

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

Start Your Project

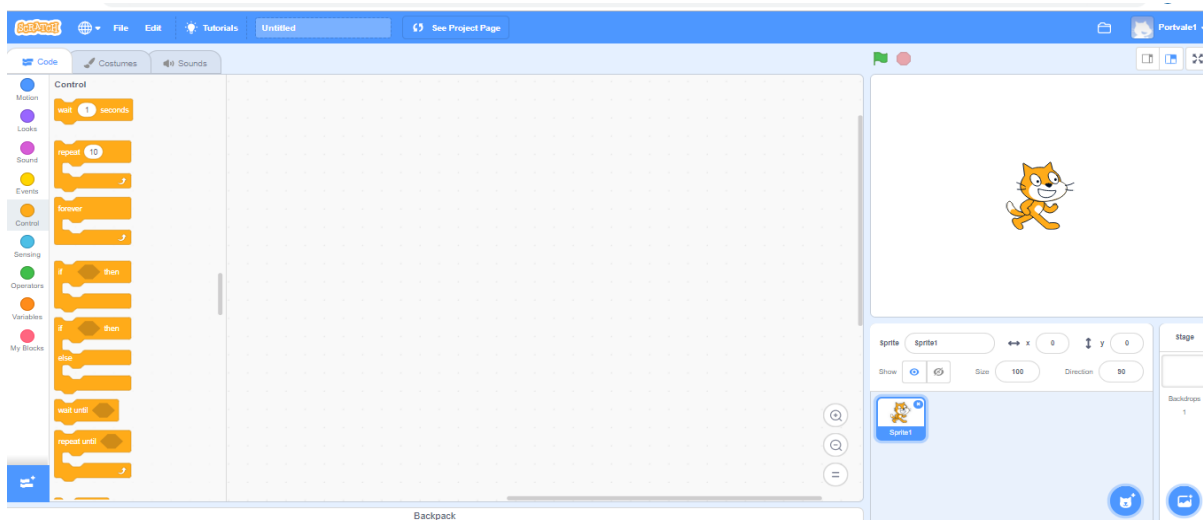
1. Open Scratch 3.0

For today's project, we will create the classic Nokia phone game "Snake". The snake is controlled by the user and gets longer, shrinks, speeds up or slows down, as the game progresses. However if you run into the wall or run into the hedgehog, it's Game Over !!



Before we start 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 (he's called Scratchy!) has a blue highlight around it to show which sprite you are coding. This is useful when you have more than one *Sprite*. Your starting screen should look like this



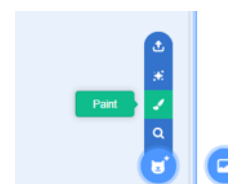
2. First thing we are going to do is to create the backdrop.

- Go to the *Backdrops* icon on the bottom far right of the screen and click on "Choose a Backdrop"
 - This opens the *Backdrops* library
- Select one you are happy with. I've chosen one called *Stars*. When you click on it, the picture will appear on the stage. You will also notice the *Backdrops* tab is highlighted and your new backdrop is also here
- On the left there is a column showing all of your available backdrops. We only need the *Stars* one, so you can click on the white screen, and then click on the white x to delete it

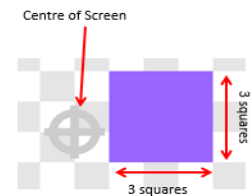


3. Next, we need to create the snake head as a sprite. There isn't a standard one, so we will use our artistic skills to create it

- This time go to the cat's head (next to where you chose your *backdrop*) and click on "Paint". This opens a graph page, and allows you to draw anything you like freehand.
- The snake is a simple block, but has to be a certain size to make sure it works perfectly. I found the easiest way to do this is to use the zoom keys in the bottom right of the paint screen.



- Click on the plus until the checkerboard is quite large
- Now create a block, using the square tool.
 - The square needs to be 3 squares long on both the horizontal and vertical - it's a square, not a rectangle!!
- Pick a colour and fill it in the same colour as the outline.
- Now reposition it so it sits in the centre of the screen.
- Click on the equal sign on the zoom controls to show the snake at 100%
- Finally, let's change the name of the sprite. Under the Stage, there is a cell called *Sprite*, let's change it from "*Sprite1*" to "*Snake*"
- OK, that's the snake head created
- We don't need Scratchy for this project, so you can delete him by clicking on him, then click on the white "x"



