

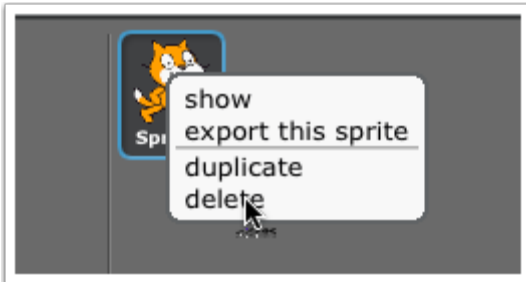
Santa's Cloud Race

We're going to create a game in which Santa has to steer his sleigh around a 'cloud track', at ever-increasing speed. Can you keep his trail within the track?

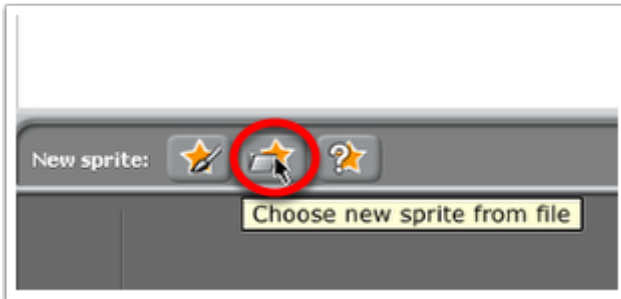


Getting starter: Importing Santa

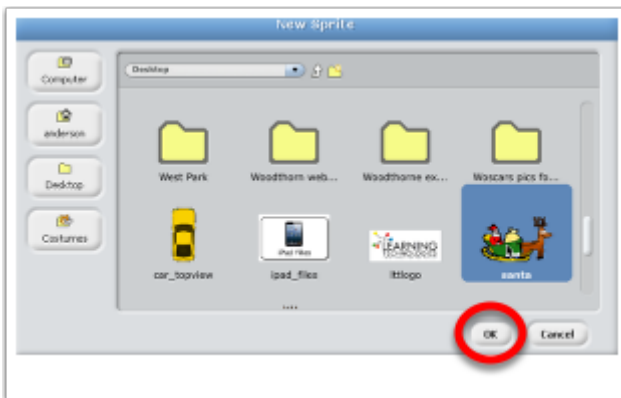
Open Scratch, right-click onto the default cat sprite, and delete it.



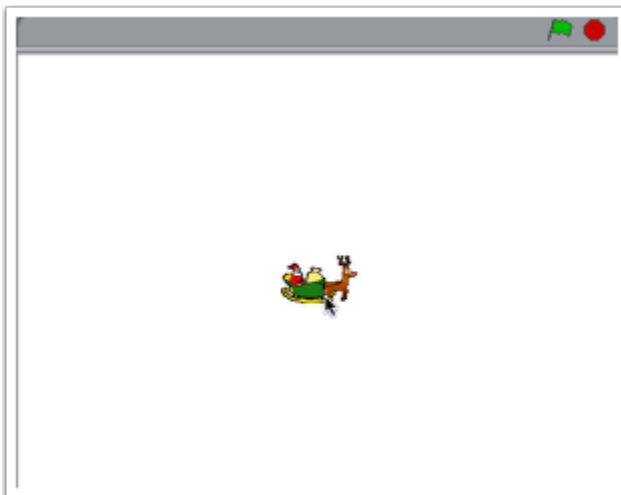
Click on the **Choose new sprite** button ...



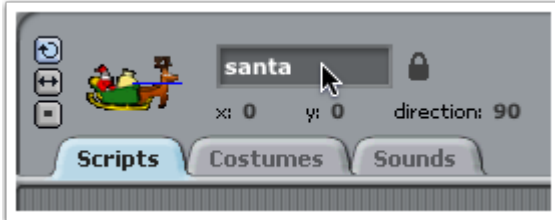
... and browse to the **Santa** image, click onto it to select, then click **OK**.



Santa will appear on the stage.



Click onto the name field for the santa sprite (it will be called **Sprite1** initially) and rename it.

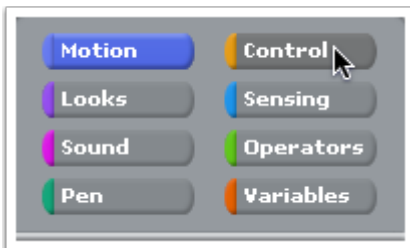


Also click onto the **only face left-right** button. This will limit the rotation of the sprite to prevent it from flipping upside down when facing in come directions.

