

Projects

Sprint!

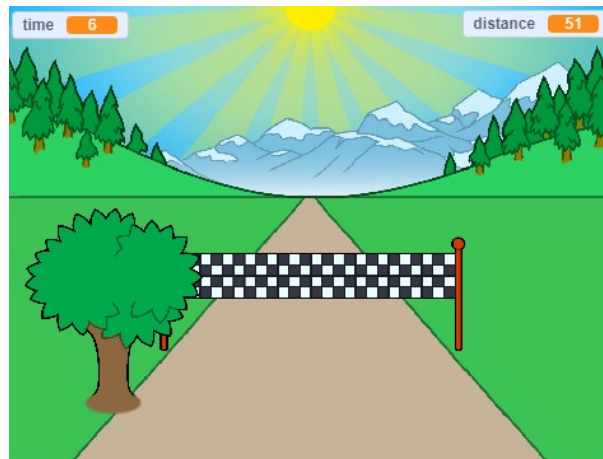
Use the arrow keys to get to the finish line as quickly as you can.

Scratch



Step 1 Introduction

You are going to learn how to create your own sprint game, in which you have to use the left and right arrow keys to get to the finish line as quickly as you can.



What you will need

Hardware

- A computer capable of running Scratch

Software

- Scratch 3 (either **online** (<http://rpf.io/scratchon>) or **offline** (<http://rpf.io/scratchoff>))

Downloads

The starter project can be found **here** (<http://rpf.io/p/en/sprint-go>).

What you will learn

- How to animate sprites
- How to use keyboard input
- How to use broadcasts

Additional information for educators

You can find the **completed project here** (<http://rpf.io/p/en/sprint-get>).

Step 2 On your marks...

Let's start by creating a race countdown.

Open the 'Sprint' Scratch starter project.

Online: open the **starter project** (<http://rpf.io/sprint-on>).

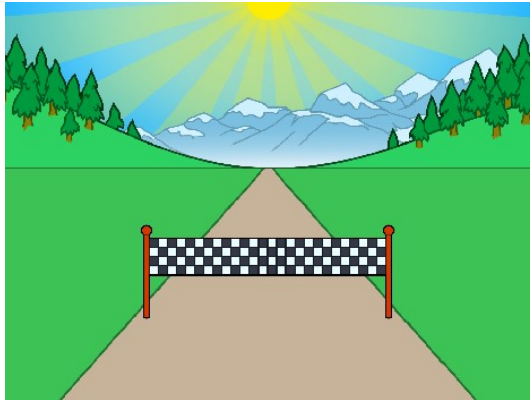
If you have a Scratch account you can make a copy by clicking **Remix**.

Offline: open the **starter project**

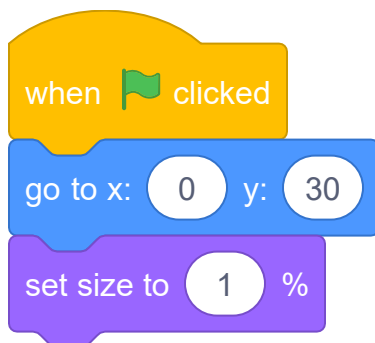
(<http://rpf.io/p/en/sprint-go>) in the offline editor.

If you need to download and install the Scratch offline editor, you can find it at **rpf.io/scratchoff** (<http://rpf.io/scratchoff>).

In the starter project, you should see a road and finish line.

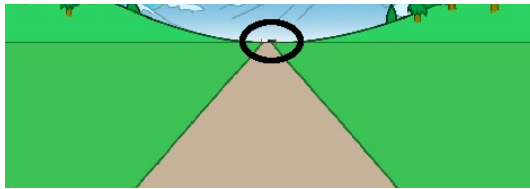


To start with, let's put the finish line on the horizon:

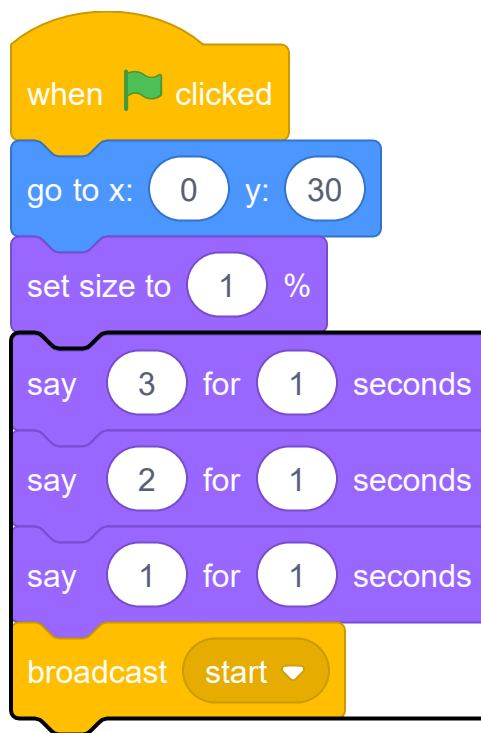


If you click the flag to test your code, you'll see your finish line in the distance.



