Scratch Cat goes skiing

Create a skiing game in which you avoid obstacles

Scratch

Step 1 Introduction

You are going to use Scratch to create a skiing game in which you have to avoid randomly appearing obstacles to score points.

What you will make

What you will need

Hardware

- A computer capable of running Scratch

Software

- Scratch 2.0 **offline** (http://rpf.io/scratchoff))

What you will learn

- How to control sprites using the keyboard
- How to draw a backdrop
- How to animate sprites
- Use random numbers

Additional information for educators

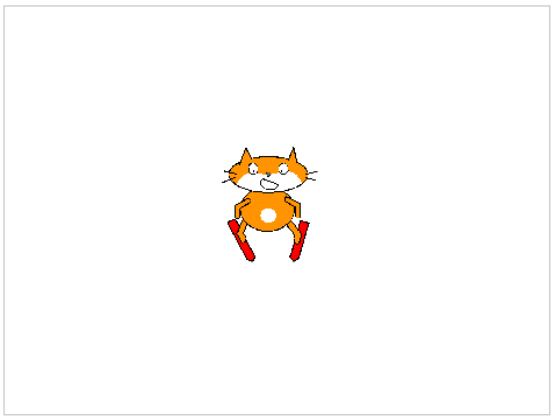
You can **find the solution for this project here** (http://rpf.io/p/en/scratch-cat-goes-skiing-scratch2-get).

Step 2 Getting started

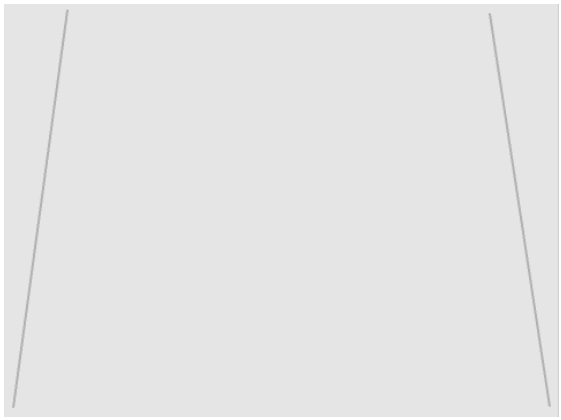
Open the Scratch **starter project** (http://rpf.io/p/en/scratch-cat-goes-skiing-scratch2-go) in the offline editor.

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 blank backdrop and a skier sprite.

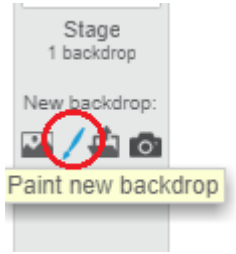


Paint a new backdrop for your ski slope: fill the background grey, and add some straight lines.

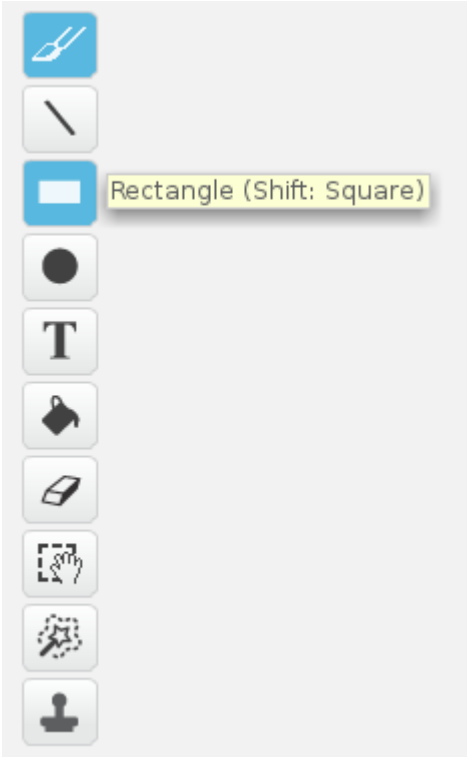


Paint a new Scratch backdrop

- Click on the icon called **Paint new backdrop** to the right of the **Sprites** panel.