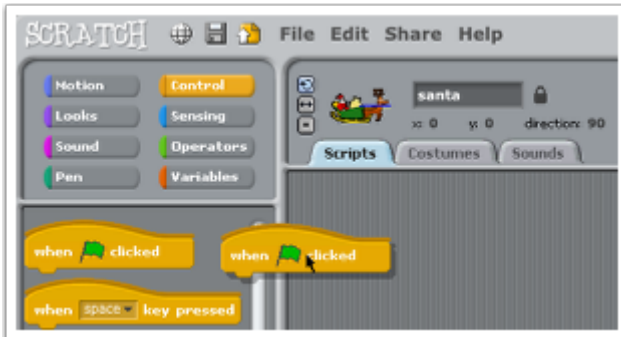


Getting Santa moving

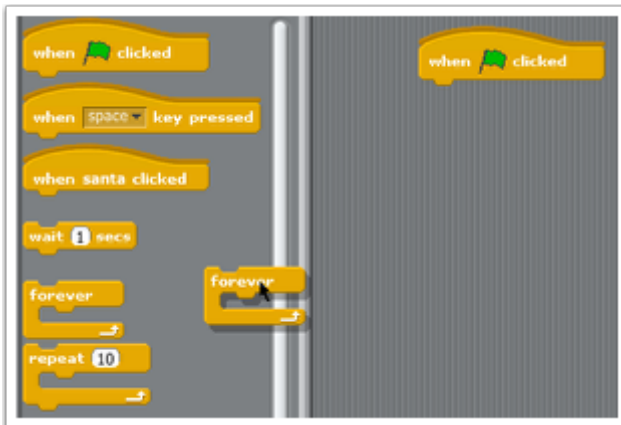
Now it's time to get Santa moving. He will move by following the player's **mouse pointer** around the stage. **Make sure that you have clicked onto the Scripts tab for santa**, then click onto the orange **Control** button.



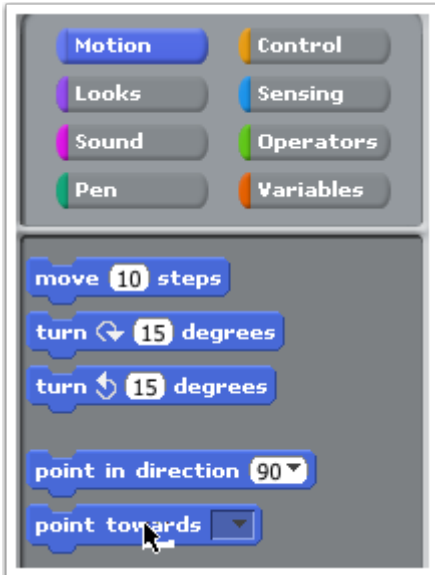
Drag in a **When green flag is clicked** instruction ...



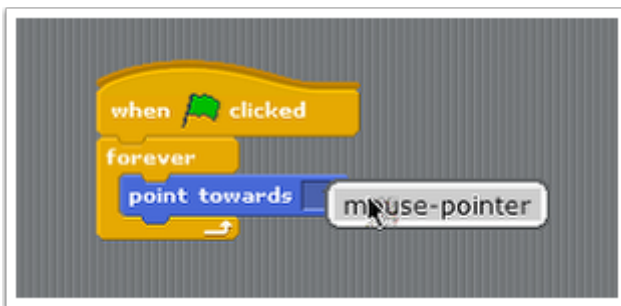
... and a **forever** loop ...



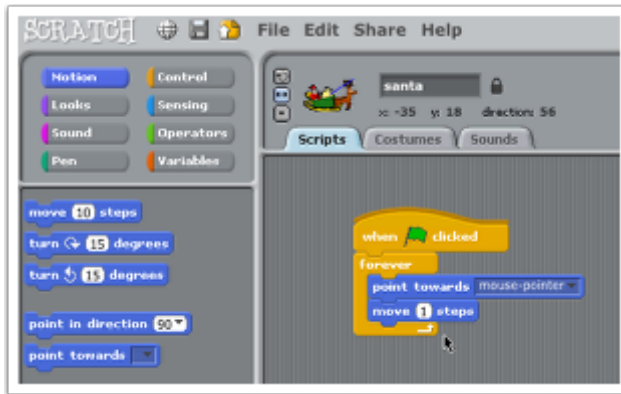
... and then click onto the **Motion** button and drag in a **point towards** instruction.



Arrange the instructions as shown then click onto the drop-down box for the **point towards** command and select **mouse-pointer**. The algorithm now reads 'When the green flag is clicked, continually point Santa at the mouse pointer'.



Finally drag in a 'move 10 steps' command as shown, then edit the number from 10 to **1 step**. The algorithm now reads 'When the green flag is clicked, continually point Santa at the mouse pointer, and move Santa 1 step towards it'.

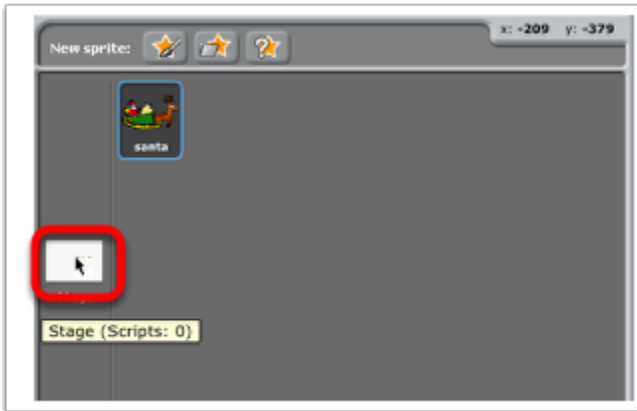


Now test the algorithm. Click onto the green flag and move the mouse pointer around the stage. Santa should follow your pointer.