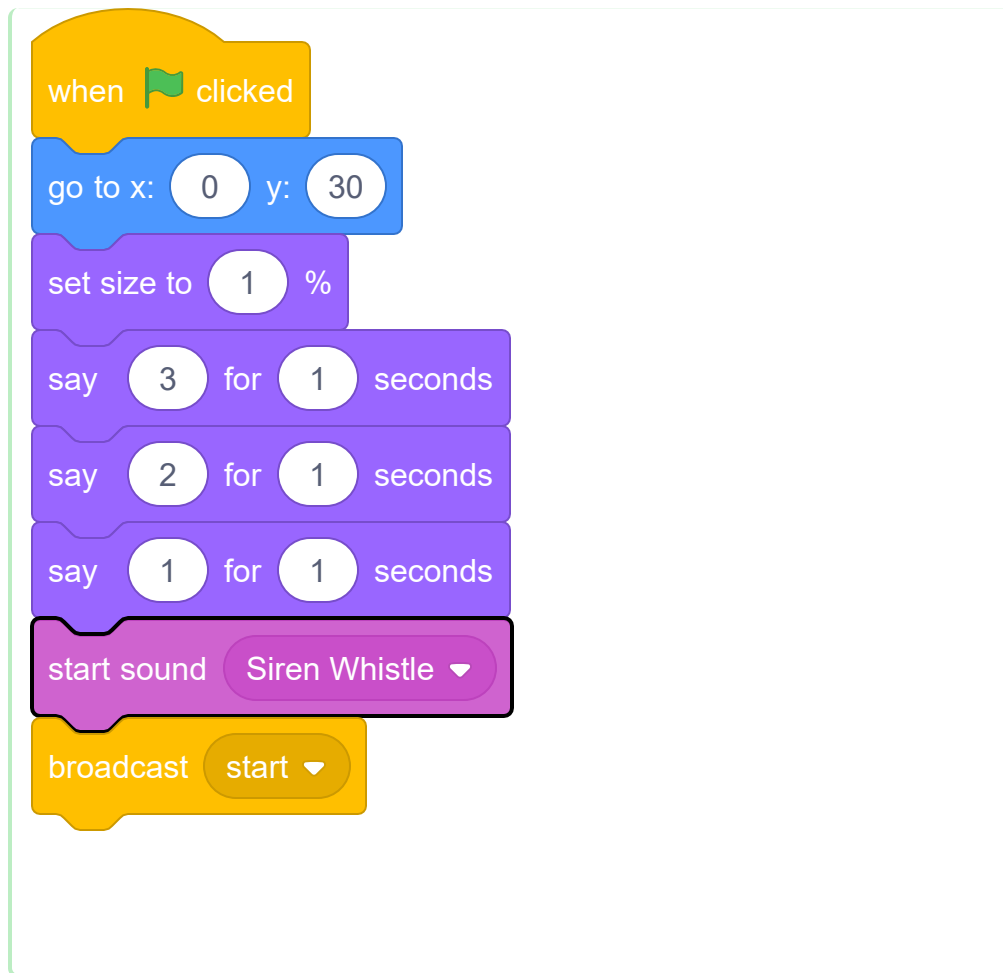


Next, use **say** blocks to create a countdown, and then broadcast a **start** message.



You can also add a sound to your countdown.





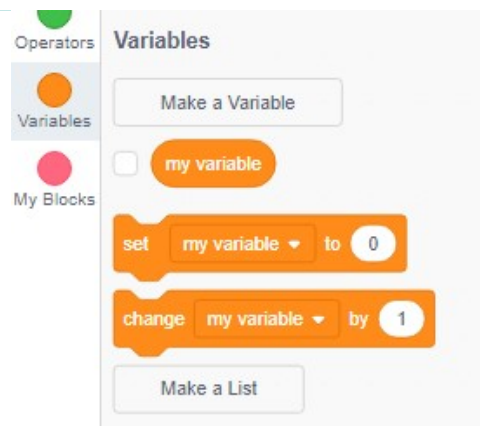
Step 3 Going the distance

Let's move the finish line when the arrow keys are pressed.

