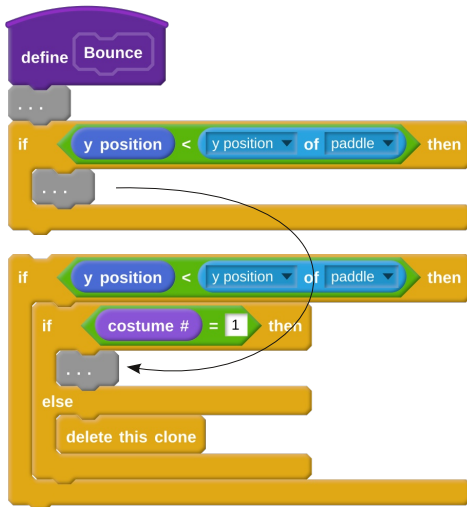


Bonus: extra balls 3

Finally, we only lose a life, when the original ball drops. The clones simply "disappear".

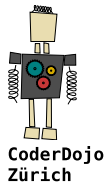


Creative Commons License CC-BY-SA

Coderdojo Zürich, Ale Rimoldi

Inspired by Brunus-V's Breakout game:

<https://github.com/Brunus-V/Scratch-games>.



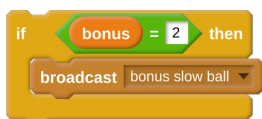
Breakout

Hit all the bricks with the bouncing ball.



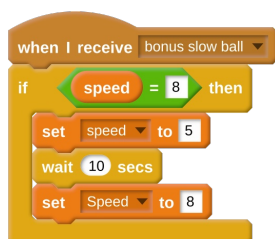
Bonus: a slow ball

When the player catches a "Slow ball" bonus (the number 2) the ball gets slower.



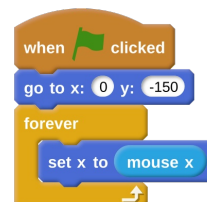
Bonus: a slow ball 2

The ball listens to the "bonus slow ball". Then, if the speed is currently the normal one, set the variable to the lower value, wait 10 seconds, before setting the speed value to its normal value.



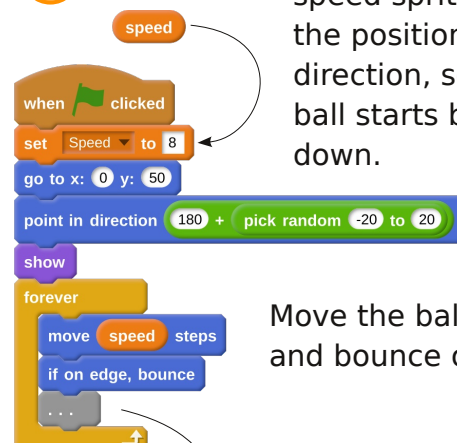
Move the paddle

Draw a paddle or pick it from the Scratch library. Place it towards the bottom of the screen.



A bouncing ball

First, initialize the speed sprite variable, the position and the direction, so that the ball starts by going down.



Move the ball at its speed and bounce on edges

See on the next page for the bouncing on the paddle...

Breakout






A ball bounces around.

With the paddle you make sure that it does not fall down to the ground.

The goal is to hit all the bricks with the ball.

Preparation

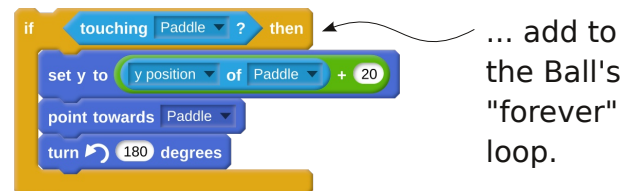
You will need for the game:

- a ball, 
- a paddle, 
- a wide paddle costume, 
- bricks of different colors, 
- (one costume per color)
- pills with super powers. 

Pick the sprites from the library or draw them yourself.

1

The ball and the paddle



When the ball touches the paddle it will bounce to the left or to the right, depending on which part of the paddle is touched, more or less steep, depending on how close ball is to the center of the pad:

- First, move up by 20 px so that it does not touch the paddle anymore.
- Then point to the center of the paddle.
- Finally invert the direction (turn by 180°)

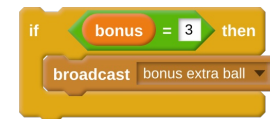
Try it out!