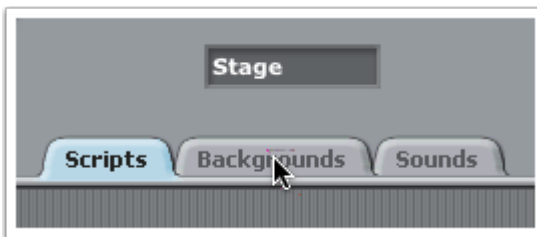


Creating the track

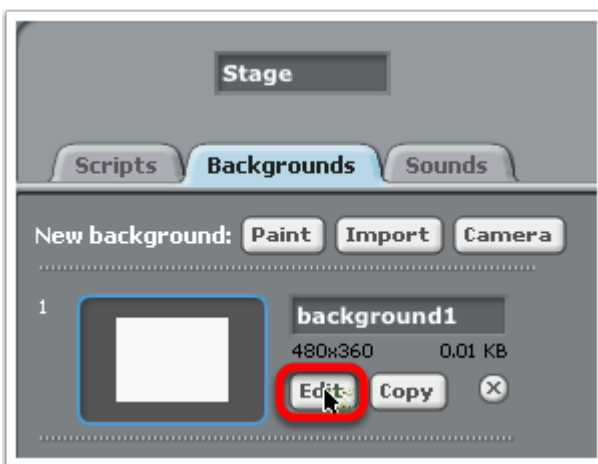
Now we're going to design the background and track. Click onto the **Stage** ...



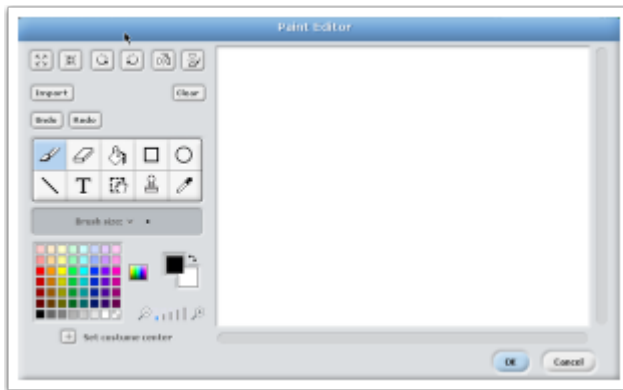
... then click on the **Backgrounds** tab ...



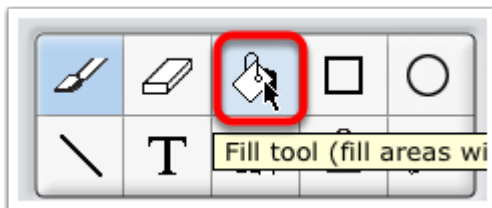
... and click onto the **Edit** button for the background.



An editing window will appear.



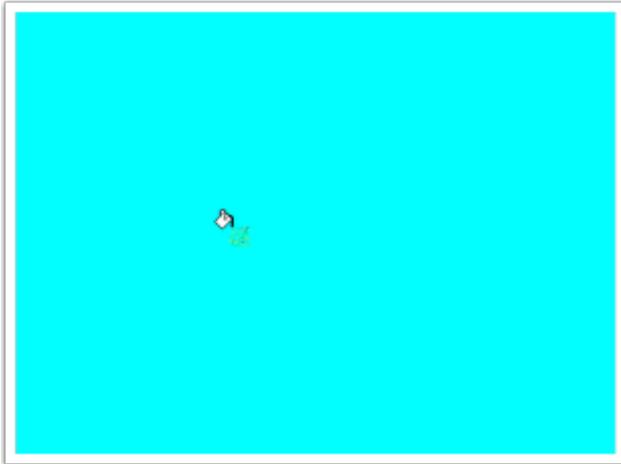
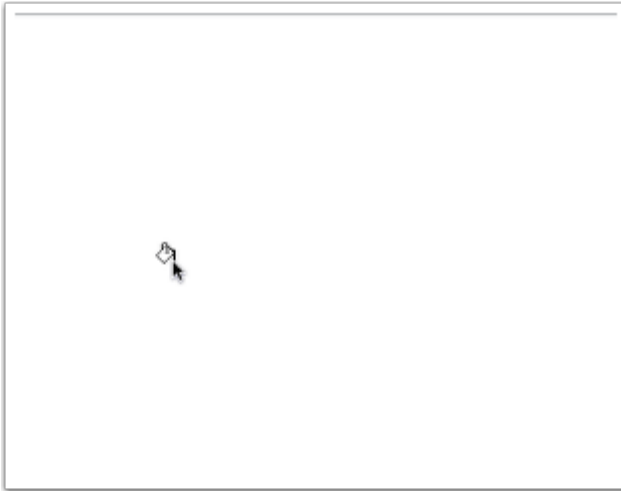
First we are going to fill the background with a sky colour. Select the **Fill tool**.



