

If you are new to Scratch 3.0, pick up a copy of the [Scratch Basics Sheet](#) to help with the screen layout

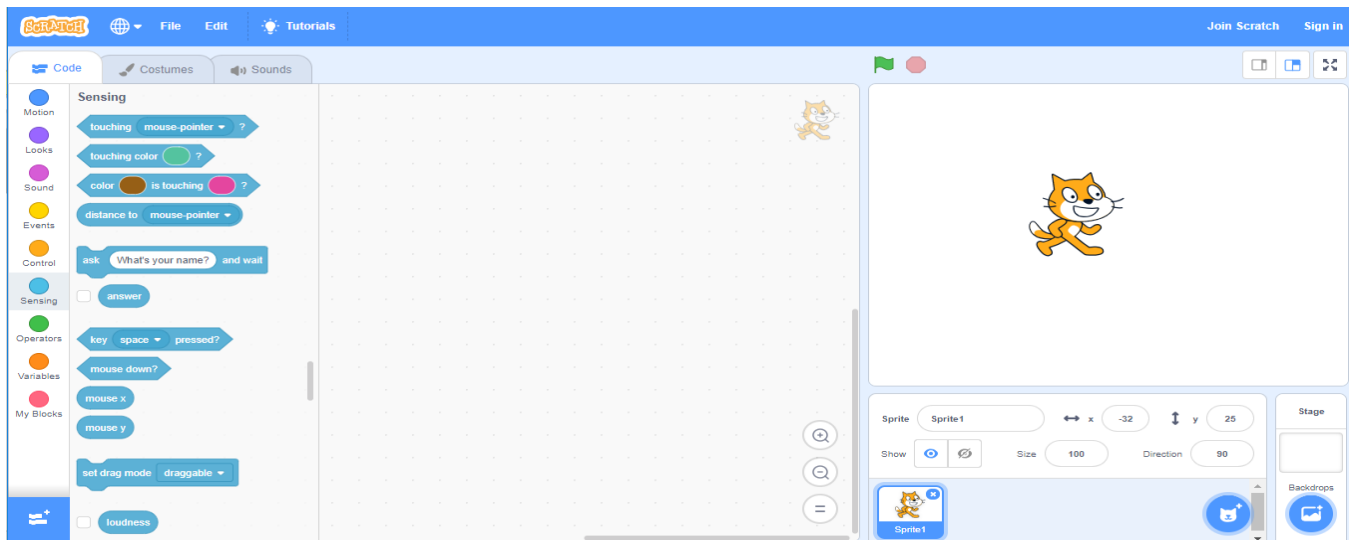
Start Your Project

1 Open up scratch.

For today's project we are going to use the cat sprite

Before we do anything, let's check everything is in the right place

- Click on the Code tab in the top left of the screen
 - Make sure the mini cat Sprite has a blue highlight around it. This shows which sprite you are coding – really useful when you have more than one sprite. It should look something like this



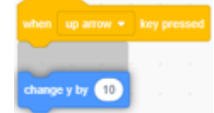
2 Let's start by making the cat move.

- Click on the yellow *Events* button in the top left corner. This takes you to all of the events commands you can use - or you can just scroll the long list to find the Events blocks
- Find the one that says '*when space key pressed*'. Pick it up and drag it to the middle area.
 - Repeat until you have four of them.
- Click on the little white arrow next to each word 'space'.
 - Change each of them, so one says 'up arrow', one says 'down arrow', one of them says 'left arrow' and one of them 'right arrow'. Your page should look something like this:

3 Now let's tell the cat what to do when those buttons are pressed.

- In the *Motion* section find the command that says '*change y by 10*'. Put one of these on 'up' key and one on the down key.
- You will also need '*change x by 10*'. Stick two of these to 'left' and 'right'
- Change all of the numbers by clicking on the *10* and type in 2

Did you know? ...When you hold a new block just under an existing command, you will see a shadow. When you see this and you drop the new command, they stick – Just like Lego!!



