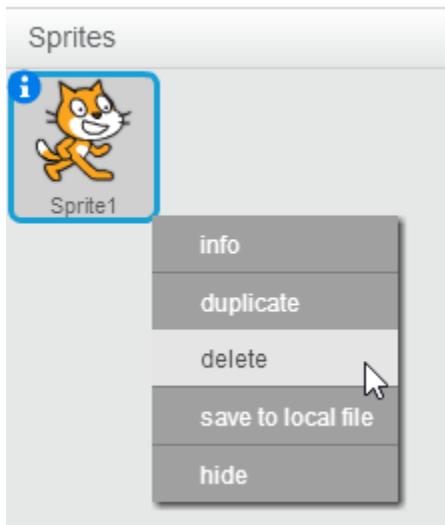


# Introduction to Scratch

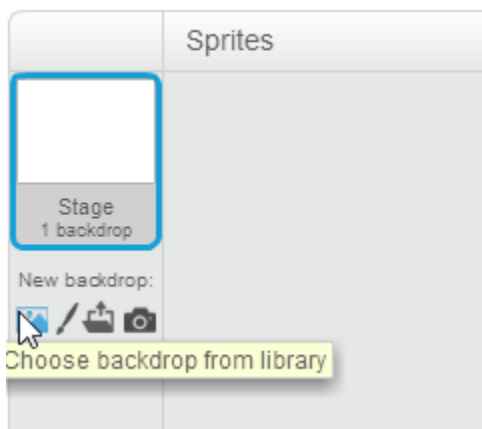
Create a simple ball game using the free app Scratch!

## Get started:

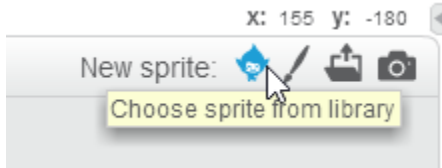
1. Go to <https://scratch.mit.edu>.
2. In the top navigation bar, click "Create".
3. Delete the existing Cat Sprite by right clicking Sprite1 and select Delete.



4. Choose your own backdrop from the bottom left corner!



5. Let's add a Sprite!

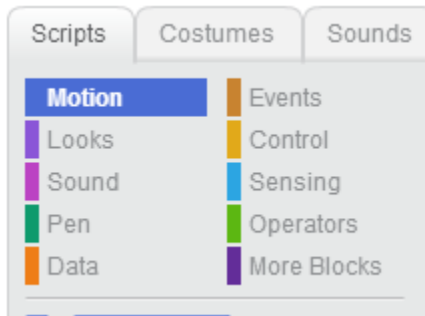


We will be using the Ball Sprite.



Ball

6. Familiarize yourself with the Script sections and browse through all of them.






7. To place a block, drag it to the right side of the screen. Let's try going to Events and place this block:



8. To attach a block to an existing block, drag it to where you want to place it and make sure it clicks.



9. As you may have noticed, every time you click on the Green Flag  , the ball will move a short distance to the right. To get it to move continuously, we will now add a loop!

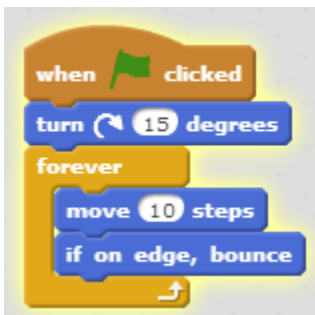
10. Surround the  block with a forever control loop. You will end up with something that looks like this:



Click on the Green Flag and see what happens!

11. Oh no! Our ball is stuck on the right hand side. To get it unstuck, let's have it bounce if it's on an edge. Remember to always do this part so, so we want to make sure it's within our forever loop. Hint: Bouncing is a motion!