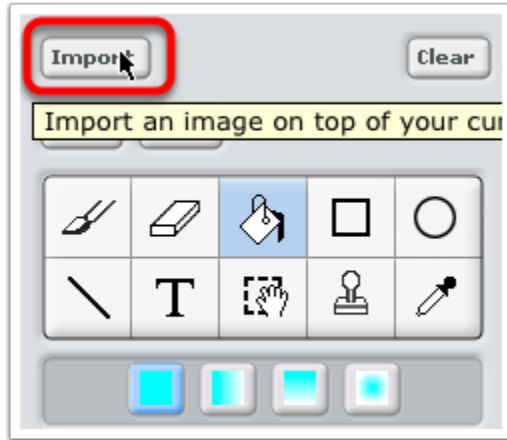
Now select a colour for the background ...



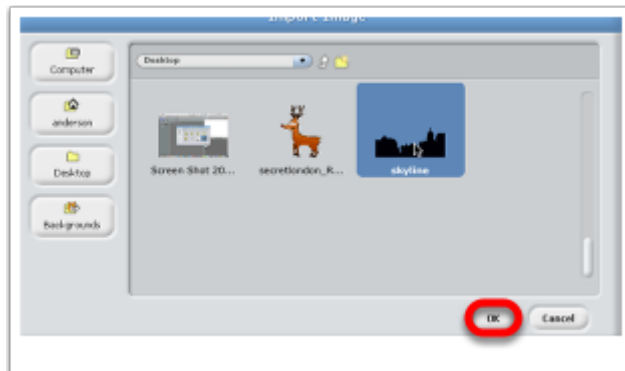
... and click onto the background to fill it with the colour.



Now we are going to import a skyline image onto the stage. Click onto the **Import** button ...



... and browse to the skyline image, click onto and click OK.



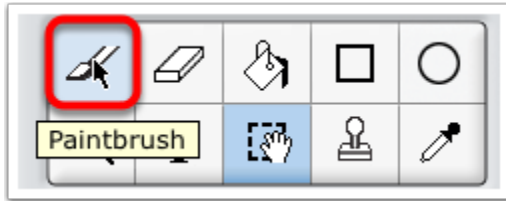
The image will be imported.



Immediately drag the skyline image to the bottom of the editing window, **before clicking away**. If you click away onto another tool, thus 'stamping' the skyline image into the wrong location, click onto the '**Undo**' button and import the image again.



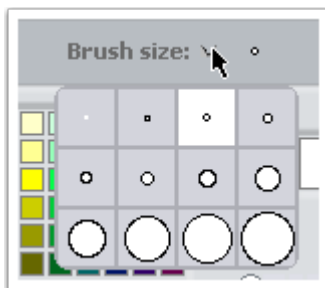
Now we are going to draw the track onto the stage. Select the Paintbrush tool
...



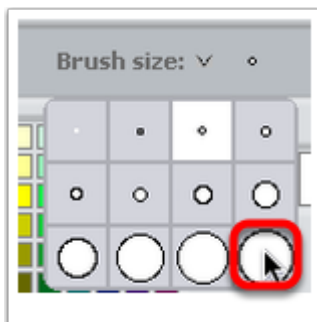
... and click onto a colour for the 'track' - in this case, I've chosen white (with the idea that the track is made of clouds ...)



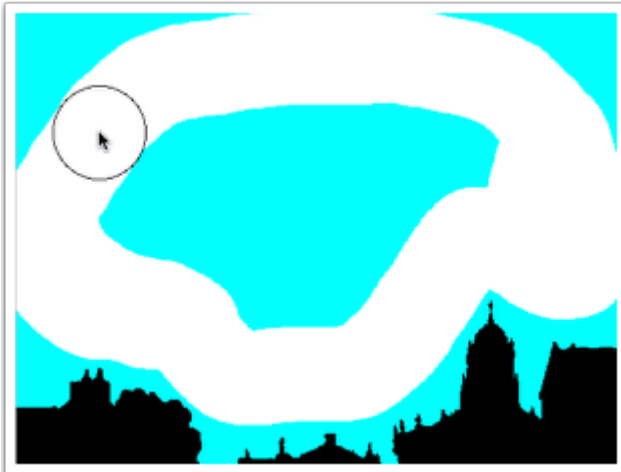
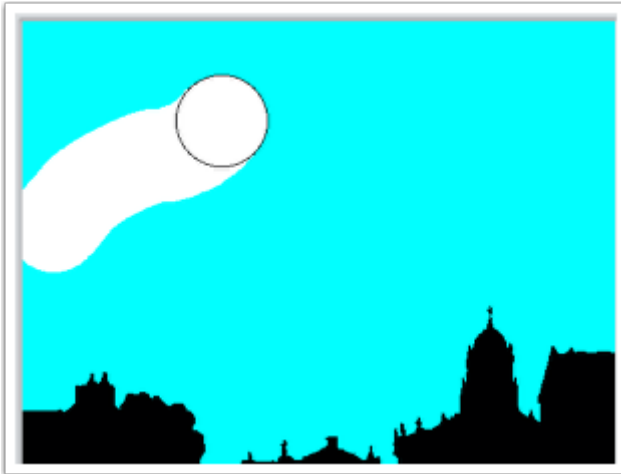
Also click onto the drop-down for the **Brush size** ...



