

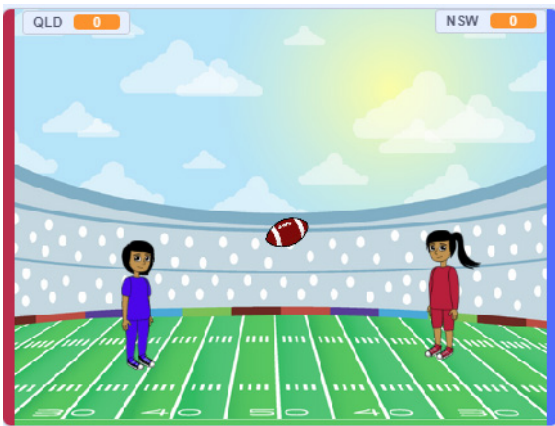
CODE OF ORIGIN



Kick off!

Create a football game where Queensland versus New South Wales.

INTRODUCTION



What you will need

HARDWARE

A computer capable of running Scratch 3

SOFTWARE

Scratch 3:
either online
[rpf.io/scratchon](https://scratch.mit.edu/projects/755339080)
or offline
[rpf.io/scratchoff](https://scratch.mit.edu/projects/755339080)

What you will learn

- How to use sensing blocks
- How to use variable and operators together
- How to use broadcast

Additional notes for educators

Here is a link to the completed project
<https://scratch.mit.edu/projects/755339080/>

Read this blog post for curriculum links, resources and information about the Code of Origin project by Code Club Australia.

<https://scratch.mit.edu/projects/755339080/>

Starter Project

<https://scratch.mit.edu/projects/756091444/>



STEP 1 - PLAYERS

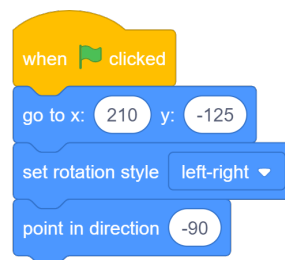
Open the starter project - <https://scratch.mit.edu/projects/756091444/>



Select the QLD sprite

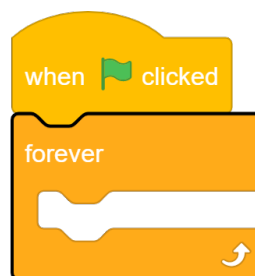


Start with the event **when the flag is clicked**. Set the conditions for the player by adding a **motion block** for its starting location. The sprite needs to turn to the opposite direction. Add blocks to **set rotation left to right** and **point in direction -90**.

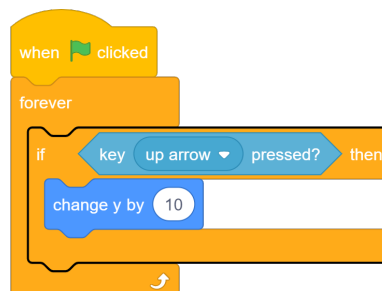


The next algorithm will code how the user will control the player.

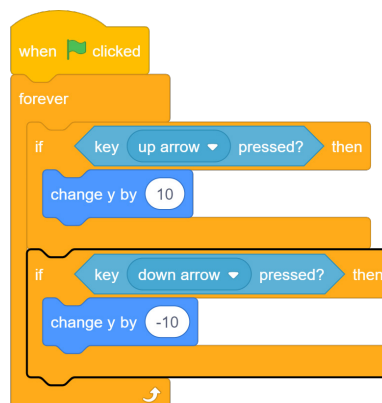
Start with the event **when flag is clicked**. Add a **forever block**.



The first **if then** block determines **pressing the up arrow** will **change y by 10**.



The second **if then** block determines **pressing the down arrow** will **change y by -10**. Hint - make sure the if then blocks are sitting under each other.