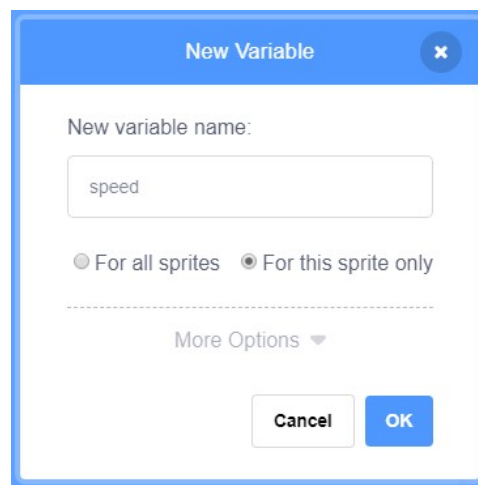
You want to allow the player to press the arrow keys **until they have run 100 meters**. To do this, create a new variable called `distance`.

Add a variable in Scratch

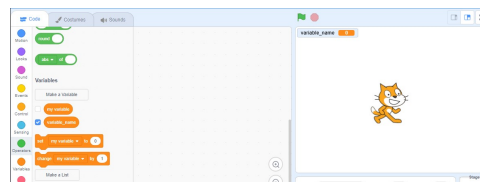
- Click on **Variables** in the Code tab, then click on **Make a Variable**.



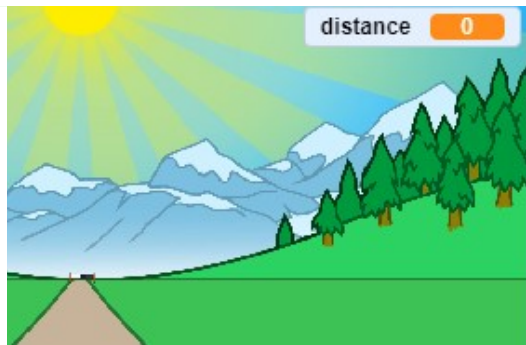
- Type in the name of your variable. You can choose whether you would like your variable to be available to all sprites, or to only this sprite. Press **OK**.



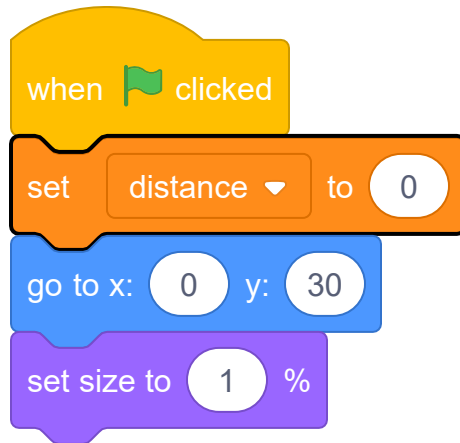
- Once you have created the variable, it will be displayed on the Stage, or you can untick the variable in the Scripts tab to hide it.



You should see your new variable on the stage. Drag it to the top-right corner.

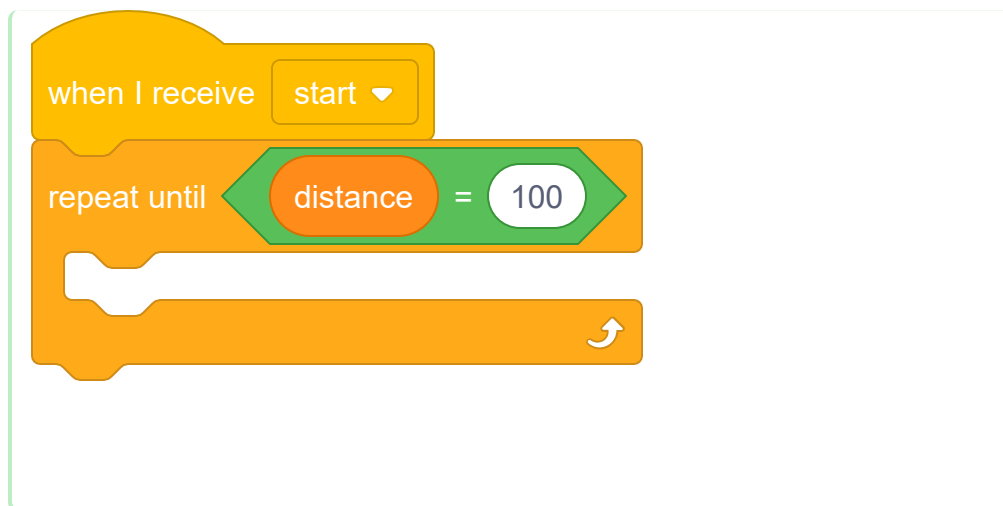


Set the `distance` to 0 when the flag is clicked.