... and select the largest brush size.



Then draw a wide, loop to create a track.



Now drag Santa to an appropriate starting point on the track.



Santa looks a bit big to move him around the track, so we'll shrink him a little. Click onto the **Shrink sprite** button ...



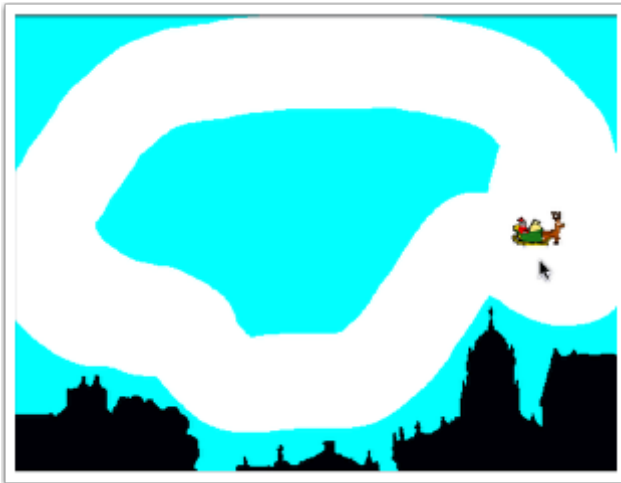
... the click repeatedly onto Santa to shrink him down.



Click on the **green flag** to the top-right of the stage ...



... and see whether you can move Santa around the track safely.



Using the pen tool to mark Santa's path.

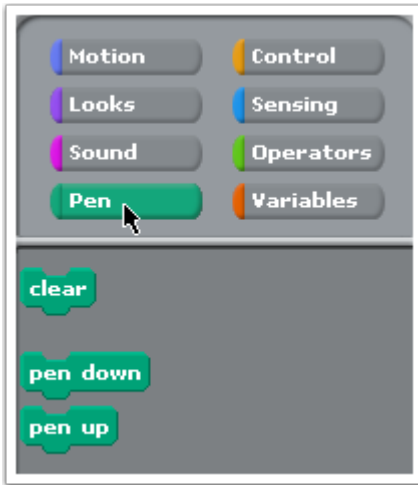
Let's mark Santa's route with the pen tool as he moves around the track. Click onto Santa in the area beneath the stage ...



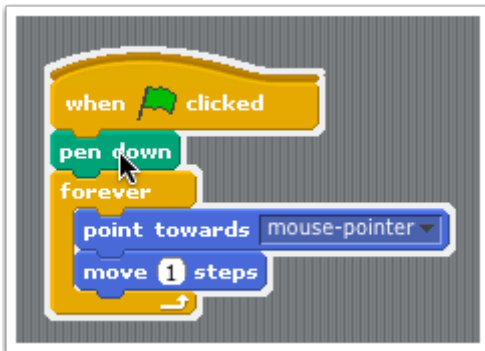
... and select the **Scripts** tab.



Click onto the **Pen** button to reveal instructions related to the pen.



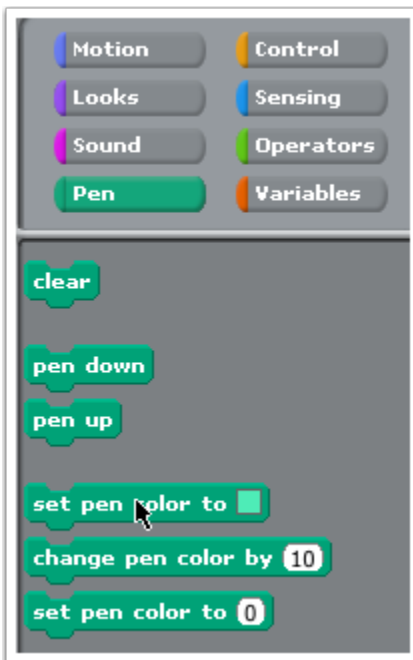
Drag in a **pen down** command into the algorithm we created earlier ...



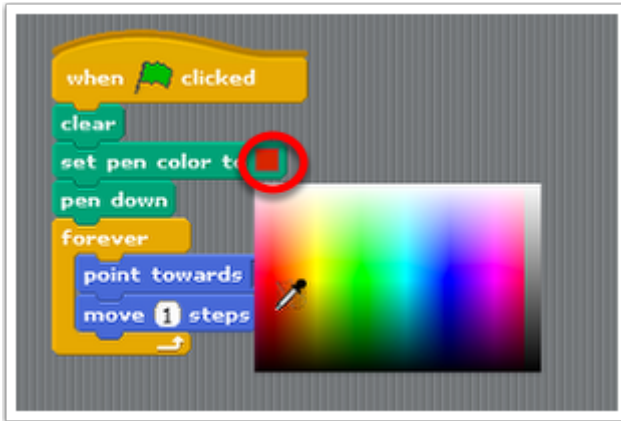
... and click onto the **green flag** to begin the game again. Can you move around the track without the pen line touching the edge of the track?