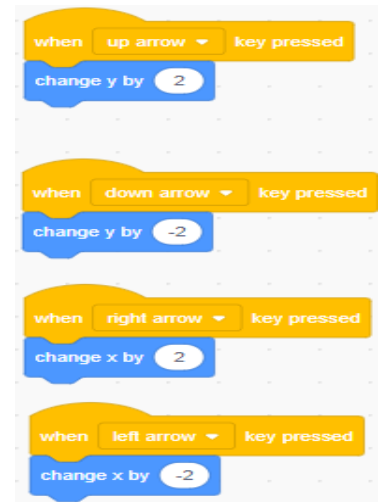
4 Test the program by clicking the green flag in the top right-hand corner. Does it work right? Use the arrow keys on your keyboard to move round. Hmmmm – not quite right. The cat only moves up and right.

Try this –

- Change the number on the left button by clicking on the '2' in that box and type in '-2'. That should make him go in the right direction.
- Now do the same for down.

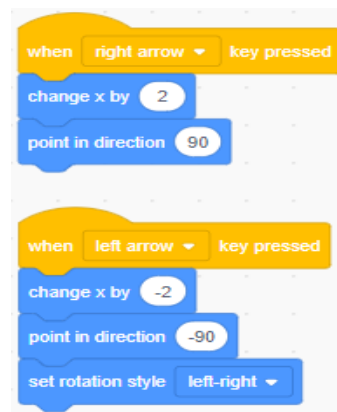
Test it again. Is that better?

Your code should look like this now, and your cat should be moving all over the screen.

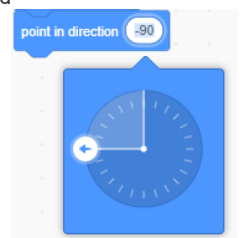


5 Starting to look better, but he flips upside down. Let's fix that bit.

- From *Motion* add on these two extra blocks 'point in direction 90' to the existing left and right keys but change the left one to '-90'.
- Now from the *Motion* section add in the "set rotation style" block and make sure the "left-right" option is selected
- These two sections should now look something like this



Did you know? ...When you click on the number of the point in direction block, you also get a circle and you can drag the arrow symbol to the direction you want



Save your project so you don't lose all of your hard work. If you're not sure how to do this, refer to the [Scratch 3.0 Basics](#) sheet

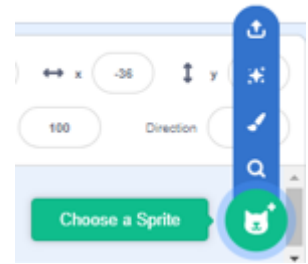
Time to test your code.

- ✓ Is everything working as you would expect
- ✓ Play with the number – what happens?
- ✓ What happens if you change some of the drop-down values?
- ✓ Don't forget to put the values back so I know where you are up to 😊

Let's Get Some Food

6 Let's give our cat something to go and get. How about food?

- Add a new sprite by clicking on the *Choose a Sprite* button.
 - We are going to use one from the Scratch library so click on the cat head with the +
- You can scroll through all of the sprites, or you can click on the groups at the top to narrow your search – Maybe “Food”
- Pick the food your cat will be hunting for. My cat loves bananas so I picked these but your cat may like cheesy-puffs better – it's your game.

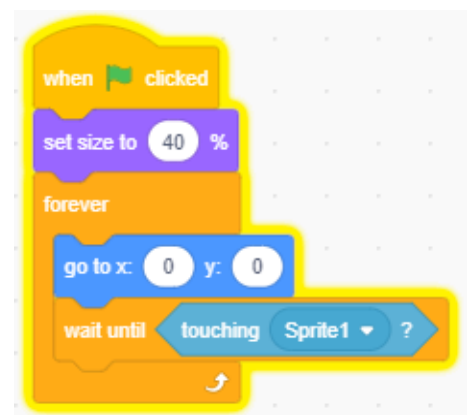


7 Now we need some code to make the food show up, make it the right size and allow the cat to eat it up. First make sure the new sprite you have just selected has the blue highlight around it.