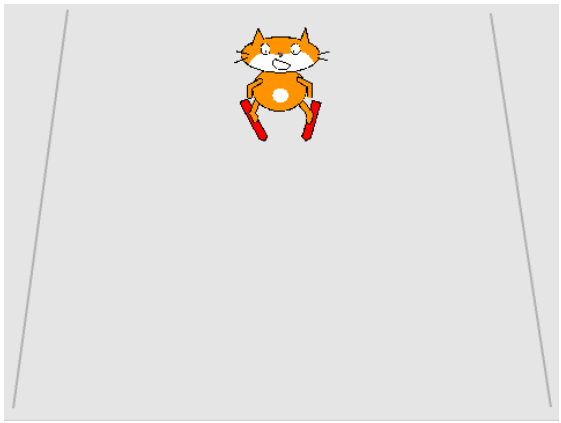


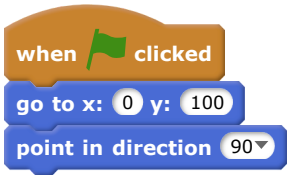
- Use the drawing tool in the Backdrops tab to paint your backdrop.



- When you are finished, don't forget to give your new backdrop a sensible name.

Add code to your skiing cat sprite so that it appears at the top of the slope and faces downhill `when the flag is clicked`.

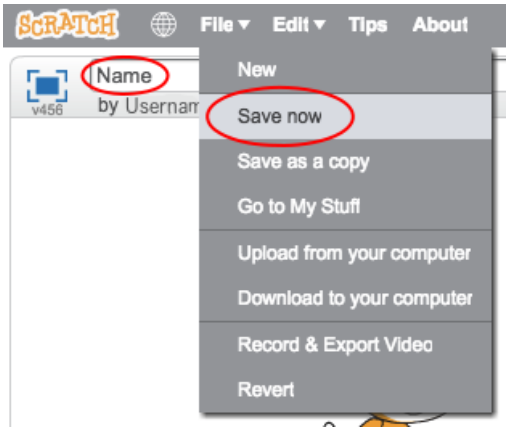




Save and test your project.

Saving a Scratch project

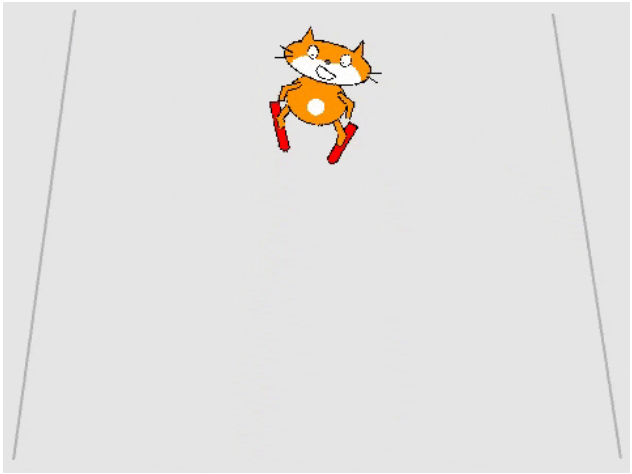
- Give your program a name by typing into the text box in the top-left corner.
- You can click **File** and then **Save now** to save your project.



- **Note:** if you're using Scratch online but don't have a Scratch account, you can save a copy of your project by clicking **Download to your computer** instead.

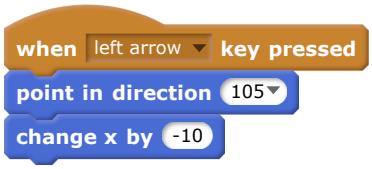
Step 3 Controlling the skier

You will use the left and right arrow keys to control the skier sprite, making it go left and right across the slope.



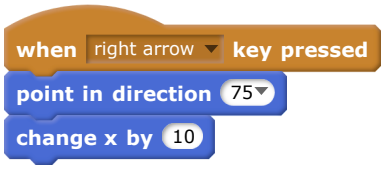
First, make the skier move and point to the left. Your code needs to:

1. Start `when the left arrow key is pressed`
2. Change the angle the sprite is `pointed`
3. Move the sprite to the left by `changing x`



Use blocks similar to the ones above to make the sprite move to the right `when the right arrow key is pressed`.