You'll notice that if you click on the green flag again the pen lines from the previous game remain. We'd also like to change the pen colour. Let's solve these problems.



Drag in a **'set pen color to'** command (then click on the colour to change the colour) and a **clear** command. Arrange the commands as shown. If you begin the game again, you will see that previous pen lines clear now.



Adding a lap count

It would be nice to see how many laps Santa has done. We're going to create a **variable**. A variable is a **named value** that can change its value as a program runs. Click onto the **Variables** button and then onto **the Make a Variable** button.



Let's call the variable **Lap**.



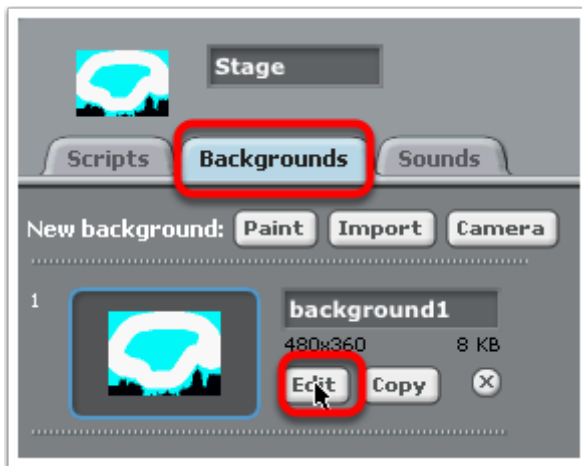
You'll see that a box containing the current value of the Lap variables appears on the stage. Drag that to an appropriate place.



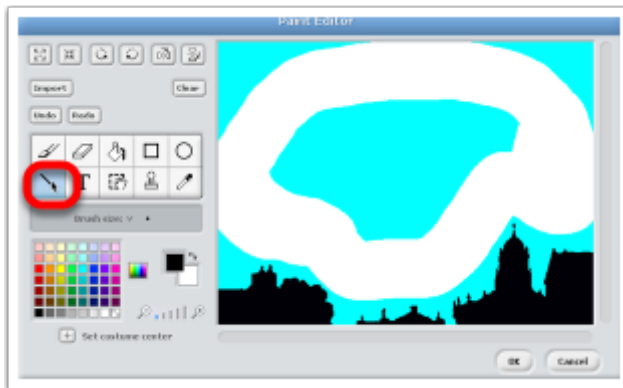
To track the number of laps that Santa has achieved, we need to create a line. When Santa crosses this line, he will begin a new lap. Click onto the **Stage** ...



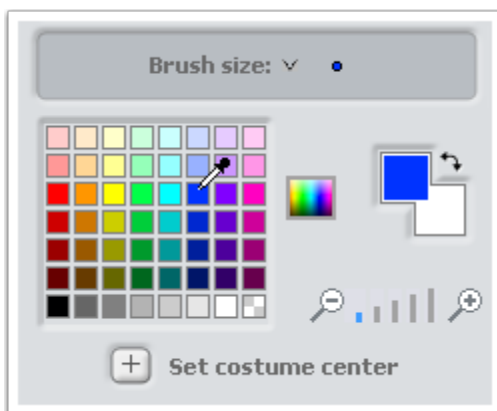
... then onto the **Backgrounds** tab and then **Edit**.



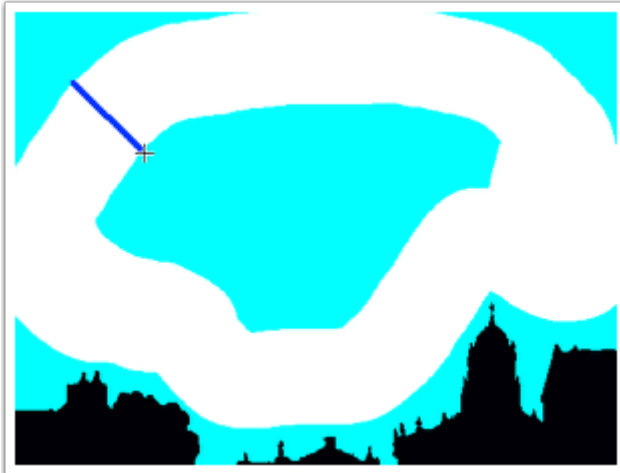
The editing window will open again. Click onto the **line tool** ...



... and select a colour for the line. This **must be a different colour to the background (sky) colour**.