12. Now that it's bouncing side to side, we want to add a little bit of chaos and have it turn 15 degrees only once when we click the flag. Your code should now look like this:



13. It's great that there's a bouncing ball, but it's not a really fun game. Let's add a new Sprite! This time we'll be using Paddle:



Paddle

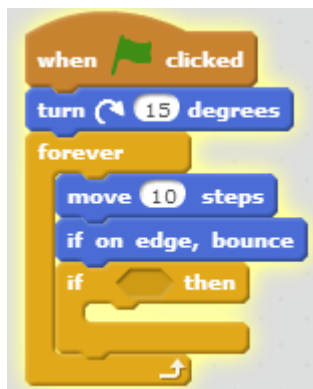
14. You'll notice that the Paddle starts off in the middle of the screen, but we want to move it closer to the bottom. To do this, add a When Flag Clicked Event, then set the y position to -150.
15. Now that the Paddle is closer to the bottom of the screen, we want to be able to control it! We will need to use a key press Event to do this. To make it go side to side, we will want a right arrow key press Event and a left arrow key press Event.



- To make sure that the Paddle goes in the correct direction, we'll want to have it point in a certain direction when that arrow is pressed. To do this, look in Motion to find a point in direction block and select the correct direction from the drop down menu on the block.
- Now we want the Paddle to actually move, so let's make it Move 20 Steps every time you press either the right arrow or left arrow key.



- Now that our Paddle moves, we need to go back to our Ball Sprite so that it doesn't just go through our Paddle. We'll want to set it so that if it touches the Paddle, then it will bounce away from it. To do this, we'll need to use an if then loop from our Control scripts.



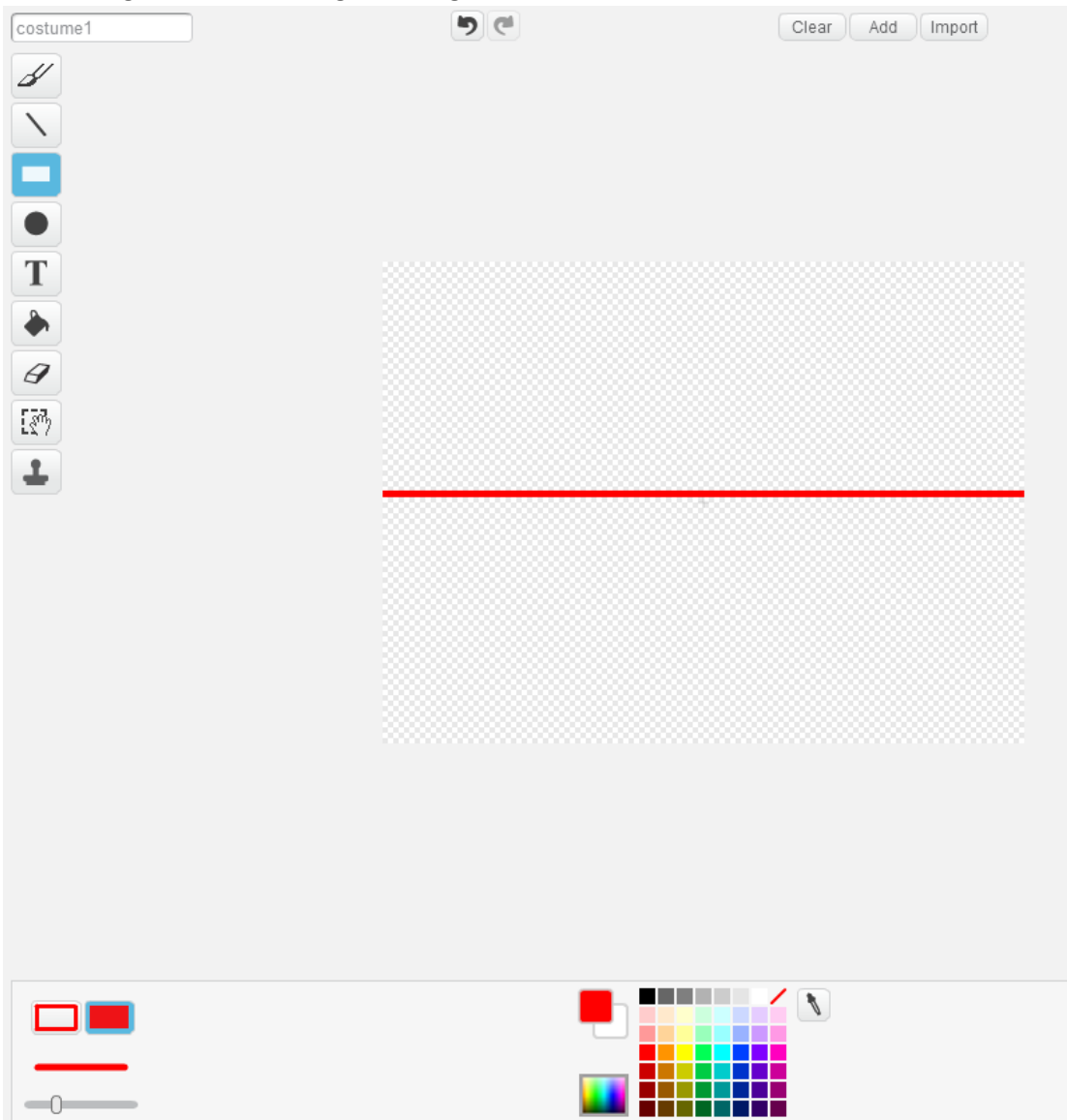
- Now we need our Ball to Sense that if it's touching the Paddle, it needs to turn. To add a bit of randomness to the turn, we want to use an Operator to pick a random degree between 160 to 200.