Now find the following blocks

- From *Events* find the “when (green flag) clicked”
- From *Looks* find the “set size to %” block, and change to 40%
- From *Control* find the “forever” loop
- From *Motion* find the “go to x: y: ” block. Change both numbers to 0 (zero)
 - From *Control* find the “wait until” block. Now from *Sensing* find the “touching ” block. Add this to the space inside the “wait until” block.
 - Now click on the white arrow and change mouse-pointer to Sprite1

Your code should look something like this



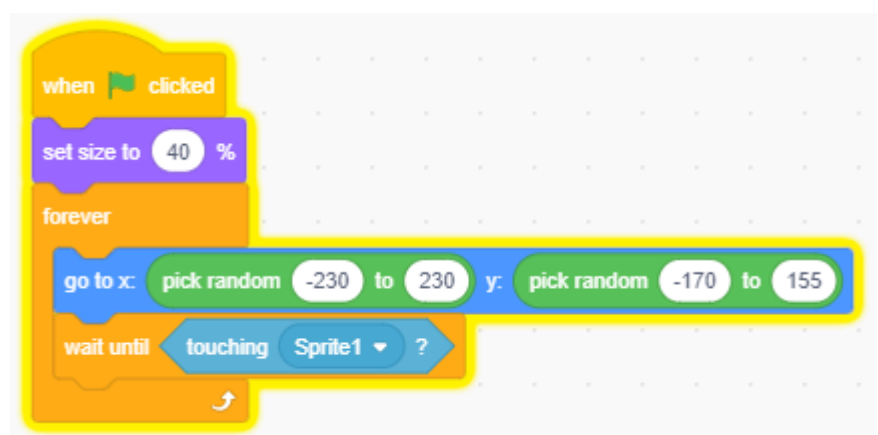
8 Let's make it a little harder by moving the food around each time you get to it.

- From *Operators* pick up two 'pick random' commands.
 - These pick a random number – a bit like rolling a dice.
- Add the top one to replace the '0' next to the x and then pick up the other one and drop it on the '0' next to the y.
 - The area round the '0' glows white when you have it in the right place and you can drop.

Change the numbers to the ones shown here

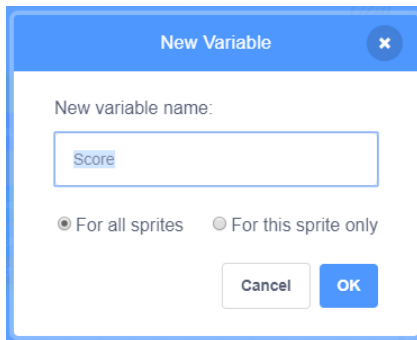
Your code should now look like this

There is a page in the [Scratch 3.0 Basics](#) sheet which tells you all about the x and y coordinates and how they work



9 We need one more thing for our food. We need a reason to go and get it. The cat will probably want to go and grab the food anyway, but for the game let's add a score.

We do this in the Variables area. This menu is a little different to



what we have been used to.

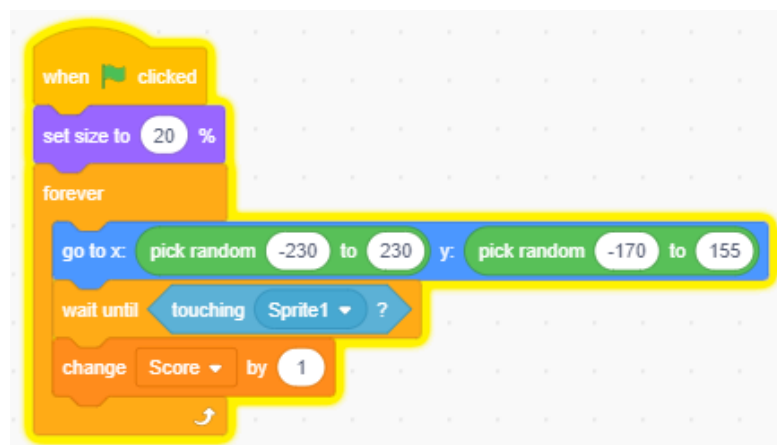
- Click on “make a variable” box, and the blue box pops up.
- Let’s call it “Score. Make sure the dot is in place “For all sprites” and click OK

Did you know? ...A variable is a bit of code which changes based on a set of conditions.

So as an example, like keeping score in a game. The score (code) changes when a baddie is hit (condition). If you don't hit a baddie, you don't get the point !