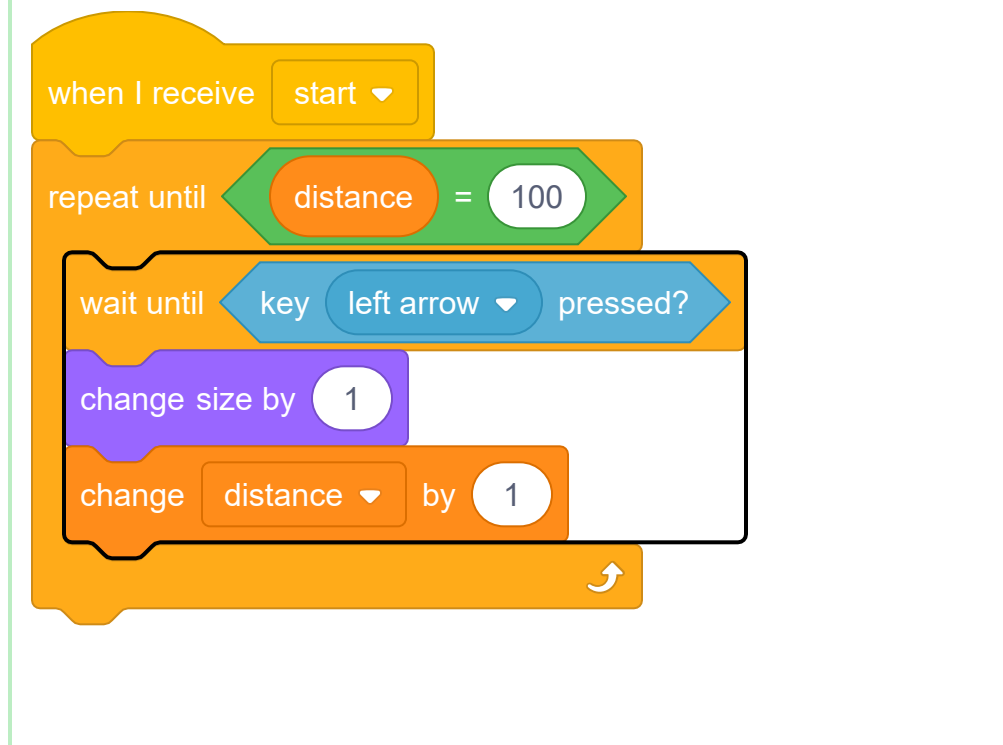


Once your race starts, your player should sprint **until they have run 100 meters**.

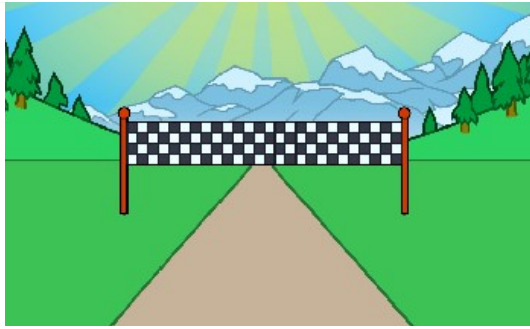




Add code so that your finish line gets a little bigger after the player presses the left arrow key. The distance should also increase.



Click the green flag to test your project. You should see that the finish line gets bigger when the left arrow is pressed, but doesn't move along the track.

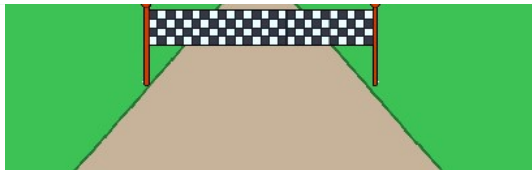


To fix this, you can add code to move the finish line down slightly each time a key is pressed.



Test your project again and you should see the finish line move down the stage towards you.

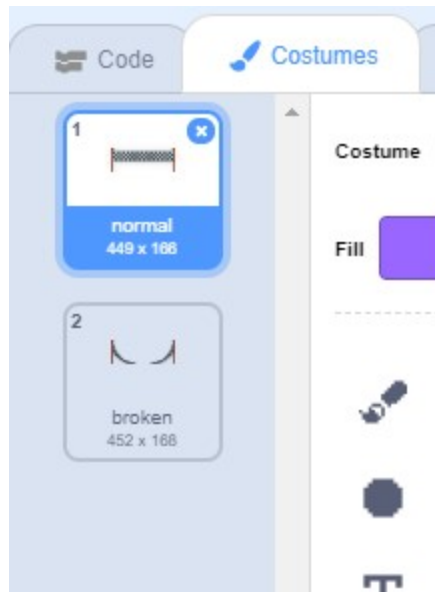




You should then do the same for the right arrow key.



