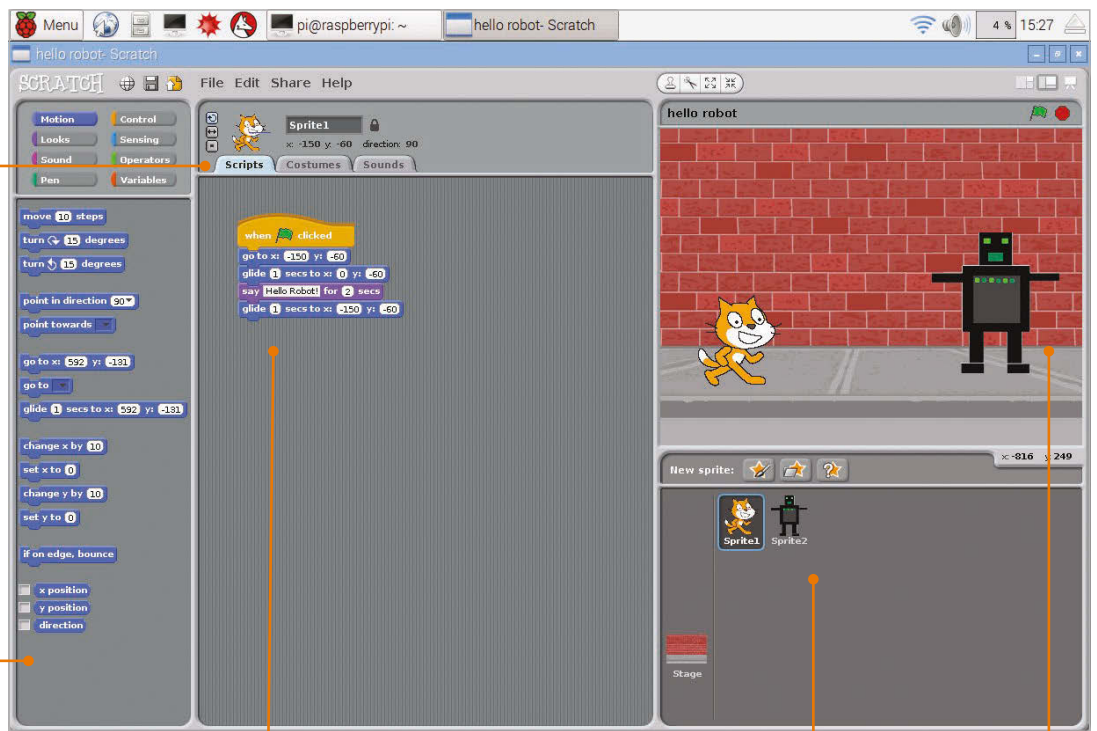


[CHAPTER ONE] GET STARTED WITH SCRATCH

Fancy yourself as Disney or Miyamoto? Whether your inspiration is Mickey Mouse or Mario, Scratch helps you to bring your creations to life...

Tabs: Click the tabs to choose between changing a sprite's scripts, costumes, or sounds

The Blocks Palette: This is where you find the commands to control your sprites. Click the rounded buttons at the top to switch between the different types of blocks



Scripts Area: Assemble your programs here by dragging blocks in from the Blocks Palette and joining them together

The Sprite List: Select your sprites here, so you can change their scripts or costumes. Click the Stage in the Sprite List to add scripts to it or change its background

The Stage: Watch your sprites move and interact here

Get things moving with Scratch! In a matter of minutes, you can build your first program to move the Scratch cat around the screen using the up, down, left, and right cursor keys. When you learn more later, you'll be able to develop this simple program into an art package with the cat as the pen, a game (where should the cat go?), or anything else that needs keyboard-controlled movement. As you work through this chapter, you'll learn how the Scratch screen is carved up, so you can easily find what you need as you build the other projects in this book.

If you're itching to write your own games or start building your own electronics projects, Scratch is the perfect place to start.

Its simplicity comes from the way you select commands from a menu and join them together like jigsaw pieces. Because Scratch comes with a collection of images and sounds, you can start making your first program in minutes.

