



Hour of Code 2021 – Activity Guide

Tennis

Workshop Outline

The objective is to build a Tennis game in Scratch where one Player plays against the computer. The first player who reaches 5 points wins the game.

Learning Objectives:

- Familiarity with the Scratch environment: sprite, stage and scripts
- Motion: Using the **keys** to control the main character movements
- Interaction: Sensing a specific sprite

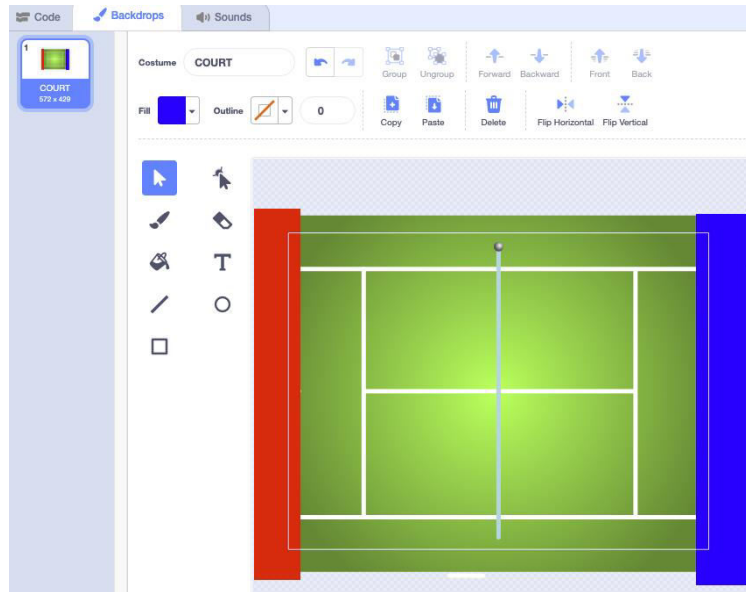
Materials and resources:

- Scratch Account (Recommended)- Scratch info [link](#) - Account info [link](#)
- Scratch starter project OPTIONAL - [LINK](#)
- Scratch completed project - [LINK](#)

Let's Code

Customize the Court

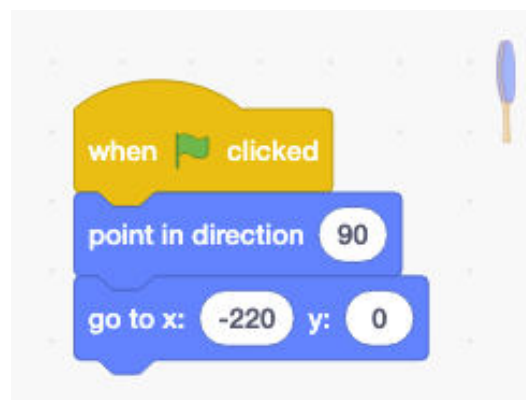
In the provided background what do you think those red and blue rectangles are for?



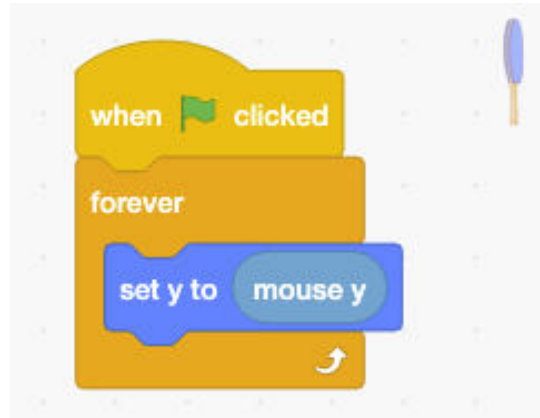
Coding the Player Paddle Sprite – Blue Paddle

We provided a Blue Paddle Sprite for you to use, but feel free to change it any way you like. This Sprite needs two sets of instructions, the first one to set the starting position and direction of the Sprite and the second one to make the Sprite follow the movement of the mouse up and down.