- Underneath this box in the *Variables* section are some more familiar block.
- Find the “change by” block and add it to your code.
- Change “my variable” to “Score” and change the number to 1

Your code should now look like this:



Time to save

And now time to test

- ✓ Is everything working as you would expect
- ✓ Play with the number – what happens?
- ✓ What happens if you change some of the drop-down values?
- ✓ Don't forget to put the values back so I know where you are up to 😊

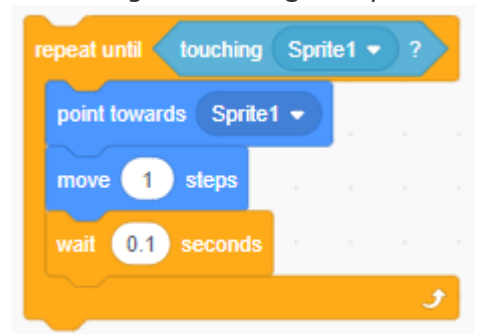
The Bad Guy Is Coming

10 Games are not much fun without bad guys. Let's add one:

- Add a new Sprite in the same way as you added the bananas earlier. I found my one in the fantasy folder. I picked the snowman.

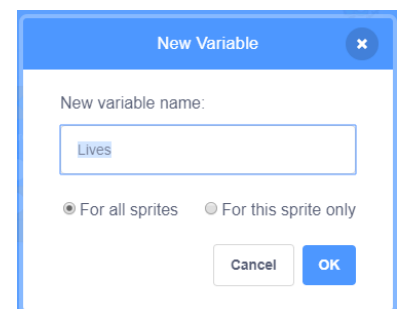
11 For the code part, we would like to make the bad guy follow the cat. This is quite easy to do. We make a loop and each time it goes around we tell it to point towards the cat (sprite 1) and to move one step forward. Like this

- From *Control* pick the "repeat until" loop. From *Sensing* pick the "touching" and change to *Sprite1*
- From *Motion* pick the "point towards" block and again change to *Sprite1*. From the same section pick the "move steps" and change the number to 1
- From *Control* pick the "wait seconds" and change the number to 0.1



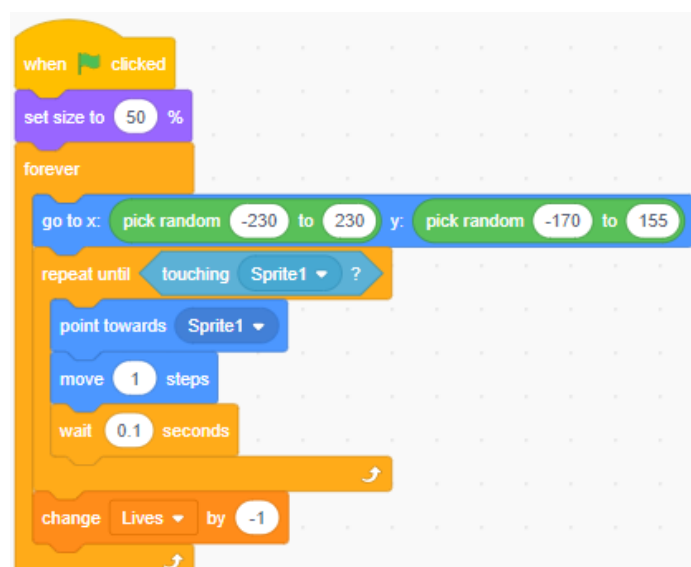
Not a lot is happening yet, but bear with me, it's worth the wait