If you click to see the finish line's costumes, you should see that there are 2.



You can switch to the 'broken' costume (and end the game) at the end of the race. Remember to switch to the 'normal' costume at the start of the race!



when I receive start ▼

repeat until distance = 100

wait until key left arrow ▼ pressed?

change size by 1

change y by -1.5

change distance ▼ by 1

wait until key right arrow ▼ pressed?

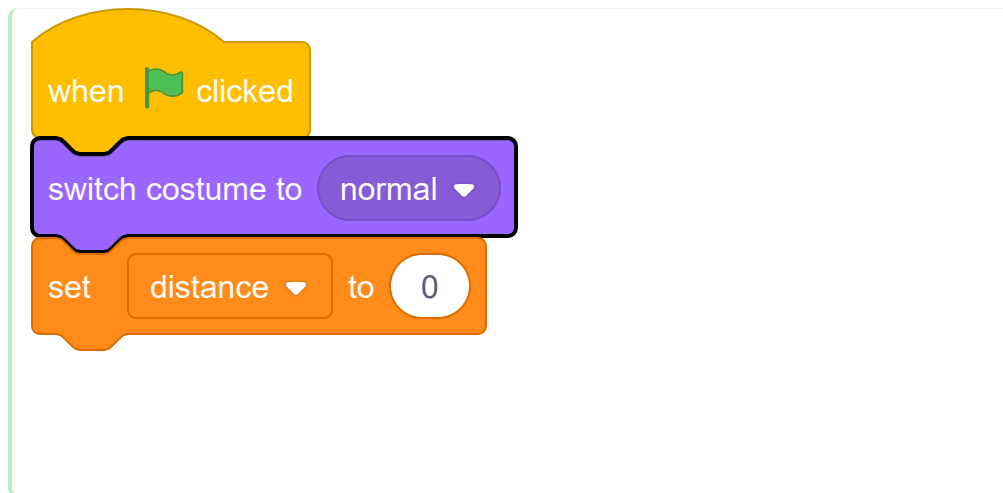
change size by 1

change y by -1.5

change distance ▼ by 1

switch costume to broken ▼

stop all ▼



If you want to play a sound at the end, you'll have to change your `stop all` block to `stop other scripts in sprite`.

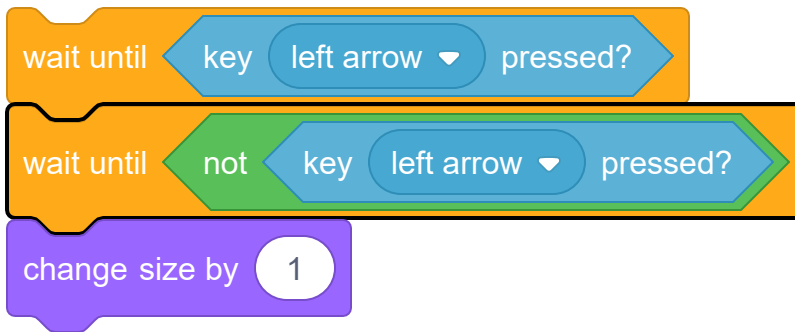
This means that the timer you'll create will stop counting, but the sound will still play.



Have you noticed that you can cheat your game by just holding down the left and right arrow keys?

To fix this, you need to make sure that each key is pressed **and then released** before moving the finish line.

Here's the code you'll need to add:



You'll need to do the same for the right arrow key.



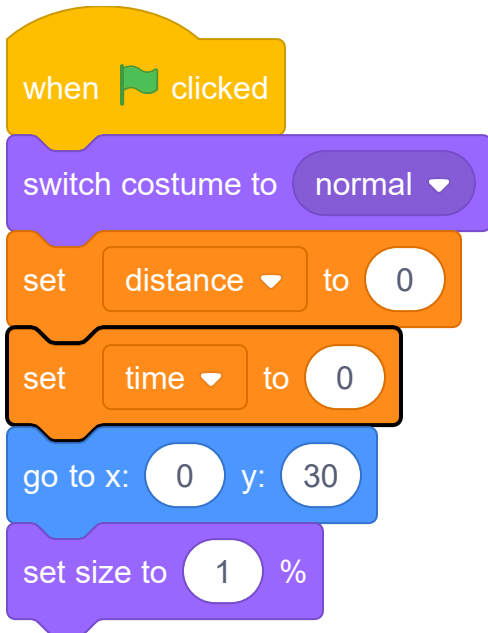
Step 4 Who is the fastest?

