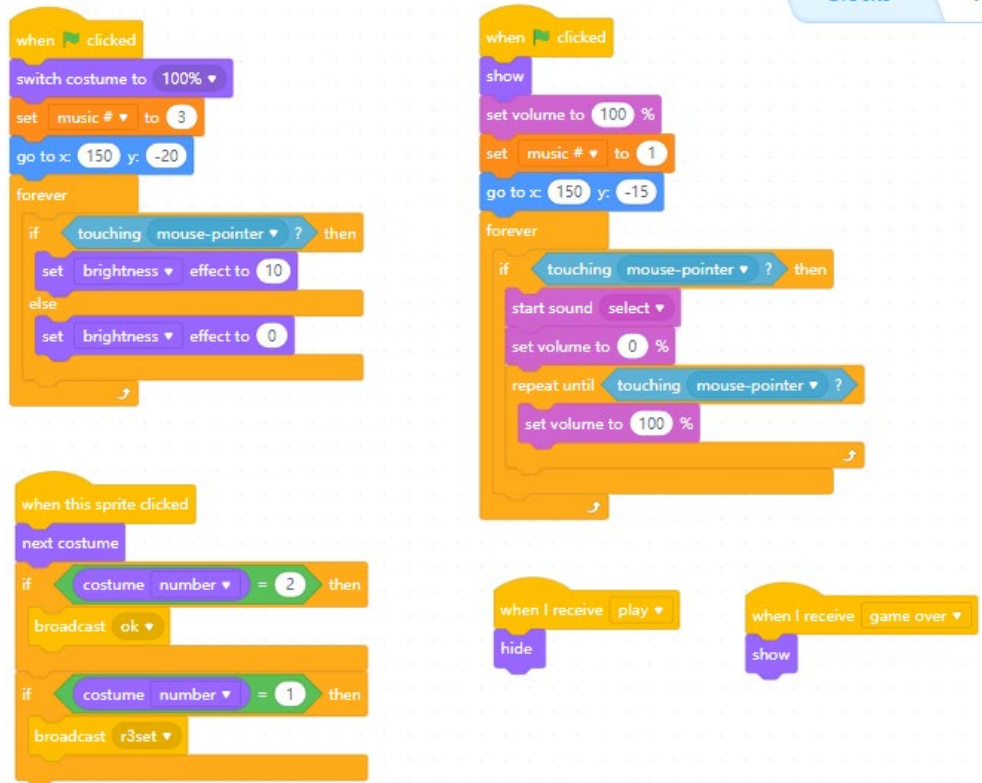
Sprite5

```

when clicked
  set size to 100 %
  go to back layer
  forever
    change size by 5
    change size by sin of size / 3
  
```

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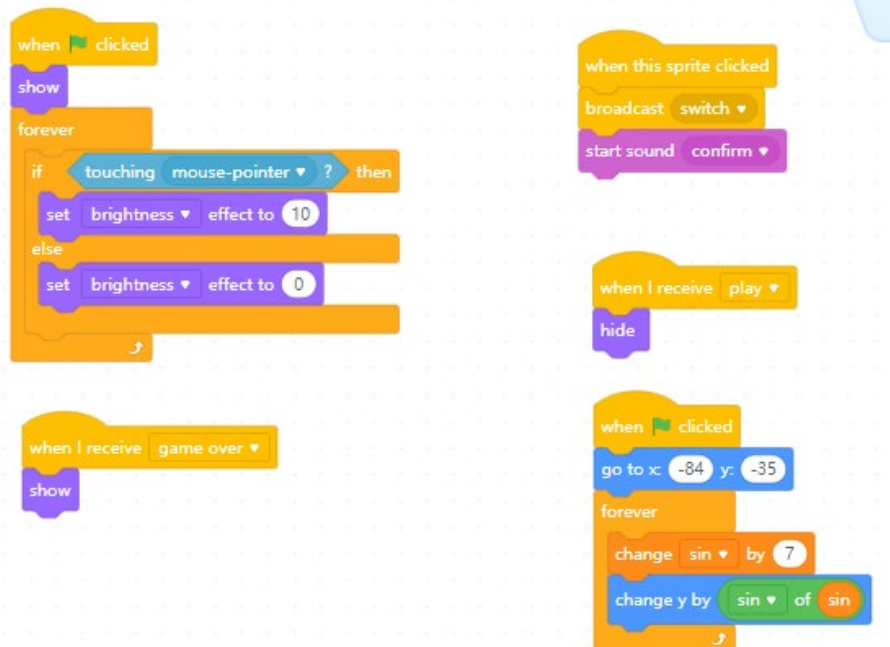
Music



The code for the Music section consists of several scripts:

- When clicked:** switch costume to 100%, set music # to 3, go to x: 150 y: -20, then a forever loop with an if-else statement for touching mouse-pointer (brightness effect to 10 or 0).
- When this sprite clicked:** next costume, if costume number = 2 broadcast ok, if costume number = 1 broadcast r3set.
- When I receive play:** hide.
- When I receive game over:** show.
- When clicked (right side):** show, set volume to 100%, set music # to 1, go to x: 150 y: -15, then a forever loop with an if-else statement for touching mouse-pointer (start sound select, set volume to 0, repeat until touching mouse-pointer, set volume to 100).

Sprite6



The code for the Sprite6 section consists of several scripts:

- When clicked:** show, then a forever loop with an if-else statement for touching mouse-pointer (brightness effect to 10 or 0).
- When this sprite clicked:** broadcast switch, start sound confirm.
- When I receive play:** hide.
- When I receive game over:** show.
- When clicked (bottom right):** go to x: -84 y: -35, then a forever loop with change sin by 7 and change y by sin of sin.

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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 more enemies, new animations, etc.

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