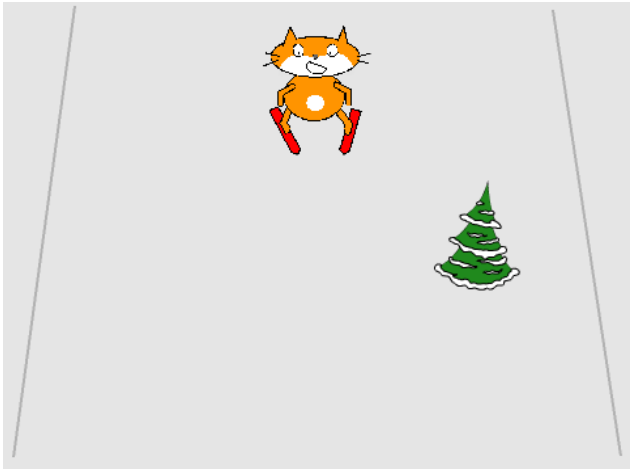
Your code should look like this:



Test your program

Step 4 Adding an obstacle

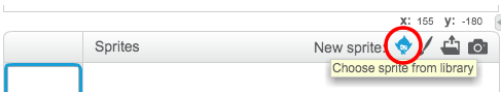
Having obstacles to avoid will make your game more challenging, and making them appear at bottom of the screen and travel upwards will create a sense of movement.



Choose a sprite from the library that will serve as an obstacle — it can be anything you think might be found on a ski slope. Add this new sprite.

Adding a Scratch sprite from the Library

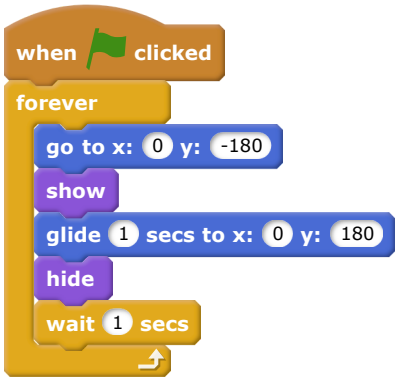
- Click **Choose sprite from library** to see the library of all Scratch sprites.



- You can browse sprites by category, theme, or type. Click on a sprite and click **OK** to add it to your project.

You now need to add code to the sprite to make it move:

1. `Go to` the bottom of the slope and `show`
2. `Glide` up the screen
3. `Hide` when it reaches the top
4. `Wait for 1 second` and then repeat



Challenge!

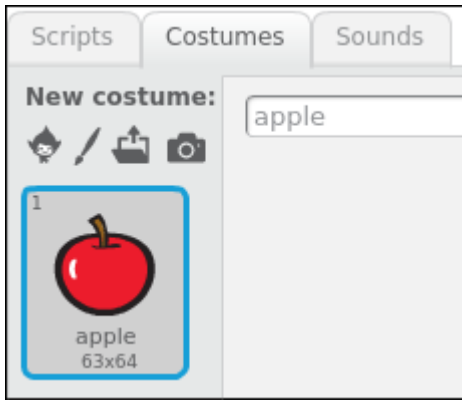
Challenge: change the obstacle's costume

Can you make the obstacle's costume change each time it appears?

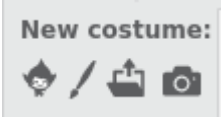
If the sprite you have chosen has only have one costume, you could choose a costume from the library, use another sprite or create your own second costume for the one you already have.

Adding new costumes in Scratch

- With your sprite selected, click on the Costumes tab

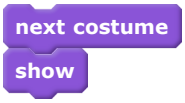


- You can choose one for the four options from the tab. From left to right they are:
  - Choose costume from library
  - Paint new costume
  - Upload costume from file
  - New costume from camera



- To import multiple costumes, you can hold down **Shift** while you are selecting them. Click on **OK** when you are finished.
- If you wish to delete the imported costume, select it and click on the small cross in the top right hand corner.

Add the `next costume` block before the `show`.



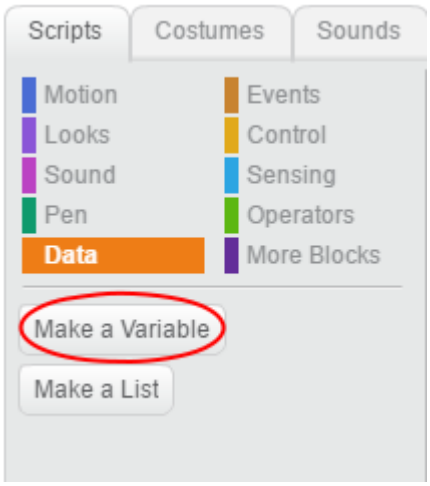
Step 5 Random obstacle

At the moment, the obstacle sprite always appears in the same place on the screen, so it's very easy to avoid. To make the game more challenging, obstacles should appear in a different position every time.