Click on the green flag: the ball will bounce around and the pad follow the mouse.

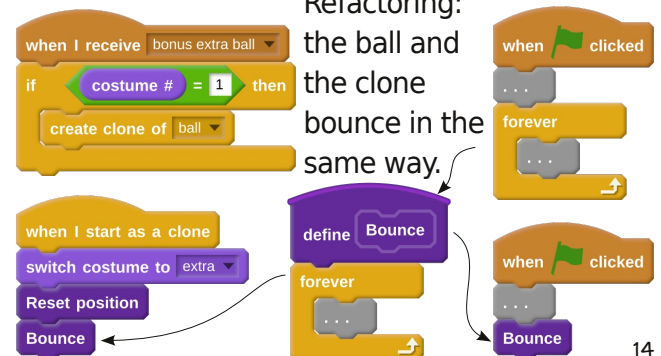
Bonus: extra balls

Each time the player catches an "Extra ball" bonus (the number 3) one more ball starts bouncing around.



Bonus: extra balls 2

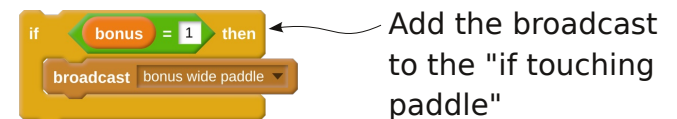
The ball listens to the "bonus extra ball". If costume is the normal one, create a clone. What does a clone do? It changes the costume to "extra", goes to the start position and starts bouncing.



14

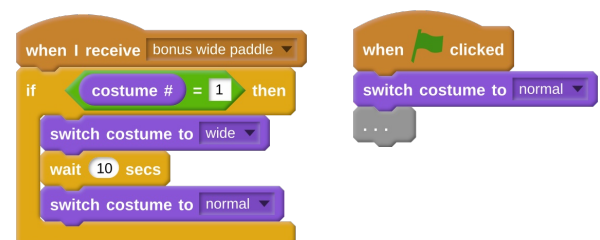
Bonus: a wide paddle

When the player catches a "Wide Paddle" bonus (the number 1), the paddle gets wider. It will return to the normal size after 10 seconds.



Bonus: a wide paddle

The paddle listens to the "Bonus Wide Paddle". It then switches to a costume with a wider paddle and waits for 10 second before switching back to the normal costume.



Drop the pills 3

Create a "Bonus" sprite variable.
If the random value is bigger than 3 (3 chances out of 4) just do nothing and delete the clone...

The code starts with a 'when I start as a clone' block. It sets a 'bonus' variable to a random number between 1 and 12. An annotation asks '1 to 12? We have three bonus and 1/4 chance: $3 * 4 = 12$ '. An 'if' block checks if 'bonus > 3'. If true, it deletes the clone. Otherwise, it switches costume to 'bonus', goes to 'Bonus start X' and 'Bonus start Y', and shows the clone. A 'repeat until' loop runs while 'y position > y position of paddle'. Inside, it changes y by -6. An 'if' block checks 'touching paddle?'. If true, it broadcasts a message 'the bonus messages...' and deletes the clone. Finally, it deletes the clone.

Losing a life

When the ball drops below the paddle, decrease the number of lives, then the ball goes back to its start position.

The code starts with a 'when green flag clicked' block. It sets a 'balls' variable to 3. An annotation says 'First create the "Ball" variable (for all sprites) and initialize it to the number of lifes.'

The code continues with an 'if' block: 'if y position < y position of Paddle then'. Inside, it hides the ball, changes 'balls' by -1, goes to x: 0 y: 50, points in direction '180 + pick random -20 to 20', shows the ball, and waits 2 seconds.

In the forever loop on page 2 we add a check for the ball position being below the paddle. If it's the case, we decrease the number of lifes and – after two seconds – move back to the start position.

4

Colorful bricks

We set different colors for each row and on the second row add three gray bricks that cannot be destroyed.