Scratch's power comes from the many creative ways in which you can combine the commands to make your own program.

[KEEP UP TO DATE]

Get the latest version of Scratch by updating your operating system using: `sudo apt-get update && sudo apt-get upgrade`

[WHICH VERSION?]

If you're using online tutorials, check they're compatible with Scratch 1.4. The newer Scratch 2.0 for PCs and Macs is based on Flash and won't work on the Pi.

Right: Scratch comes with a library of sprites to choose from, including these fantasy sprites

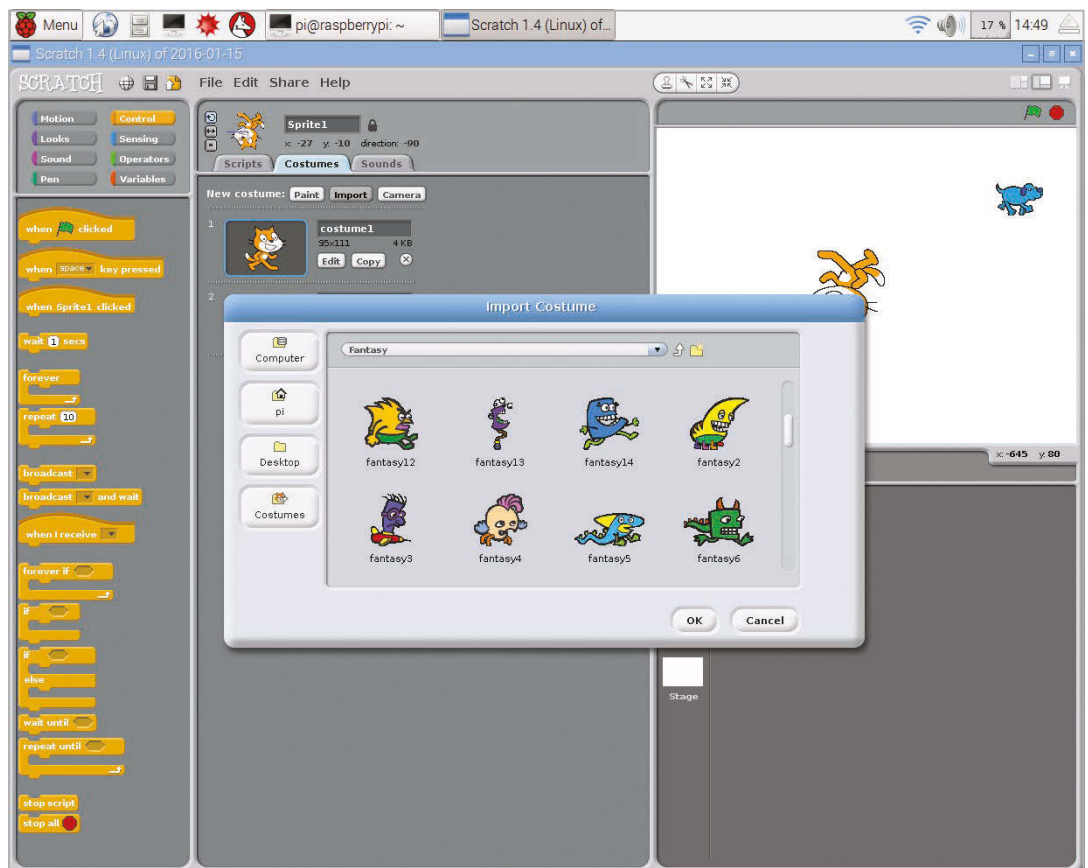
Finding your way around

The screen is divided into a number of panes, highlighted in our diagram on the previous pages.

Images that you can control in Scratch are called sprites. You can make them move, draw on the screen, respond to clicks, change their appearance, and interact with each other. A space game might have an alien sprite, a space ship sprite, and a missile sprite, for example. Many projects have more than one sprite, and you can choose between them by clicking them in the Sprite List, in the bottom right. Every new Scratch project includes the Scratch cat.

