

# Making a robot Controller

## Introduction

We're going to make a controller for the robot, so we can use the keyboard to control it.

## Step 1: Using keyboard Actions

### ✓ Activity Checklist

- ☐ Scratch has some great blocks for use controlling things. We want to use it to create a controller.
- ☐ We'll be using the blocks on the Events tab of Scratch
- ☐ Before you continue, make sure the 'Status' Orb is green!
- ☐ Add this code to get the robot to just move forward one step when the flag is clicked.



- ☐ These blocks work similar to the when flag clicked block



- ☐ Combine these with the following movement blocks to allow yourself to control the robot via the keyboard.



Move Right ▾

☐ These are the basic movement blocks, we can use keys to perform anything we want.

☐ Once you're done you should have something looking like this:

when up ▾ key pressed  
Move Forward ▾

when down ▾ key pressed  
Move Backward ▾

when left ▾ key pressed  
Rotate Left ▾

when right ▾ key pressed  
Rotate Right ▾

## Step 2: Controlling the speed

### ✓ Activity Checklist

☐ Let's use the number keys to set the movement speed as well.

when 1 ▾ key pressed

when 3 ▾ key pressed

when 4 ▾ key pressed

when 5 ▾ key pressed

when 6 ▾ key pressed

when 7 key pressed

when 8 key pressed

when 9 key pressed

☐ You can do 10-90 if you wish, or play around with it a little more.

☐ If you do 10-90 it should look a bit like this.

when 1 key pressed  
Set movement speed 10 %

when 2 key pressed  
Set movement speed 20 %

when 3 key pressed  
Set movement speed 30 %

when 4 key pressed  
Set movement speed 40 %

when 5 key pressed  
Set movement speed 50 %

when 6 key pressed  
Set movement speed 60 %

when 7 key pressed  
Set movement speed 70 %

when 8 key pressed  
Set movement speed 80 %



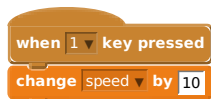
## Step 3: Less buttons

### ✓ Activity Checklist

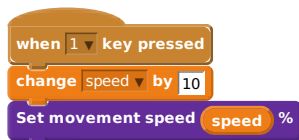
- ☐ It's nice using buttons to change the speed, but we're using a lot of structures for this!
- ☐ We're going to use variables to simplify this. Variables are basically saved items. You could name a variable Age, and give it value 10. Everytime you ask for Age it will give you 10. You can also update variables to new values.
- ☐ Let's go to the Data tab, and make a variable named Speed.
- ☐ The set Speed block does exactly what it says. It will assign the number you give it to the name speed.



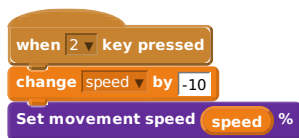
- ☐ Changing this variable will not update the speed of the robot. We have to do that ourselves.
- ☐ Let's use our keyboard blocks from before. We'll use the number 1 key to increase speed and the number 2 key to decrease speed.



- ☐ Again these blocks aren't doing anything to the speed, of the robot currently. However with variables we can use them in place of numbers.



- ☐ This will now update both the Speed variable, and the robot's speed everytime you pressed the 1 key.
- ☐ Let's do the same for decreasing speed.



- ☐ Now we can control our Robot with the arrow keys, and even control the speed with two number keys.

## Step 4: Limitting speed

### ✓ Activity Checklist

- ☐ If you know how percentages work, once it hits 100% the speed will no longer increase, however the variable will.
- ☐ We want to put a limit on this, otherwise decreasing the speed again may take a long time.
- ☐ Firstly we want what's called an if block. Found in the Control tab.



- ☐ What this code does is check the thing in the circle. Whatever we put in there must tell us either Yes or No.
- ☐ There's some operators that tell us Yes or No based on what we give them!



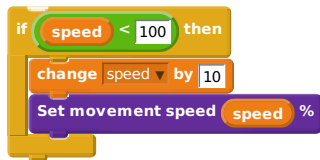
- ☐ All of these are things you will have seen in maths. For instance the first one, if the first number is greater than the second number it will return Yes, if it's not, it will return No. These answers we can then use in the if block.
- ☐ So we'll put one of these operators in the if then block. We want to use the less than block first.



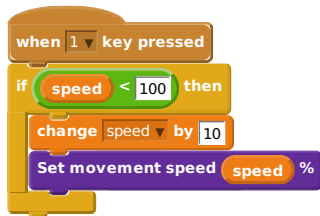
- ☐ And the thing we want to perform in the loop is to increase the speed so let's fill that in, too.



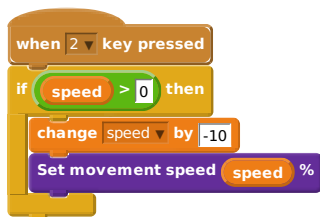
- ☐ And we only want the speed to increase if the speed is lower than 100%, so we can put that in too.



- ☐ Brilliant, we now have the functionality that will only let you increase speed to 100 let sadd it back to our press 1 key code.



- ☐ We want to do exactly the same to make sure speed cannot go lower than 0.
- ☐ This time use the Greater than operator and do the same as above but for decreasing speed and checking that the speed is higher than 0.



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 Save your project