Add a block underneath the if then blocks, that tells the sprite to **bounce** if it touches the edge.



```
when green flag clicked
forever loop
  if key up arrow pressed? then
    change y by 10
  if key down arrow pressed? then
    change y by -10
  if on edge, bounce
```



Test your code. Your Queensland player should move up and down using the up and down arrow keys.



Now to code your New South Wales player.

HINT - drag and copy your Qld code onto your NSW sprite. Then change the details.



```
when green flag clicked
go to x: -200 y: -125
point in direction 90

when green flag clicked
forever loop
  if key w pressed? then
    change y by 10
  if key s pressed? then
    change y by -10
  if on edge, bounce
```



Test your code. Both players should be able to move on your screen at the same time.



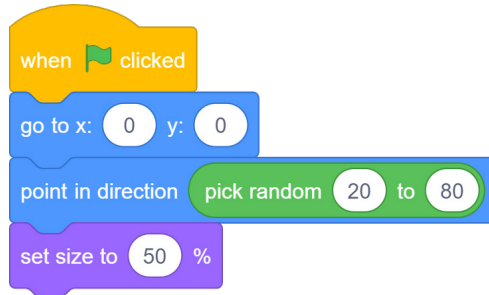
STEP 2 - CODING THE BALL



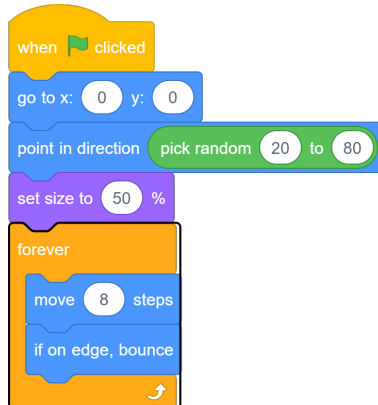
Select the ball sprite. Our first algorithm will control the balls movement.



Start with the event **when the flag is clicked**. Set the conditions for the ball by adding a **motion block** for its starting location. When it first moves code it to **point in direction random from 20-80**. The sprite needs to be **set to size 50%**.



Add a **forever block**. Code the ball to **move 8 steps** and **if on edge, bounce**.



Test your code. The ball should move around the screen and bounce off the edges. Let's add some scoring to our game



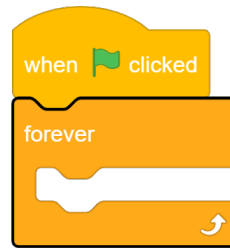
Create 2 new **variables**. Call 1 QLD and the other NSW. Add 2 variables blocks to the code, before the forever block, that **sets score to 0** for both NSW and QLD.



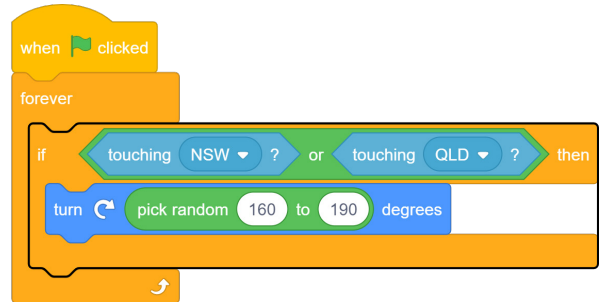
STEP 3 - DEFLECTING THE BALL



Start a new algorithm **when the flag is clicked** and add a **forever** block.



The algorithm needs to control the ball so that it deflects when it touches a player. Add an **if then** block that has an **or operator**. In each bubble add **sensing blocks for touching NSW or QLD sprites**. Then add a motion to **turn the ball** in a **random** direction.

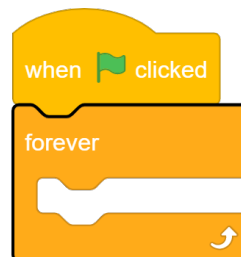


Test your code. The ball should change direction when a player blocks it.