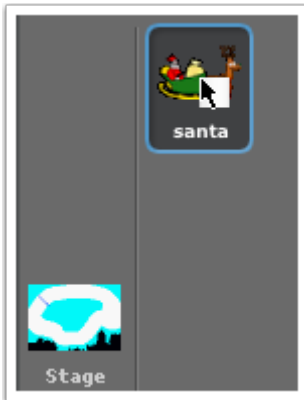


Click and drag to draw a line, as shown, then click **OK** to change the background in the game.



Changing the lap variable

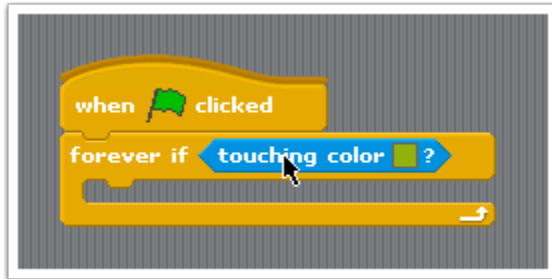
Click onto the **santa** sprite.



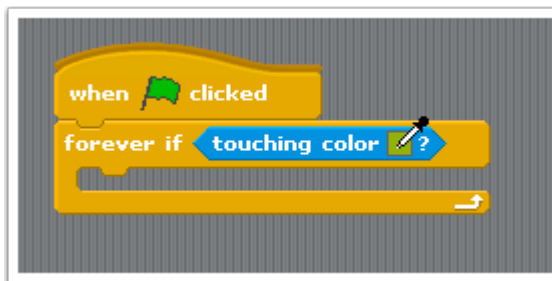
Now click onto the **Control** tab and drag in a **When green flag is clicked** command and **forever if** command. Then click onto the **touching colour** command and drag this in too ...



... before arranging them as shown. This algorithm is going to check to see whether Santa is touching the start line.



We need to change the colour that is being checked to the colour of the line. Click onto the colour block.



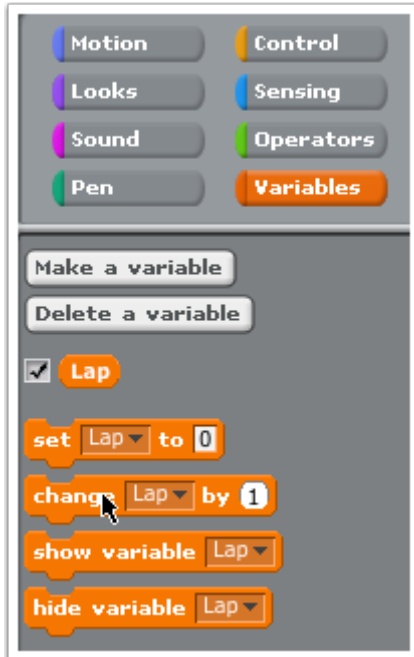
... then click onto the line on the stage to select its colour.



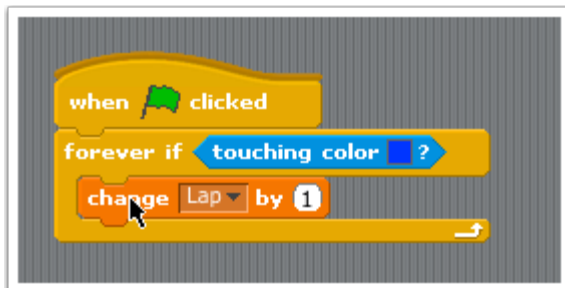
The colour in the **touching color** block should change to be the colour of the line.



Now we are going to tell Scratch what happens when Santa touches the line. Click onto the **Variables** button, and drag in a **change Lap by 1** command.



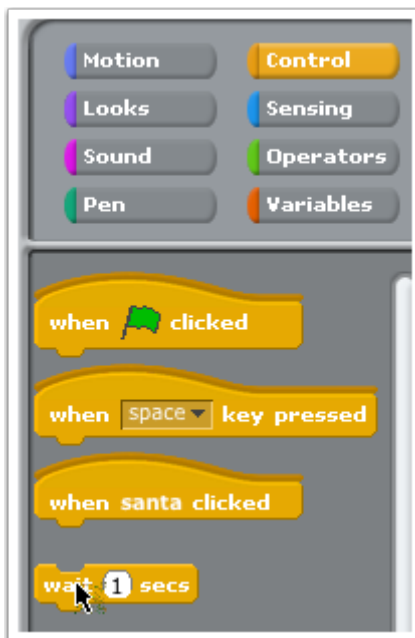
Place it into the algorithm like this. Now when Santa touches the line, the number of laps will increase by 1 ...