12 We need another variable Add one called "Lives"

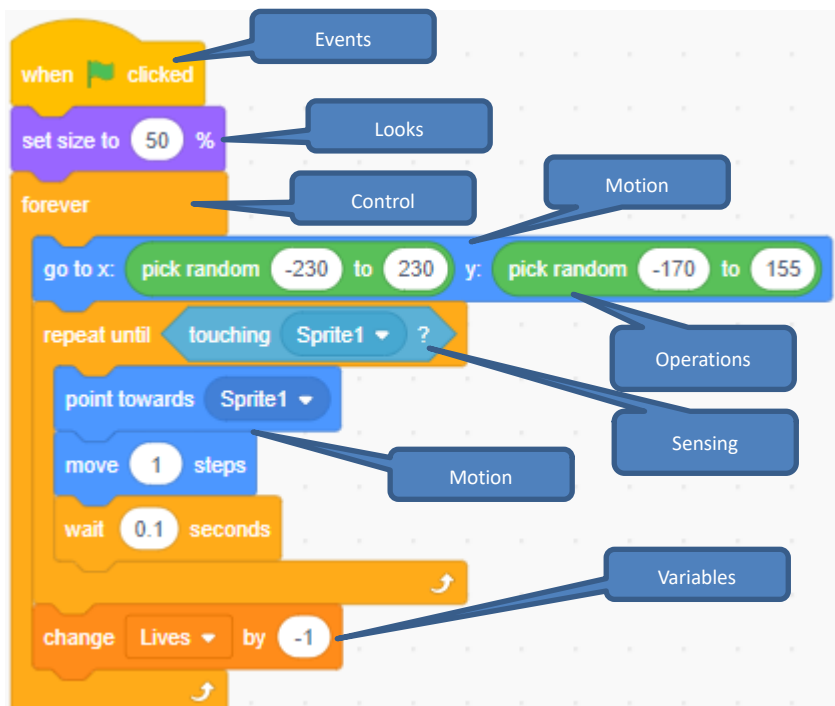


13 Now add the following to your code. See if you can find the code without my help.

Tip : The colours are your friend !!



Did you find everything. Here's the answers – check your code to make sure it matches, all the numbers are the same, and you have the right options for the drop downs.



So now:

- The game will run when you click the green flag (the start of the game).
- It will set the size of the sprite so it is a little smaller and then start to loop forever.
- Each time it loops (touches Sprite1 – Cat) it will be one life for our cat.
- It places the snowman in a random place on the screen.
 - It then starts the loop we did earlier which makes the snowman walk until he gets to the cat.
 - When he does, we take a life off the cat and the snowman loops again and jumps to a new location.
- The 'wait 0.1 secs' is a delay to slow the snowman down.

Any questions, just ask either your friend or one of the leaders.

Time to save

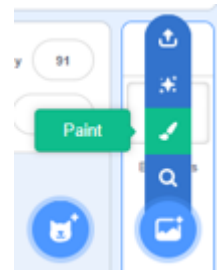
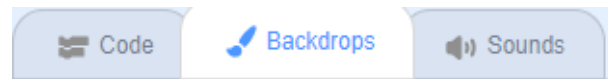
And now time to test

- ✓ Is everything working as you would expect
- ✓ Play with the number – what happens?
- ✓ What happens if you change some of the drop-down values?
- ✓ Can you speed up and slow down the snowman?
- ✓ Don't forget to put the values back so I know where you are up to 🕒

Why Is It 'A-maze-ing' ?

14 Have you been wondering why I called this game 'A Maze Ing'? Here's why – let's create something for everyone to run around in. A Maze!!