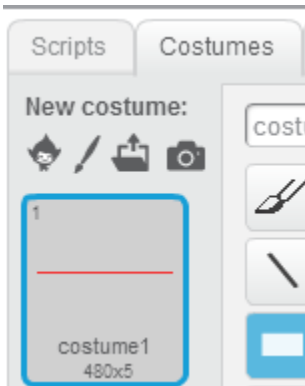
- Now to add a bit of difficulty to the game! Let's Paint a New Sprite!



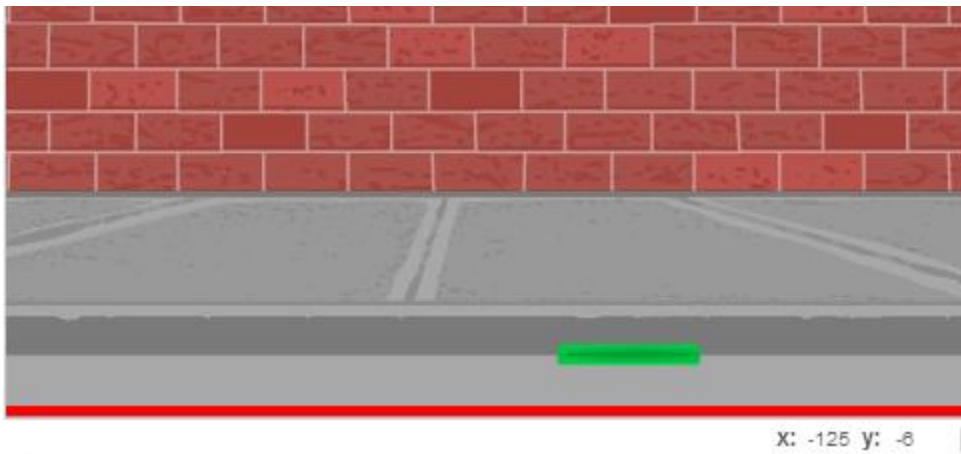
21. We want to paint a straight line across the entire drawing screen, we would recommend using the rectangle tool for this to get a straight line:



22. Switch back to our Scripts tab.

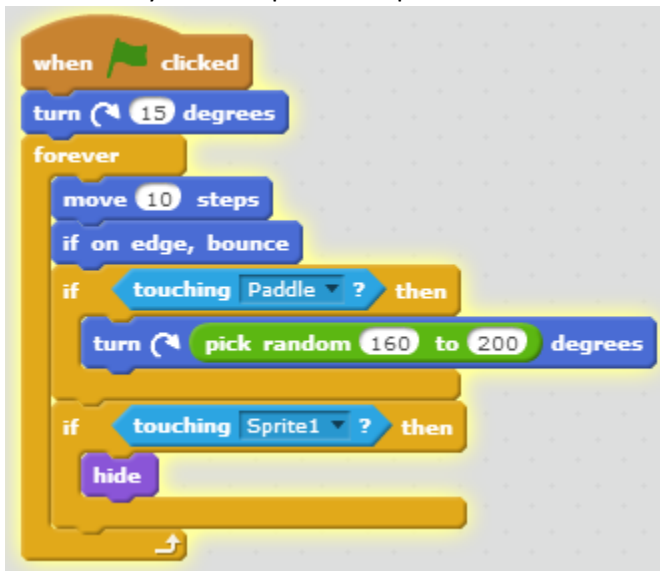


23. You'll notice that our new Sprite is added to the middle of the screen, we want to move this Sprite to the very bottom of the screen so to do this, we can just drag the Sprite1 to the very bottom and centered.