Let's add a timer to your game, to see who can sprint the fastest.

Create a new `time` variable. It will appear on the stage. Drag it to the top-left corner.

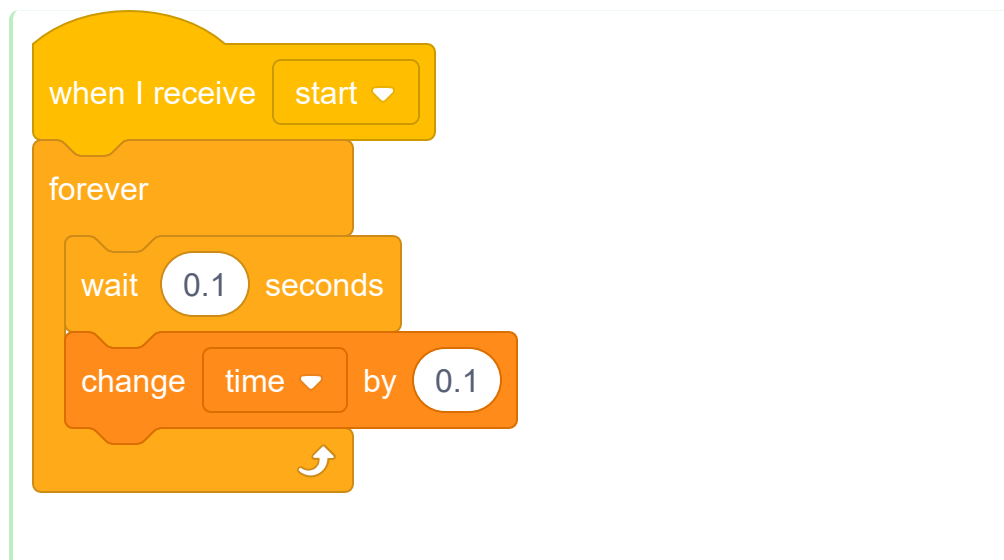


Set the time to 0 at the start of your game.

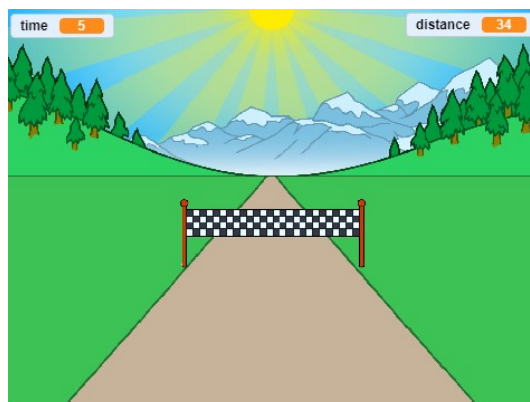


Add this code to make your timer count up when the game starts.





Test your project by clicking the green flag. You should see your timer counts up until you've sprinted 100 meters.

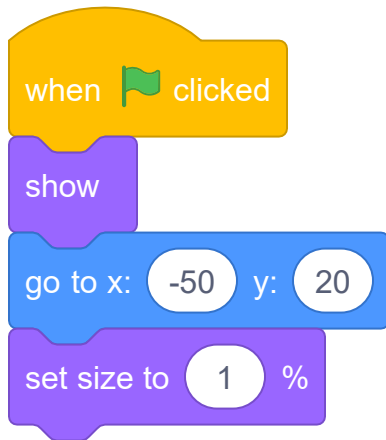


Step 5 Adding scenery

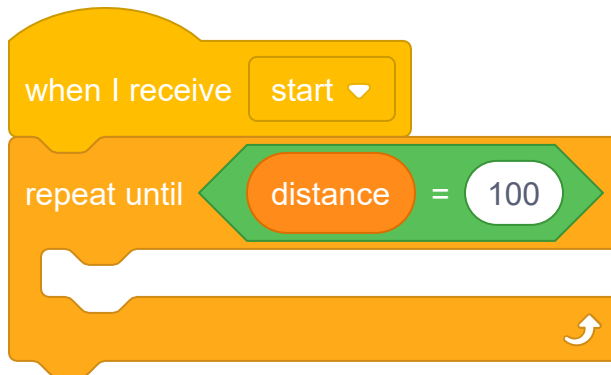
Let's code a tree to move as the player sprints.

First, position the tree and make it small when the flag is clicked.