The code starts with a 'define Set Style' block. It switches costume to 'row + 1'. An 'if' block checks 'row = 1'. If true, it has another 'if' block: 'if column = 3 or column = 6 or column = 9 then'. Inside, it switches costume to 'gray'. An annotation says 'Create 4 costumes of different colors, the forth being the gray one.'

Then, a 'When I start as a clone' block is shown. It has a 'Set Style' block, followed by a 'show' block. An annotation says 'Add "Set style" just before the clone is shown... Put an "if" around the blocks between "wait until" to "delete this clone".'

An 'if' block checks 'not costume # = 4'. If true, it waits until 'touching ball?' and then deletes the clone.

A 'Winner' label is shown with 'Wins = 3'. An annotation says 'In the winner, wait until 3 bricks are left, not 0.' Below it, a 'wait until' block checks 'bricks = 3'.

Game Over

Game Over

We keep an eye on the number of balls left and trigger a "Game over" when no we have lost all balls.

The code starts with a 'when green flag clicked' block. It hides the game over screen. Two 'wait until' blocks follow: 'wait until balls > 1' and 'wait until balls < 1'. An annotation says 'First, wait until at least one brick has being cloned: otherwise it might stop as soon it starts.' It then shows the game over screen and stops all.

Draw the bricks

We are now drawing three rows of bricks. We draw the brick zero. We keep it hidden and place somewhere in the left top corner.

The code starts with a 'when green flag clicked' block. It hides the bricks and goes to x: -210 y: 160.

We have made some calculations and if our bricks are 30 by 15 pixels we can fit them in 13 columns and 3 rows.

6

Refactoring

You might have noticed, that the code for the initialization is very similar to the one for resetting the position after the ball has been missed.

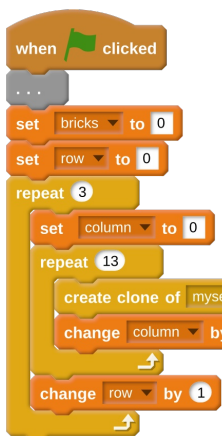
Let's refactor the code and create a "Reset position" block.



We can use "Reset position" for both the "initialization" and when moving back to the start position:

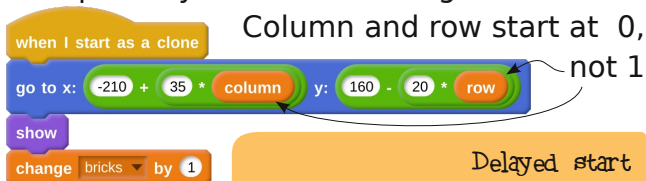


5



We keep track of the number of bricks, the row and the column, and we create each brick as a clone of the brick 0. Important notice: "row" and "column" must be for the sprite only. That way, each brick knows where it is. "bricks" is a global variable.

Each column is 35 wide and the rows 20 high. Each clone position is calculated by adding to the origin the index (column or row) multiplied by the width or height.



Delayed start

Add a "wait" between the "reset" and the "bouncing"



Drop the pills

When the ball hits a brick, there is one chance in four to have a falling pill. If the player catches the falling pill, she/he will get a bonus.



- Create the global variables "bonus start X" and "bonus Start Y"
- Towards the end of "When I start as a clone, just before deleting the clone..."
- ... Set "bonus Start X" to the current "x position" and "bonus Start Y" to the "y position"
- Broadcast the "Drop bonus" Message.

Drop the pills 2

Draw a pill. When the game starts it hides itself and when a brick broadcasts a "Drop bonus" it clones itself...



10

Hit the brick



Add it to the "When I start as a clone" code. When a brick is hit by the ball it disappears...

Hit the brick 2

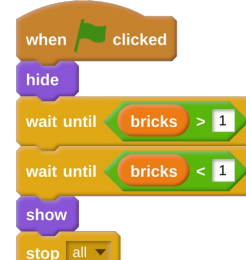


Add it to the "Forever" loop. ... And when the ball hits a brick, it inverts its direction.

(If the bricks do not disappear, wait 0.1 seconds before changing direction.)

Winner

The Winner



The "Winner" sprite is hidden and wait for the number of bricks being back down to 0 before showing.

First, wait for at least one bricks being cloned: otherwise it might stop as soon it starts.

8