24. Let's make it so that if our Ball touches the line, we unfortunately lose and we want to make it so that our Ball Sprite disappears (Hint: use hide in Looks). Do you remember how to use an if statement and set it so that if it's touching another Sprite, then something happens?

25. Here's how your Ball Sprite's Script should look:

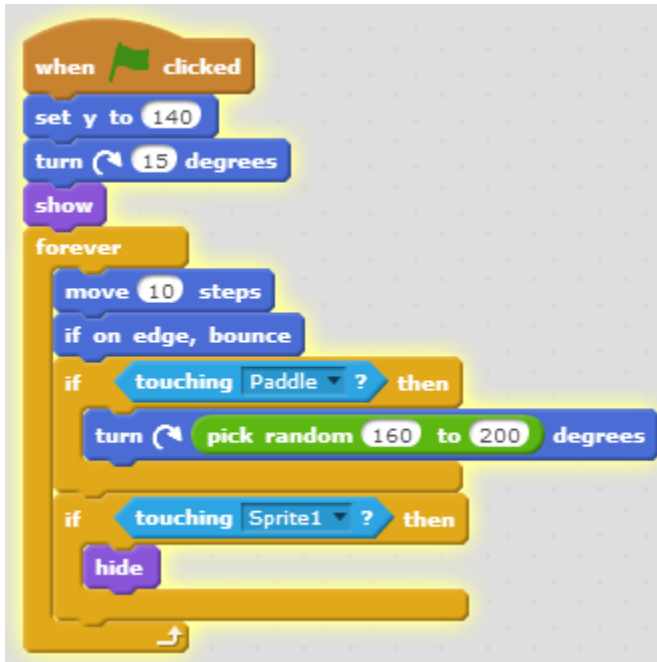


26. But wait! When we try to start a new game, the Ball isn't appearing! We want to make sure that we add a show block at the beginning of our Script, before our forever loop.

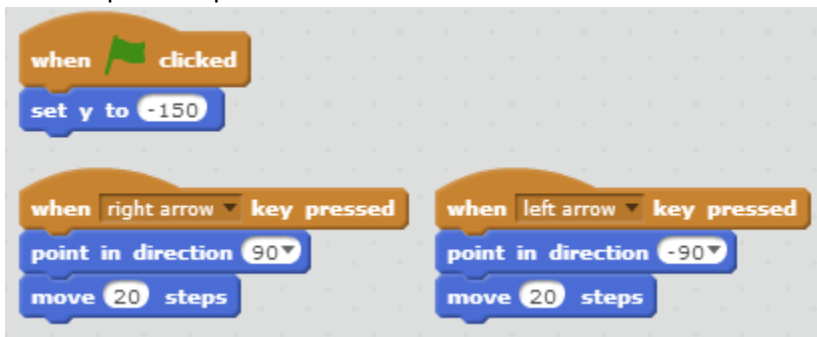
27. Oh no! Sometimes the Ball starts so close to the very bottom of the screen, there's no time to catch it! Let's set a starting position for our Ball to the center of the display screen by setting a y position to 140 when you click the flag.

28. All done! Let's check our work:

Ball Sprite Script:



Paddle Sprite Script:



29. Now it's your turn to think of ways to extend this game! What can you do to add more to the game? Here are some suggestions:

- Adding a second ball
- Making the ball go faster every time you're able to hit it with the paddle
- Add more Lives so that you can touch the line at the bottom more than once before the game is over
- Change backdrops every 10-20 times you hit the ball with a paddle
- The list goes on! Be creative and have fun!

To learn more with us, sign up for a CodeCrafters class! For more information, please reach out to [hello@hackademy.ca](mailto:hello@hackademy.ca).