1. Set the initial position and direction of the Paddle Sprite:



2. Have the Paddle Sprite follow the mouse up and down:

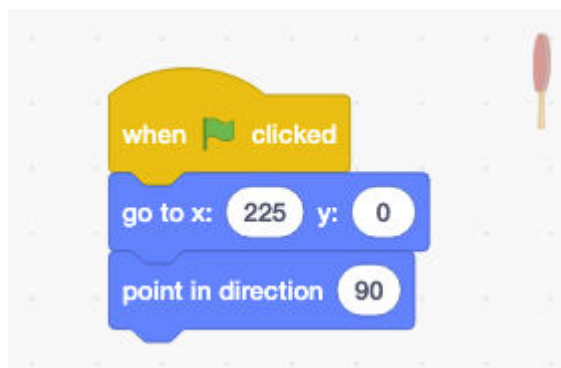


Find the **mouse y** block in the **Sensing** section

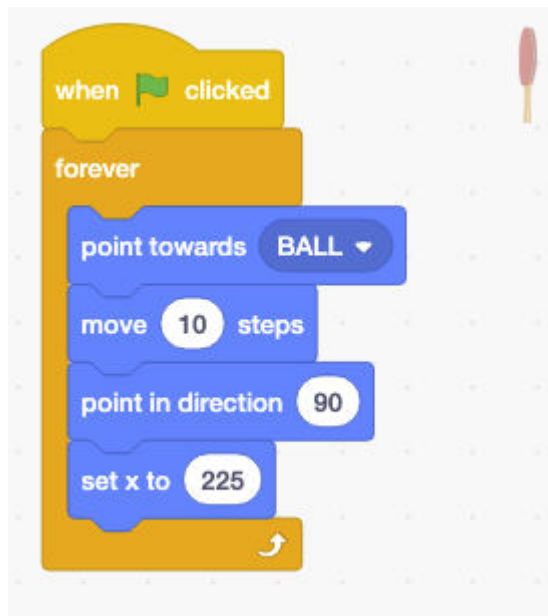
Coding the Computer Paddle Sprite – Red Paddle

We also provided a Red Paddle Sprite for you to use. Once again, feel free to change it any way you like. This Sprite also needs two sets of instructions, just like the Blue Paddle did. The first one is to set the starting position and direction of the Sprite. The second set of instructions is a bit different as it should be controlled by the computer and not the player. Take a look at the code and we'll go over some of the details.

1. Set the starting position and direction of the Sprite. This is the same as the Blue Paddle:



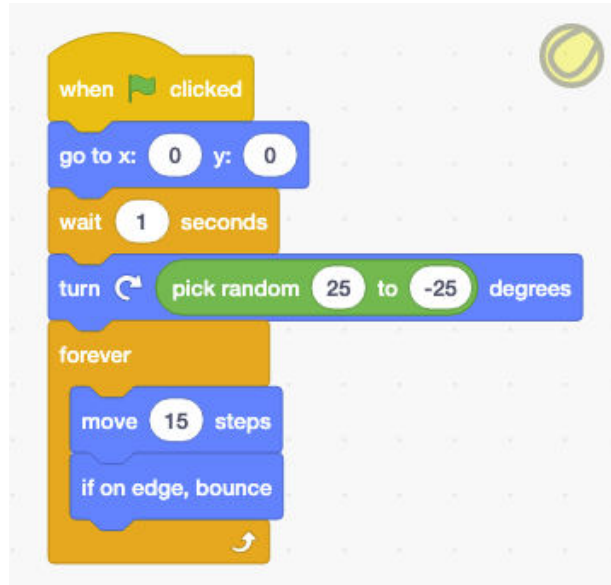
2. Blocks to have the computer control the paddle:



These blocks run as long as the game is being played and makes the Paddle face the ball and move up and down without changing the position horizontally. Remove some of the blocks and try to explain what is happening. Once you're done exploring, move to the next step!