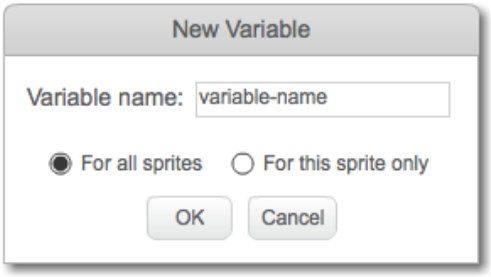
Make a variable called `obstacle_x`.

Add a variable in Scratch

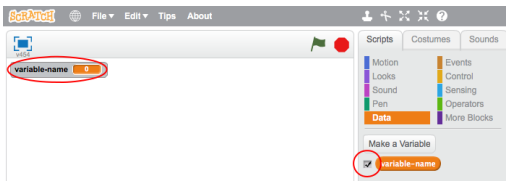
- Click on **Data** in the Scripts tab, then click on **Make a Variable**.



- 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**.

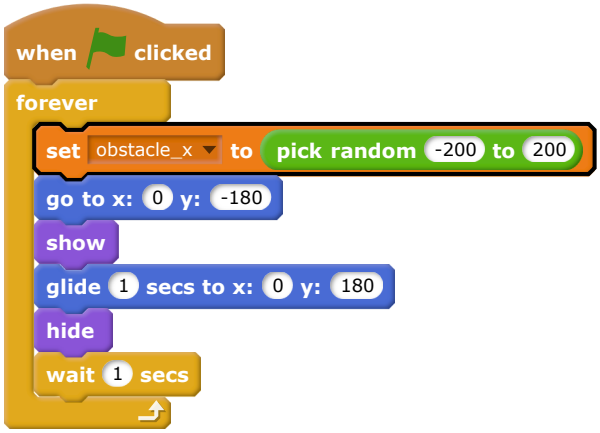


- Once you have created the variable, it will be displayed on the Stage, or you can untick the variable in the Scripts tab to hide it.

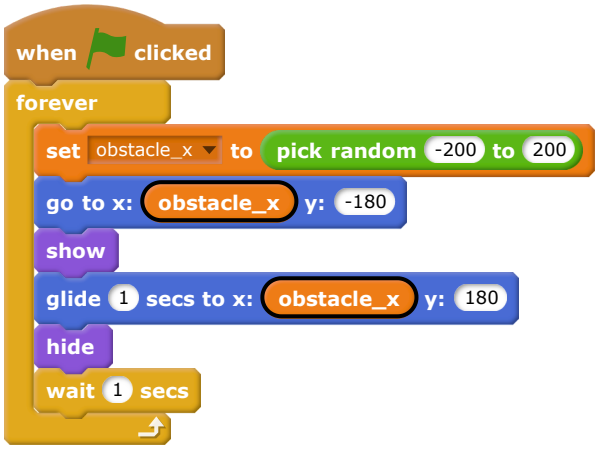


- New blocks will appear and allow you to change the value of the variable.

At the start of the `forever loop`, `set obstacle_x` to a `random number`.



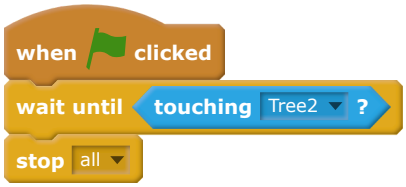
Use the `obstacle_x` variable in the `go to` block and the `glide` block.



Step 6 Crashing

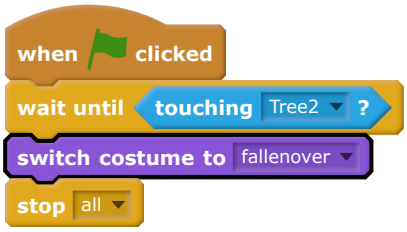
If the skier crashes into an obstacle, it should fall over and the game should end.

Change the code for the skier sprite to `wait until` it is `touching` the obstacle, and to then `stop all`.