4. Now let's make the snake move, by using code.

- Make sure your snake is selected – it should be your only sprite - and click on the Code tab at the top of the page.
- From the *Events* section, drag across a "when green flag clicked" block
- From *Control*, add a "forever" loop
- Also from *Control*, add an "if then" loop and insert it inside the "forever" loop
- From *Sensing* drag the "key pressed" and insert it into the gap in the "if then" loop. Change the drop down to "up arrow"
- Now from *Motion* add a "point in direction". Click on the number and make sure it is pointed up. This should be the 0 value
- Now go back to the "if then" loop you just created, right click, and select "duplicate"
- This creates a copy of the blocks you just created
- Slot the copy under the first loop, so you have 2 loops next to each other, all nested inside the "forever" loop.
- Change the drop down on the duplicate to read "down arrow" then click on the value in the pointer and move it to the down position. This should be the 180 value
- Do this process twice more to create a left and right arrow option, and adjust the "point in direction" block accordingly
- Your code should look like this



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

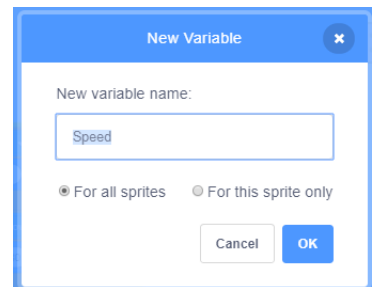
Now time to test your work

- ✓ Click on the green flag. What happens? Play with the numbers. What happens?
- ✓ Can you change the control keys?
- ✓ Don't forget to put all of the values back to the code above so I know where you are up to

Move and Create Me

5. What we have done so far controls the direction, now let's make our snake move.

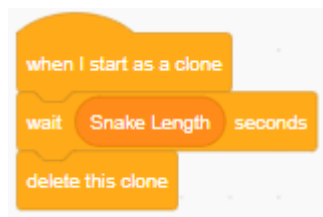
- First, we need to create a variable, as we want the speed to increase as the game progresses to make it harder. If you click on the *Variables* section you will see a block called "Make a Variable" which looks different to the other blocks. Click on this and a blue box opens up
- Type in "Speed", make sure the "For all sprites" option is selected, and click OK.
- You will now see an oval block has been created, called "Speed". Let's use this block in our code. You will also notice a Speed block has appeared in the top left of your game with a value. This is controlled by the tick box by the block.
- Back to our code, and from *Variables* add a "set to" block, just after the "when green flag clicked" block and make sure "Speed" is selected from the drop down. Enter the value of 3
- Now from *Motion*, add a "move steps" block to the end of the code, but inside the "forever" loop, and insert the "Speed" block we just created into the oval.
- Let's make sure the snake always starts from the centre of the screen, which we can easily do by adding one more block to our code. From *Motion* add a "go to x: y:" and make sure both number are zero. There is more information on co-ordinates in the [Scratch 3.0 Basics](#) sheet
- Your code should now look like this



6. We now need to give the snake some length, by using a technique called cloning. Here's how.
- First, we need another variable to control the length of the snake. Do as we did earlier in step 5. This time call it "Snake Length".
 - On your Snake Code page, from *Variables* add the "set to" block. Change the drop down to "Snake Length" and the number to 0.5
 - Add a "forever" loop
 - Inside the loop, also from *Control* add a "create clone of" and change the drop down to "myself"
 - Your code should look like this



7. In another white space add the following new piece of code, all from control, with the addition of your "Snake Length" variable block.



Time to save

Now test

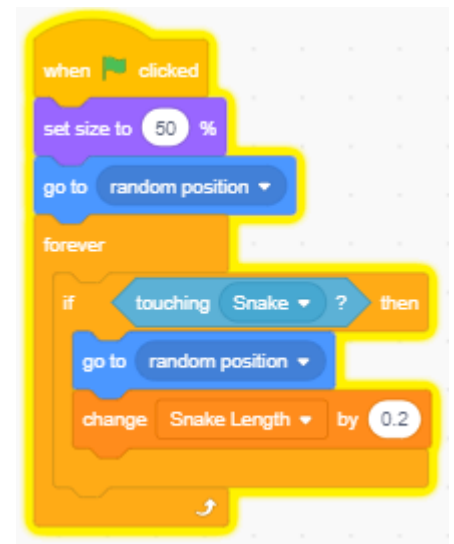
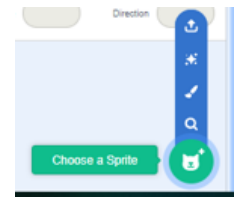
- ✓ Play with the numbers, what happens?
- ✓ Can you change the starting position of the Snake to the top left, or bottom right?
- ✓ Can you make the Snake move faster or slower?
- ✓ Can you make the snake bigger or smaller?