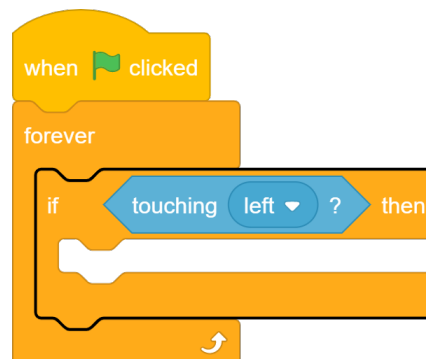
STEP 4 - SCORING A TRY



Start a new algorithm **when the flag is clicked** and add a **forever** block.

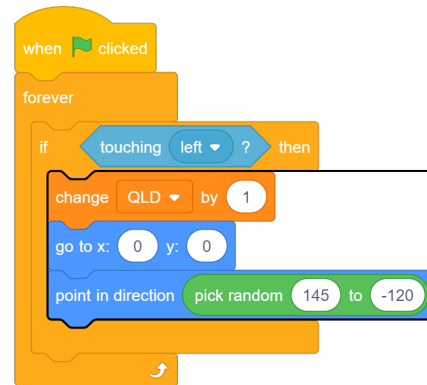


Add an **if then** block and inside it add the sensing block for **touching sprite left**.

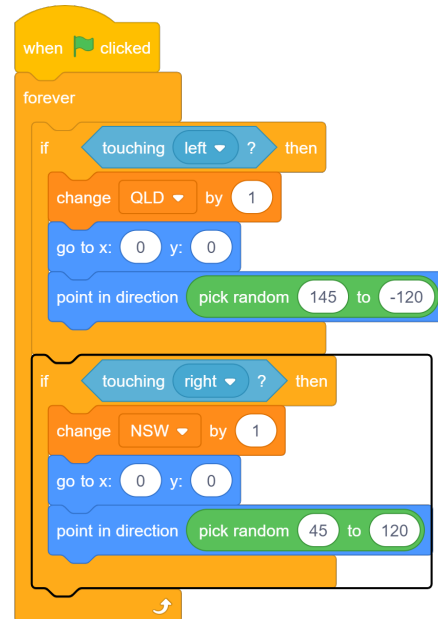




Add blocks inside the if then block that **changes the QLD score by 1** if the sprite is touched. Then we want the ball to **go to** it's starting position and select a **random direction** to start moving.



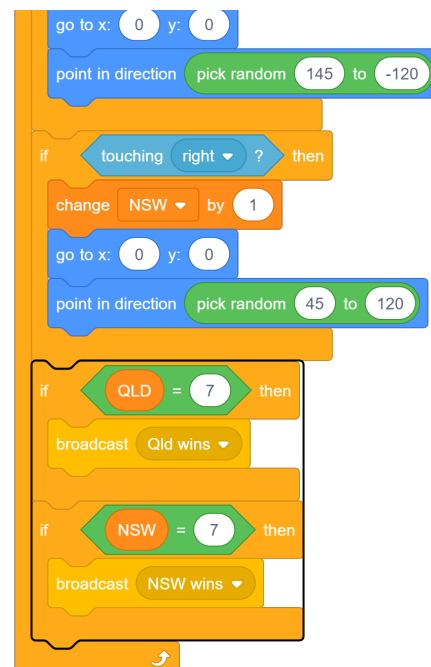
Duplicate the **if then** block (right click on the block and select dupliate) and add it underneath the first one. Change the **sprite it is touching**, and then change the **score** and **direction**.



Let's set some conditions to find the winning team.

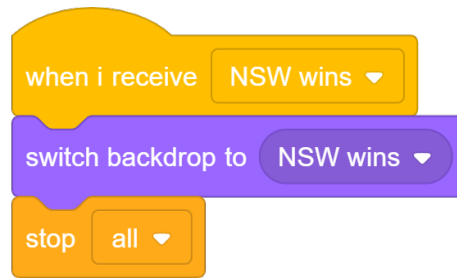
Add an **if then** block underneath that has an **= operator**. Add in the **QLD variable** and 7, so that if the score reaches 7 a **broadcast of Qld wins** is sent.