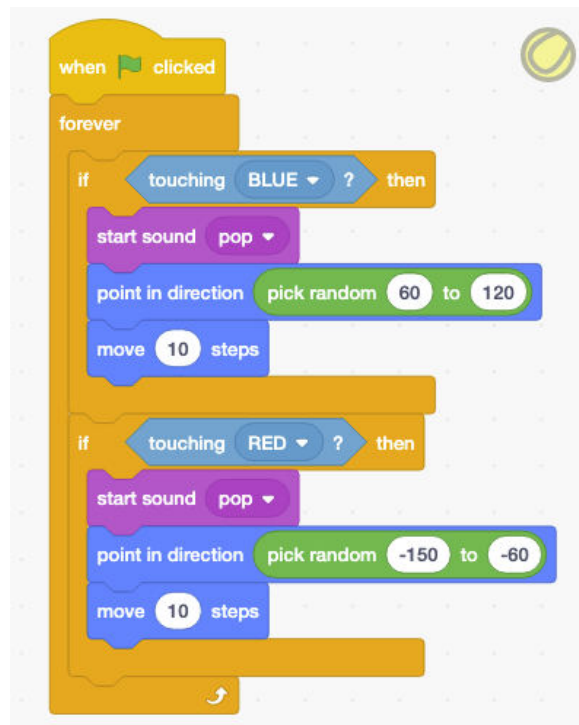
Coding the Ball Sprite

1. In this step we are going to set the initial position of the ball and will make it move from left to right, bouncing back when it reaches the edge:



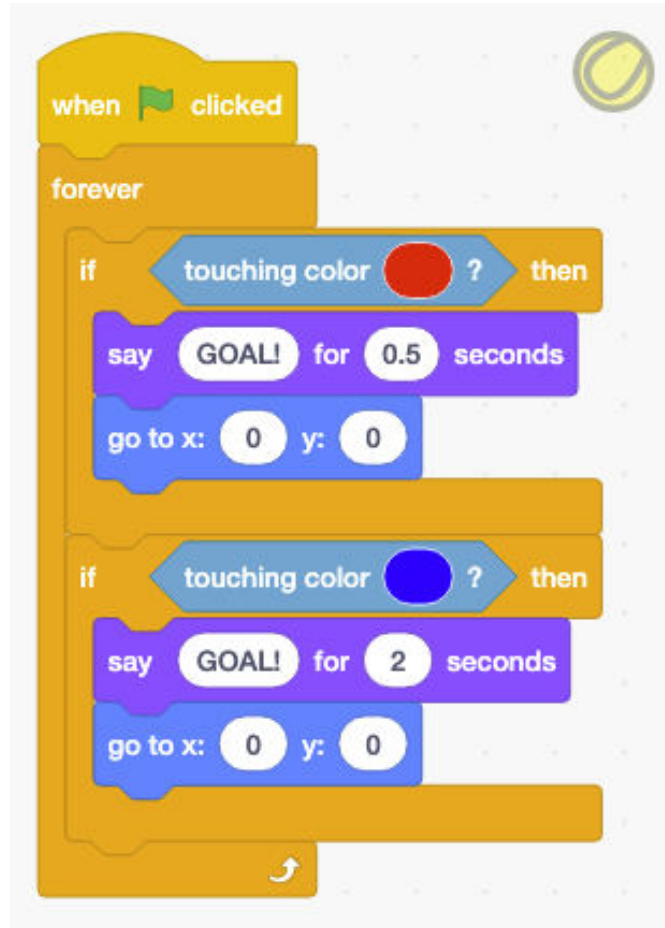
```
when green flag clicked
  go to x: 0 y: 0
  wait 1 seconds
  turn pick random 25 to -25 degrees
  forever loop
    move 15 steps
    if on edge, bounce
```

2. The next piece of code will check if the ball is touching the Paddle and bounce back:



```
when green flag clicked
  forever loop
    if touching BLUE ? then
      start sound pop
      point in direction pick random 60 to 120
      move 10 steps
    if touching RED ? then
      start sound pop
      point in direction pick random -150 to -60
      move 10 steps
```

3. Now we need to make use of the mysterious red and blue squares we have in the background. The idea is that they will help detect if the player misses hitting the ball, display a message and reset the position.