When you test your program, you'll watch your sprites on the Stage, in the top-right of the screen. Your games are more enjoyable when they fill the screen, though, so when you're ready to play properly, click the easel icon on the right above the Stage to zoom in.

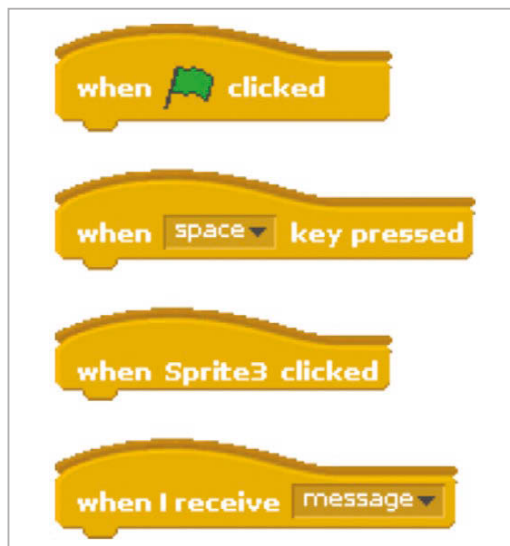
To make your sprites do something, you have to give them instructions that tell them precisely what to do and when. Those instructions come in the form of blocks that join together. The blocks are sorted into eight categories:



- Motion:** Used for moving sprites around the Stage.
- Looks:** Used for animating sprites, giving them speech bubbles, and changing their size and appearance.
- Sound:** Used for playing recordings or musical notes.
- Pen:** Used to draw as a sprite moves around the Stage. Great for making random art, and for special effects in games.
- Control:** Used to describe what happens when, and for making bits of your program repeat.
- Sensing:** Used to test whether your sprite is touching another sprite or another color, or to get information about other sprites. You can also use the sensor value blocks in your own electronics projects on the Raspberry Pi.
- Operators:** Used for maths, random numbers, and doing things to text. There are also blocks here for combining the blocks used in decision making.
- Variables:** Used to remember information, such as scores, timer values, or player names.

You can find all the blocks in the Blocks Palette on the left of the screen. The blocks are colour coded, so when you're copying programs from books or magazines you can find the blocks you need more easily.

In the middle of the screen is the Scripts Area. This is where you make your lists of instructions (or 'scripts') for your sprites.



[HAT BLOCKS]

The blocks with a curved top, like when space key pressed, are called hat blocks. They can only join at the top of a script.

Left: The hat blocks in the Control part of the Blocks Palette can be used to start your scripts



[GET ARTY!]

Can you add controls for pen up and pen down so you can use this program to draw on the Stage?

Making your first Scratch script

We promised you could make your first Scratch script in minutes, so here we go!

>STEP-01

Move 10 steps

When you open Scratch (it's listed under Programming in your Start menu), it shows the Motion blocks in the Blocks Palette. Click the **move 10 steps** block here and you'll see the cat move on the Stage. Each time you click, it only moves once. That's because '10 steps' is how far it moves, and not how many times. You can click on the 10 and type a different number in here to make it go further or less far with each click. Drag and drop the **move 10 steps** block in the Scripts Area.

>STEP-02

Combining blocks

Drag the **point in direction 90** block into the Scripts Area. If you drop it just above the **move 10 steps** block, they'll lock together. Look for the white

line that shows they're about to join before releasing your mouse button. If you click either of the blocks, Scratch will carry out the instructions in order, first pointing in direction 90 (facing right) and then moving 10 steps. Click the Control button above the Blocks Palette. Drag in the **when space key pressed** block and join it to the top of your two blocks. Your sprite will move to the right (direction 90) when you press the space bar.

>STEP-03

Making keyboard controls

Right-click your script and choose Duplicate. Click on an empty space in the Scripts Area to drop your copied script. Repeat until you have four identical scripts. Let's turn them into cursor key controls. Click 'space' in the first block to open the menu and choose 'up arrow'. In the **point in direction** block below, click '90' and choose '0' (up). Now when you press the up arrow, the cat moves up the screen. Edit the other scripts to add controls for left, right, and down. **Listing 1** shows the finished code.