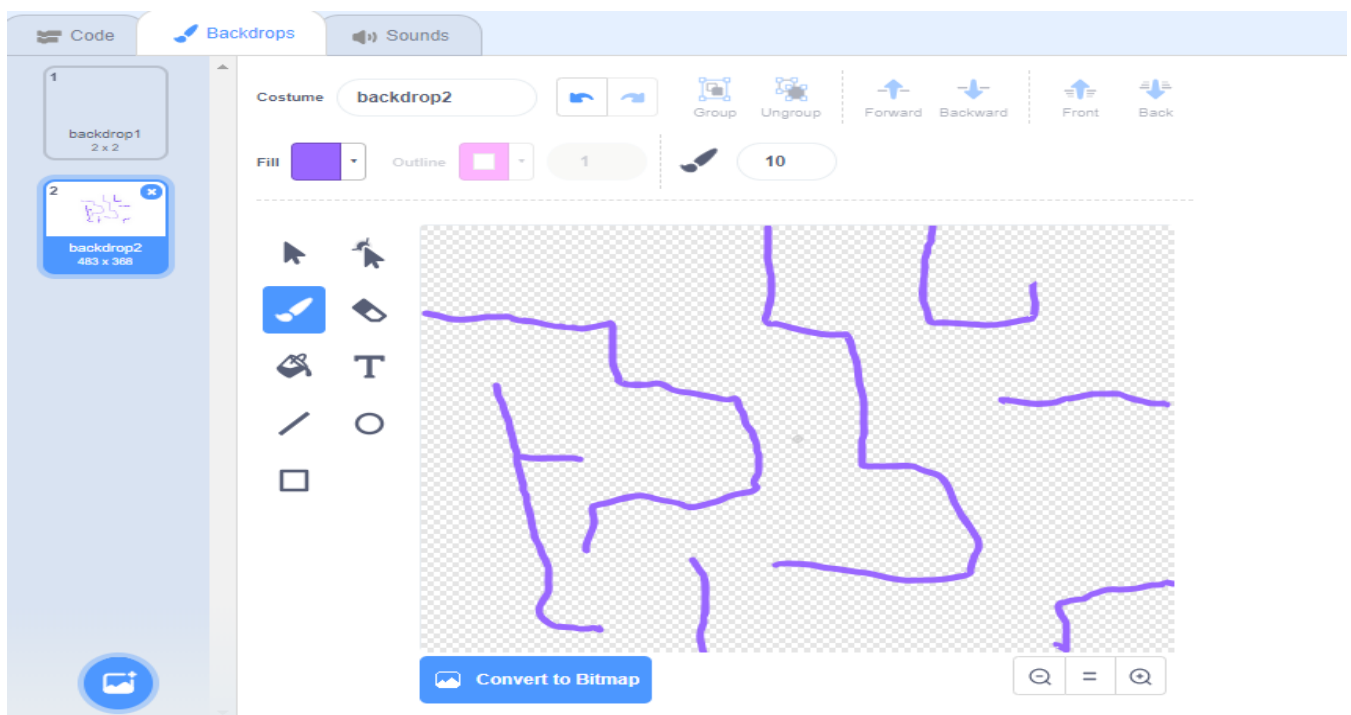
- Go to the bottom right of the screen where it says *Backdrops* - next to where you pick new sprites from. Hover over the picture of the scenery, and other options appear. Pick the *Paint* option
- You will notice the tabs at the top left change and you now have a *Backdrops* tab.



- The screen also changes completely and you get a blank checkered page. Time to show your artistic side!!
- Think of this as a piece of paper that you can draw on. First pick your colours in both *Fill* and *Outline* – we'll need these later. Next pick your tool – I picked a paintbrush - you could choose the line
- Stay and play a while. Get used to the different things you can create
- You will also see your design appear on the game page with your Sprites as you create it

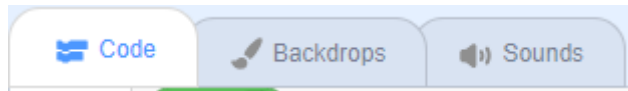
I'm not very good at art, so here's my maze – yours will probably look quite different (probably a lot better !!)

A quick tip – make sure the gaps are big enough for your cat – otherwise you may have a very short game! If you find your gaps are too small, use the eraser and make the gaps a little bigger



15 Ok back to the coding, this is Coderdojo, not Art-er-dojo (see what I did there 😊😊😊)

On the tabs, click on Code



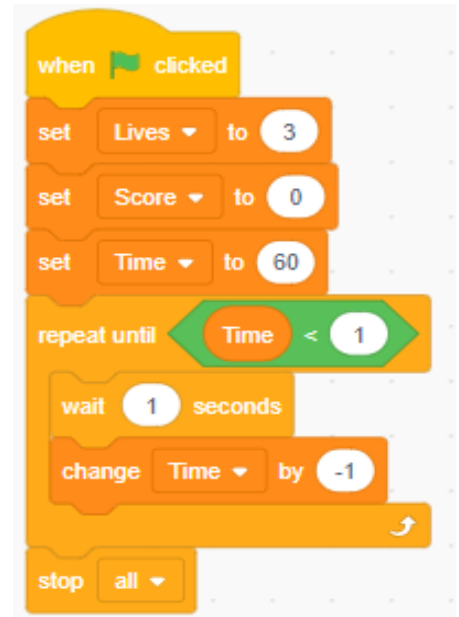
- Create one last variable and call it *Time*:
 - This will add a timer to the game and show the number of seconds we have left to play.