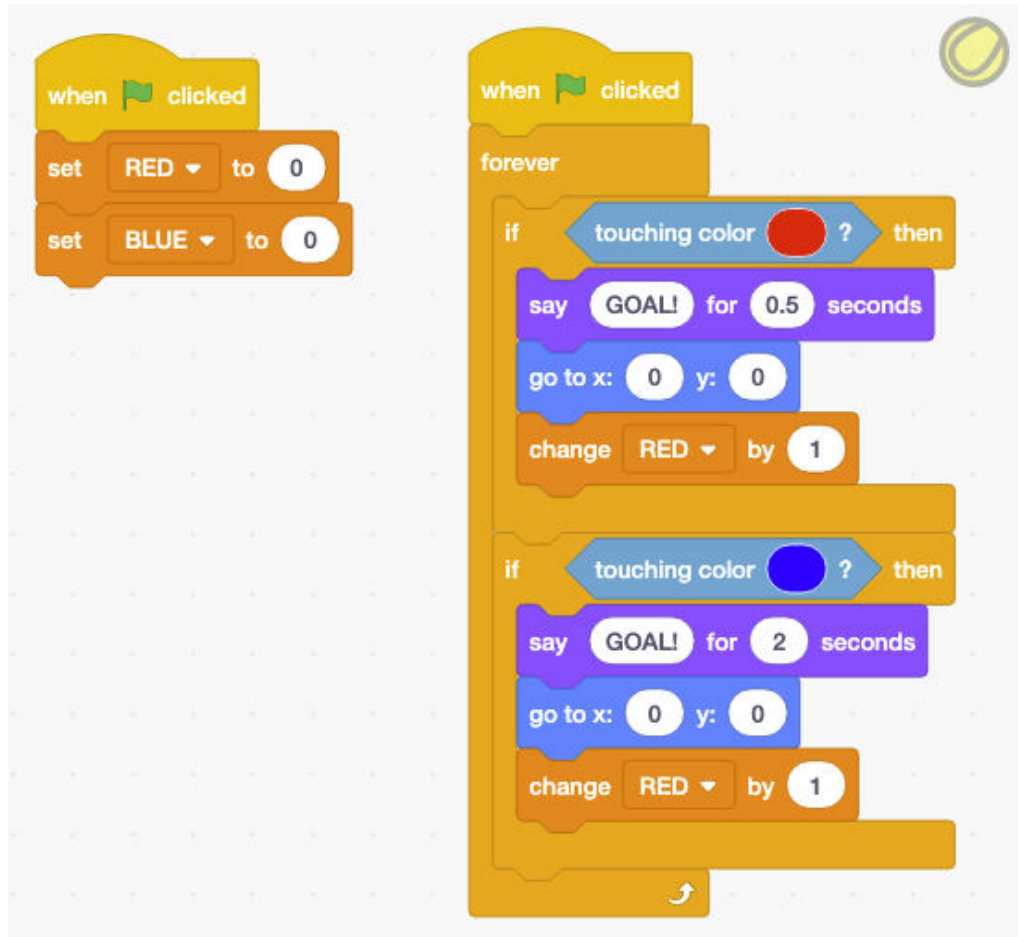


The colours inside the **touching color** block need to be the same as the colours of the bars at the edges of the court. Use the following values to make sure that the colours match:

Red: Color 0 - Saturation 100 - Brightness 100

Blue: Color 63 - Saturation 100 - Brightness 100

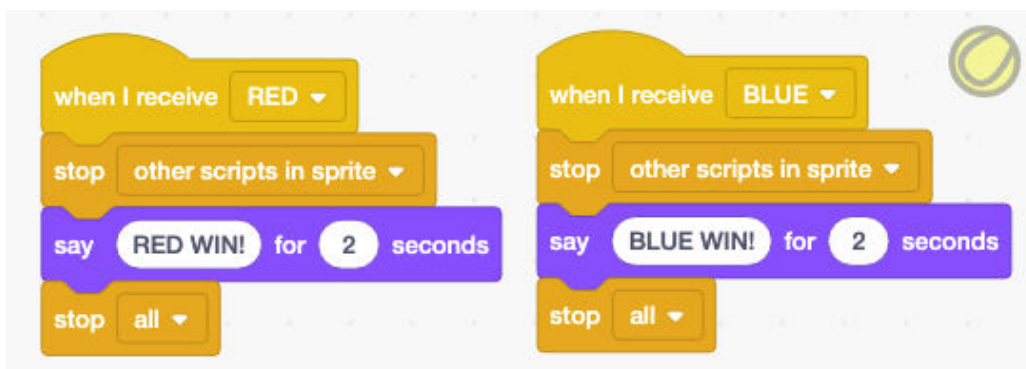
4. Create two variables (RED and BLUE) and add the code on the left to set them to zero when the game starts. Also modify the code we just created to include blocks that increase the score every time the ball hits the red or blue wall as seeing below:



```
when green flag clicked
  set RED to 0
  set BLUE to 0

forever loop
  if touching color red then
    say GOAL! for 0.5 seconds
    go to x: 0 y: 0
    change RED by 1
  if touching color blue then
    say GOAL! for 2 seconds
    go to x: 0 y: 0
    change RED by 1
```

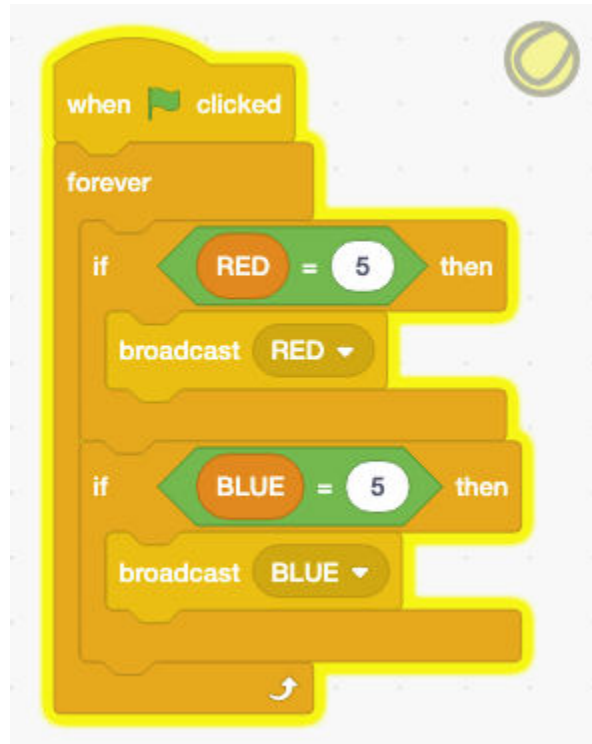
5. We are almost done. The game needs to know who won, and for that we need two more sets of blocks that will get a message, stop the game and declare the winner.



```
when I receive RED
  stop other scripts in sprite
  say RED WIN! for 2 seconds
  stop all

when I receive BLUE
  stop other scripts in sprite
  say BLUE WIN! for 2 seconds
  stop all
```

- The last step is to add code to check the score and send a message for the code above to end the game and declare the winner as soon as one player gets 5 points:



Great work! You have created a Tennis game using Scratch. Try some of these extensions:

Extensions

- Add a timer that ends the game after 2 minutes
- How would you have a friend play with you instead of the computer?
- What other sport could you represent by changing the images (background, paddles, ball)?