Don't forget to put all of the values back to the code above so I know where you are up to.

Feed, Grow, Shrink, Speed Me Up, Slow Me Down

8. We now need something to aim at. How about food, and as the snake eats the food it grows bigger and speeds up. Try this

- Click on the cat's head, but this time, click on "Choose a Sprite". This opens up the sprite library.
- Find something you like which looks like food. I'm using an apple, but you could choose something else – it's your game!
- Click on the *Code* tab and drag in a "when green flag clicked"
- First, we need to set the size as it's too big. From *Looks* add a "set size to %" block, and change the size to 50.
- Next, from *Motion* add a "go to random position" block
- Now add a "forever" loop and inside add an "if then" loop. Insert a "touching" block into the oval. Change the drop down to "Snake"
- From *Motion* add another "go to random position" block
- Finally, from *Variables*, add a "change by" block. Set the drop down to "Snake Length" and the value to 0.2.
- Your code should look like this.



9. Let's add another Sprite to make the snake speed up. You have done most of the work already, so here's a short cut

- Choose a new Spite to make the snake speed up. I've chosen the Lightning bolt
- Now go back to the *Apple* sprite and drag the whole code across to the new sprite. Once you see the *Lightning* sprite wobble, release your mouse clicker
- Now click on the *Lightning* sprite and you will see the code has duplicated. Now all we need to do is make one minor adjustment.
 - Find the "change Snake Length" block
 - Change the drop down to "Speed" and the number to 1
- Your code should look like this



10. We can use these skills, to add further sprites. The next is to slow the snake down

- This time I've used the "Stop" sign, but then used the Costumes tab and added text to say "Slow Down"
- Copy the Code from the "Lightning" sprite, but amend the "change speed" to -0.5
- Here's my new Sprite and the code



11. Finally let's also created a green apple to shrink the snake.

- This time right click on the Red Apple, and select "Duplicate"
- Click on the new Apple Sprite, then click on the Costumes tab. Use the controls to change the colour to green
- The code is already copied across, so just amend the "change Snake Length by -0.2"
- Here's my new Spite and the code



Time to save

Now test

- ✓ Add other sprites to give the snake different powers
- ✓ Or just duplicate the ones we already have to make more appear

Game Over

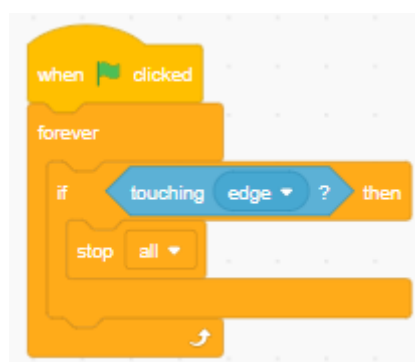
12. We need to be able to stop the game at some point, so we will do this in two ways.

- First, we are going to add another Sprite to do this
- Create a new sprite as you have done before. I've picked a *Hedgehog*
- Copy the code from the *Red Apple*
- Remove all of the code from inside the "if then" loop, but leave the *condition* in
- From *Control* add the "stop all" block
- Your code should look like this



13. Next, we are going to also stop the game if the snake hits the side, so back to the *Snake* sprite, and click on the *Code* tab. Add the following

- Start with a "when Green Flag clicked" block
- Attach a "forever" loop
- Inside this add an "If then", but this time from *Sensing* insert a "touching edge" block. You may need to change the drop down.
- Finally add a "stop all"
- Here's the code



Time to save

- ✓ Now test, and make sure everything works in the game as you would expect

I've run out of ideas, so my project is finished. Here's my finished game



But this is **YOUR** project not mine. Time to put your own stamp on it and really show off what you have learned

- ✓ Add multiple sprites with different powers
- ✓ Maybe you can use what you learned in the Letterland lesson to create a funky Instructions or Game Over Screen
- ✓ Ask your friends or the leaders for other ideas
- ✓ Add sound to you game
- ✓ Use ideas from the Scratch community
 -
- ✓ There are various You Tube Videos creating different versions of the game. Here one which this lesson was based on
 - <https://www.youtube.com/watch?v=Hukj0JWIHvQ>