When the skier crashes, you should also `switch costume to fallenover`.

The updated code should look like this:



Save and test your code. When the skier hits the obstacle, the costume should change and the game should stop.

However, there is a now problem with your game: the next time you run it, the skier will still be wearing the `fallenover` costume.

Edit the skier's so that their costume changes back to `skiing` when the game starts by `switching the costume to skiing`.

Step 7 Adding a score

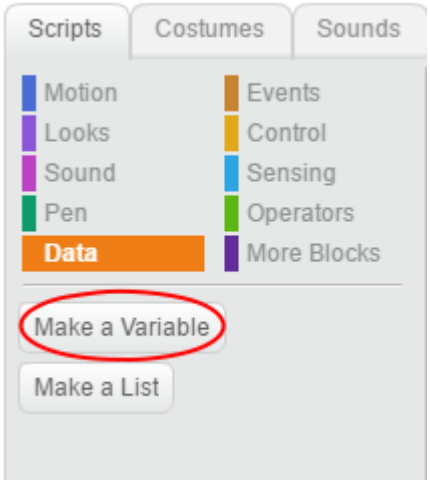
Each time the skier sprite makes it past an obstacle, they should earn points.

`Make a variable` called `score`

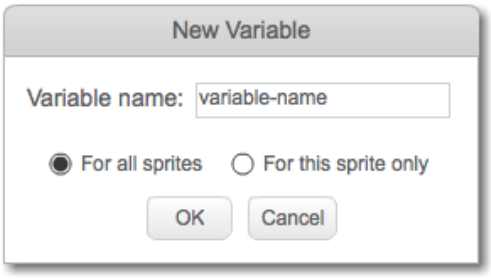
Add a script to the obstacle sprite to set `score` to zero at the start of the game.

Add a variable in Scratch

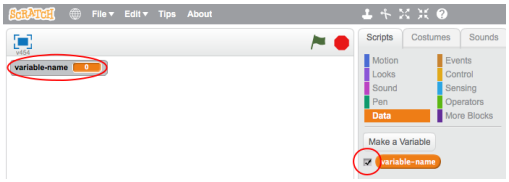
- Click on **Data** in the Scripts tab, then click on **Make a Variable**.



- 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**.



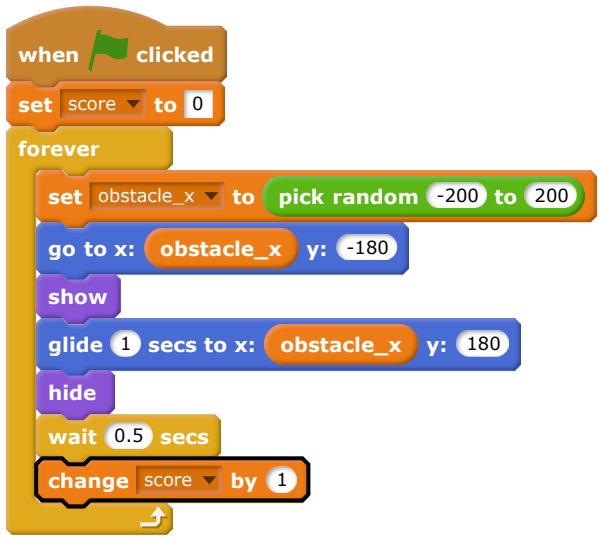
- Once you have created the variable, it will be displayed on the Stage, or you can untick the variable in the Scripts tab to hide it.



- New blocks will appear and allow you to change the value of the variable.

Change the code so that when the obstacle gets to the top of the screen, it `changes score by 1`.

The updated script for the sprite should look like this:



Play the game, see how many points you can score.

Challenge!

Challenge: adding more obstacles

Add more sprites from the library as obstacles to make your game trickier!

When you add a new obstacle, you will need to think about:

1. Which sprite to use
2. What happens when the skier crashes into it
3. Whether to increase the score (and by how much) when the skier makes it past

If you need help, go back to the step in this project where you created the first obstacle.

Step 8 What next?

Take a look at the **Synchronised Swimming** (https://projects.raspberrypi.org/en/projects/synchronised-swimming) Scratch project.

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View project & license on GitHub (https://github.com/RaspberryPiLearning/scratch-cat-goes-skiing-scratch2)