Duplicate the block and change the conditions if NSW is the winner.





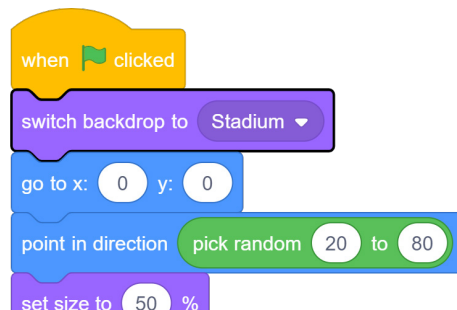
Start an event **when I receive NSW wins**. Add blocks to **switch backdrop to NSW wins** and **stop all**.



Start an event **when I receive Qld wins**. Add blocks to **switch backdrop to Qld wins** and **stop all**.



If the backdrop will change when the game ends, we will need to add code so that the **backdrop switches to stadium** when the game first starts.



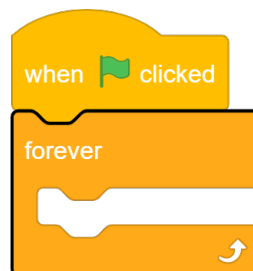
Your game is complete! Test it out.



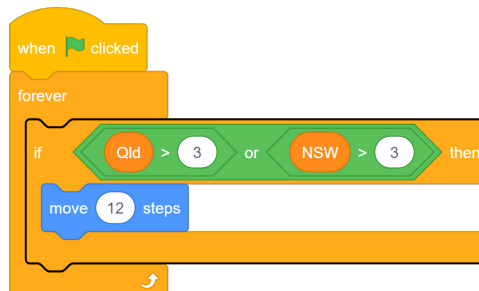
Let's add a layer of difficulty. Let's code the ball to increase in speed as the score increases.



Start a new algorithm **when the flag is clicked** and add a **forever** block.

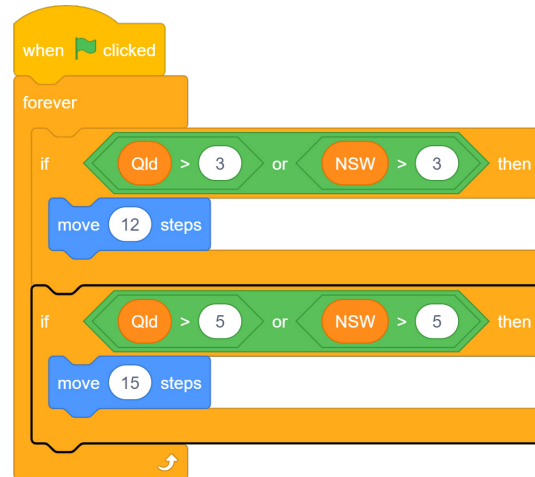


Add an **if then** block that has an **or operator** inside it. Add in 2 more **operators** that are both more than. Code one side to be if **Qld** is more than 3 and the other side to be if **NSW** is more than 3. Inside it add a **move 12 steps** block.





Duplicate the block. This time code it to move 15 steps if the score is greater than 5.



Test your game with a friend. Who is the winner?

Challenges:

Swap ends

In a football match at half time, the teams swap ends of the stadium. Can you add this to your game?

Football movement

Can you make any improvements to the way that the football moves around the screen? Sometimes the ball gets stuck or is at a sharp angle and takes a long time to move across the screen. How can you fix this?

Levels

Can you add a second level into the game? This might be:

- two new teams playing
- a higher final score to reach
- adding a time in to dictate part of the game



Congratulations you're a Moonhack changemaker! You can try one of our other projects or try one of the challenges.

Don't forget to talk to an adult about registering your participation and downloading your certificate at moonhack.com