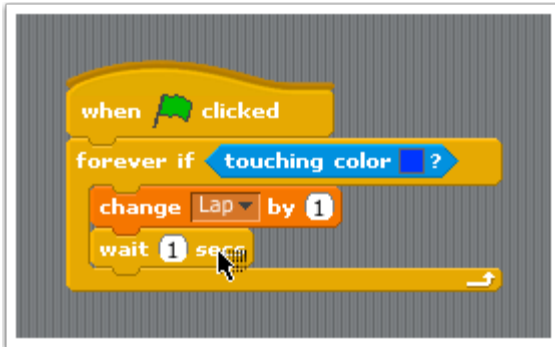
... however, when we test this, we realise there is a problem. When Santa touches the line, the number of laps increases by much more than 1! **Can the children work out why? Can they suggest a possible solution?**



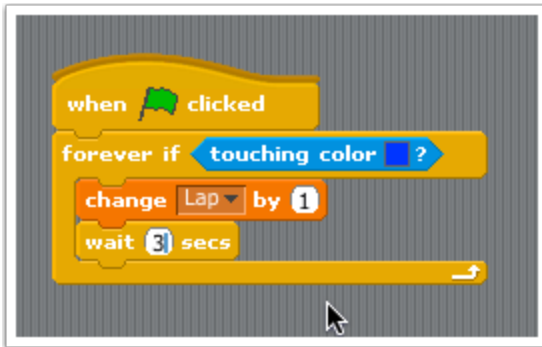
The reason why this happens is that Santa remains in contact with the line for a period of time as he passes over it - during this time, the number of laps will increase repeatedly. Let's solve this problem. Click onto the **Control** button, and drag in a **wait** command.



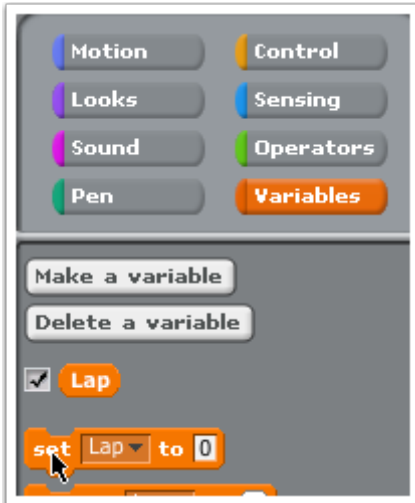
Drag it in as shown ...



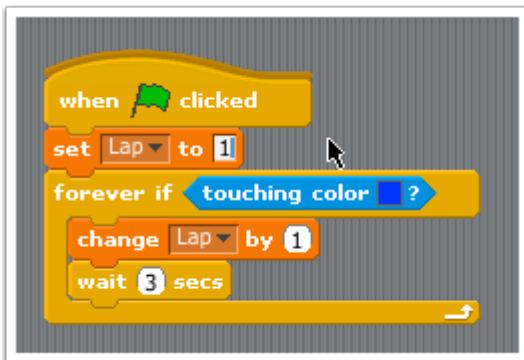
... and change the time for the wait to 3 seconds. Now, when Santa hits the line, the number of laps will increase by one, but there will then be a 3 second wait before Scratch checks again to see whether he is touching the line. During that time, he has passed over the line.



Let's make sure that the number of laps is reset every time the game is started.
Drag in a **set Lap to** command ...

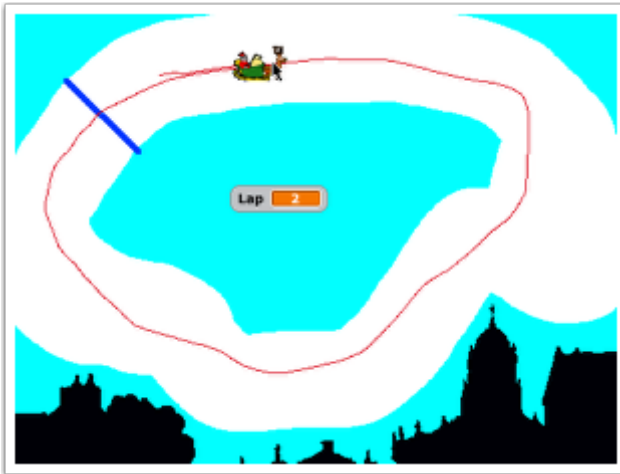


... drop it in place as shown, and change the **set lap** to 1.



Adding challenge

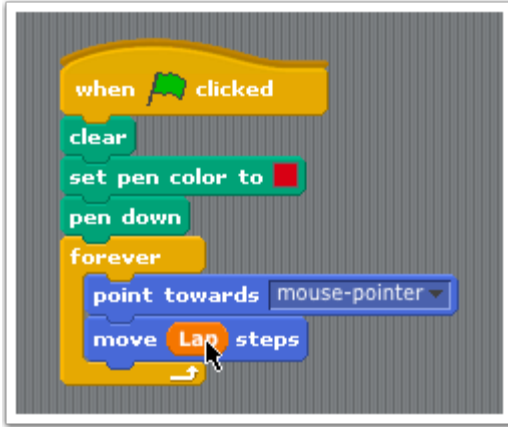
We can play the game now, but you can probably keep the pen lines within the track quite easily. Let's add some challenge. We're going to make Santa move more quickly with every lap.



Click onto the **Variables** button, and drag in the **lap variable** ...



... and replace the number of steps that Santa moves with this variable. Now as Santa laps the track, his speed will increase every time!



Play the game

Play the game. How many laps can you do without the line striking the edge of the track?