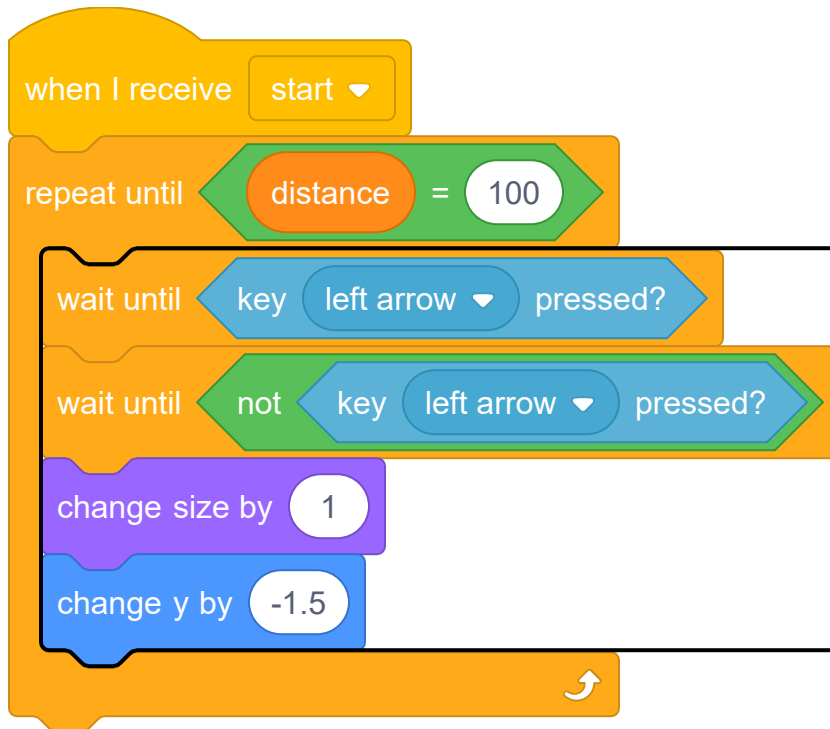




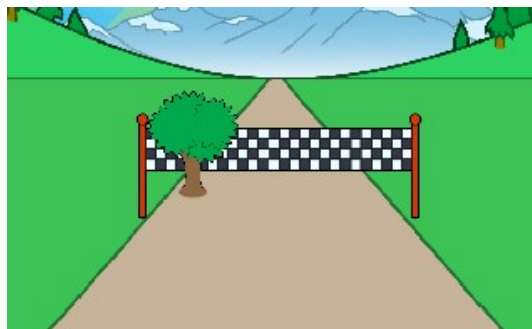
Once the race starts, the tree should move until the player has sprinted 100 meters.



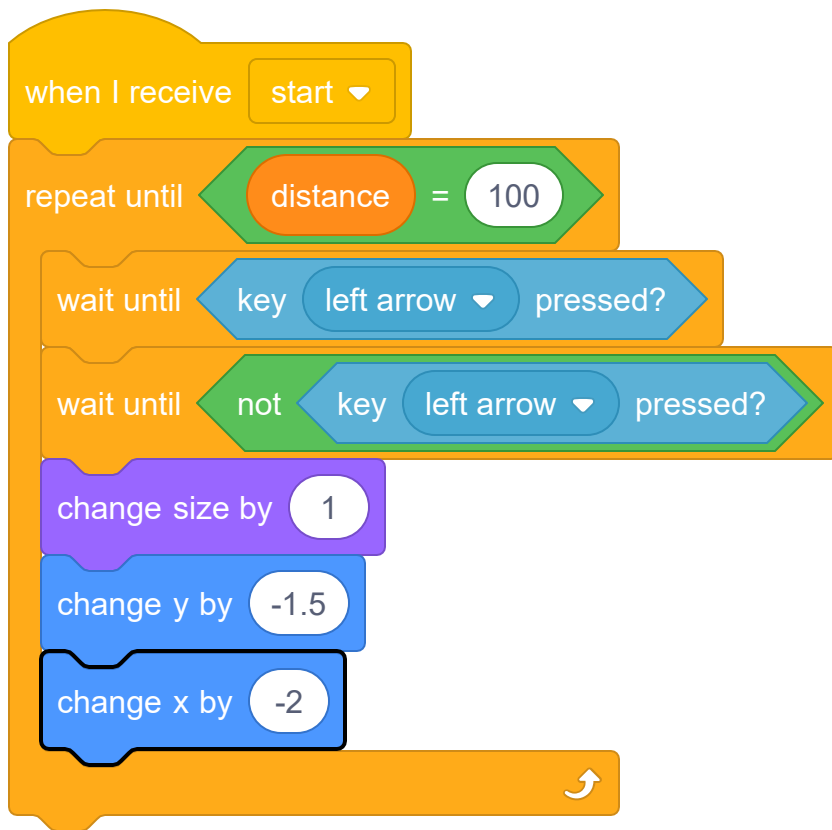
Once the left key has been pressed (and released), the tree should get bigger and move - just like the finish line.