Now add this piece of code

- Click on the *Code* tab at the top of the stage and add in this code:

Here's what it does:

- The first few lines set our variables to the right values at the start of the game.
 - 3 Lives
 - 0 Points
 - 60 Seconds to play
- The part in the 'repeat until' loop will handle the time.
 - After the game starts, wait for 1 second and then reduce the variable "*Time*" by 1 to give 59... then 58... then 57....
 - This goes on and on until the variable "*Time*" is less than 1 and the time has run out.
 - Once time has run out the game stops



If you need help to understand this, ask one of the leaders, they will be very happy to explain it better

Time to Save

Now time to Test

- ✓ Is everything working as you would expect
- ✓ Play with the number – what happens?
- ✓ What happens if you change some of the drop-down values?
- ✓ Can you change your maze?
- ✓ Can you change the size of your sprites by adding code?
 - If not, we'll come to that bit later
- ✓ What happens if you have lots of time or lives? What if you don't have many of either – or both?
- ✓ Don't forget to put the values back so I know where you are up to 😊

He Can Go Through Walls !!

16 Hang on a second.... The cat can walk straight through walls! That's not right. Let's sort it out

- Click on the cat again and select the Code tab if it is not already on that.

We need to do a few things to get our cat under control.

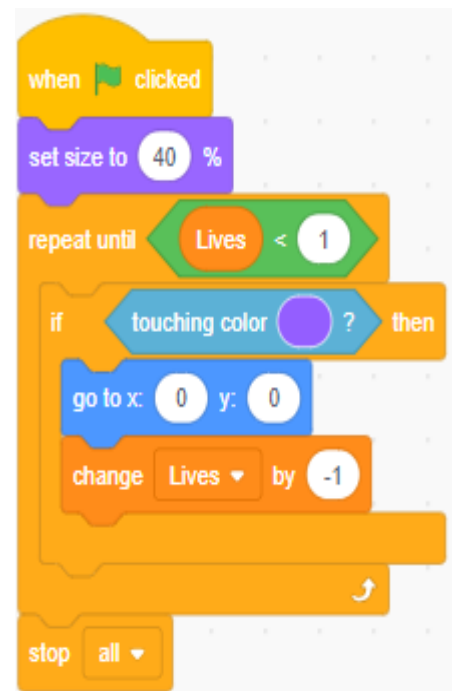
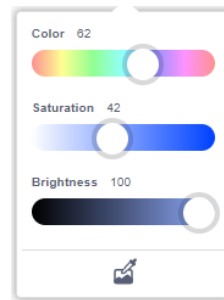
We need it to be a bit smaller so it fits in our nice new maze.

We need to stop him going through walls ... and we need to check he is still alive.

Try adding this new piece of code

When you come to the line that says '*touching colour*' click on the coloured oval and the box below pops up

- If you can remember the numbers for each of the sliders from when you picked your colour earlier, you can slide the buttons to the correct number
- However, there a much easier way!
 - Simply click on the dropper icon at the bottom of the box, now move your pointer across to the wall of the maze. Your pointer will change to a magnifying glass. Now click on a line on your maze, and the colour will be changed – you'll notice the sliders and numbers move to the right place too
 - If it goes white, you missed the line! No problem, just try again
- This bit of code means if you touch the line you lose a life and repeats until the lives have run out.



Did you know? ...A quick maths reminder.
 < means "Less Than" (it points backwards)
 > means "Greater Than" (it points forwards)

That should do it.

When he's out of lives (poor cat) he goes back to the middle of the screen. If your maze goes through this point he will die again and again and the game will end.

There are two fixes for this.

- You will need to either move the walls a bit so he lands in a safe space
- Change the x, y location the cat lands in so it is not right there.

17 The game is finished! CONGRATULATIONS 😊

Or should I say, that's my game finished, but this is YOUR game not mine. Time to put your own stamp on it and really show off what you've learned

Customise it now and add your own features to the game.

Here are some ideas -

- ✓ More bad guys
- ✓ Better bad guys who know how to go around the maze.
- ✓ Food that moves (my cat would LOVE that)
- ✓ Sound effects
- ✓ A better maze
- ✓ More than one maze – it could change as you get to level 2, and level 3, and.....
- ✓ A teleport button – for those moments when the cat is totally stuck (again my cat would also love that)

You can ask your friends or any of the leaders if you need any help

This project is heavily based on the project "Maze" from <http://inventwithscratch.com/mazegame/>

Click on the link for other ideas