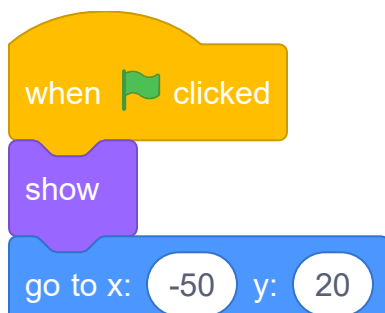
If you test your tree, you'll see that it moves downwards, onto the track.



To fix this, add code to make your tree move away from the track slightly.



You should also do the same for the right arrow key. Here's how your Tree's code should look:



set size to 1 %

when I receive start ▼

repeat until distance = 100

wait until key left arrow ▼ pressed?

wait until not key left arrow ▼ pressed?

change size by 1

change y by -1.5

change x by -2

wait until key right arrow ▼ pressed?

wait until not key right arrow ▼ pressed?

change size by 1

change y by -1.5

change x by -2

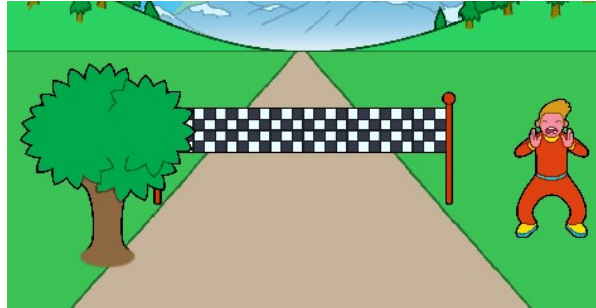


Challenge!

Challenge: Add a spectator

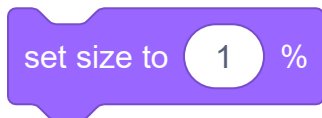
Your project includes a couple of spectator sprites – click the 'show' icon for one to display it on the stage.

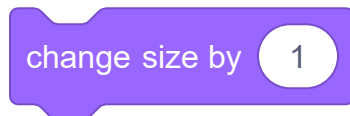
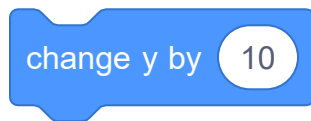
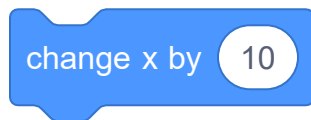
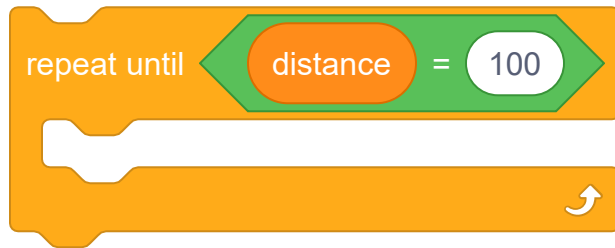
Can you add a spectator to your race? Can you make the spectator cheer when you reach the finish line?



Remember that the code you'll need is very similar to the code you've already added to your finish line and your tree.

Here are some useful code blocks to help you:

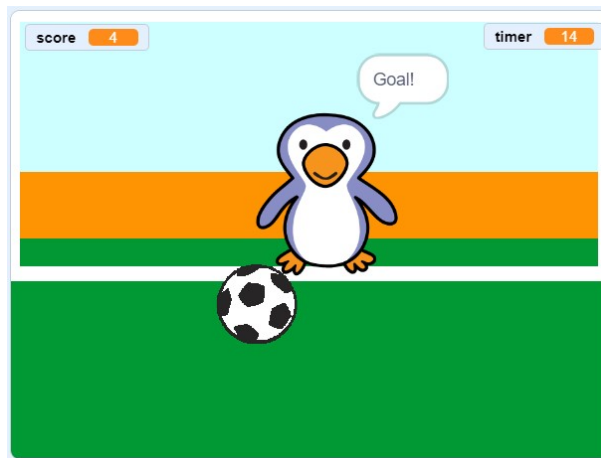




If you prefer, you can add another tree instead, or anything else you like!

Step 6 What next?

Take a look at the **Beat the goalie** <https://projects.raspberrypi.org/en/projects/beat-the-goalie> Scratch project.



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View project & license on GitHub (<https://github.com/RaspberryPiLearning/sprint>)