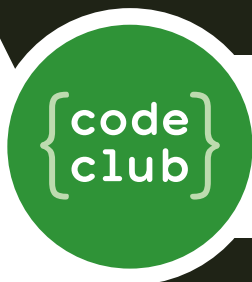# The MagPi ESSENTIALS

[CHAPTER THREE]
LOST IN SPACE

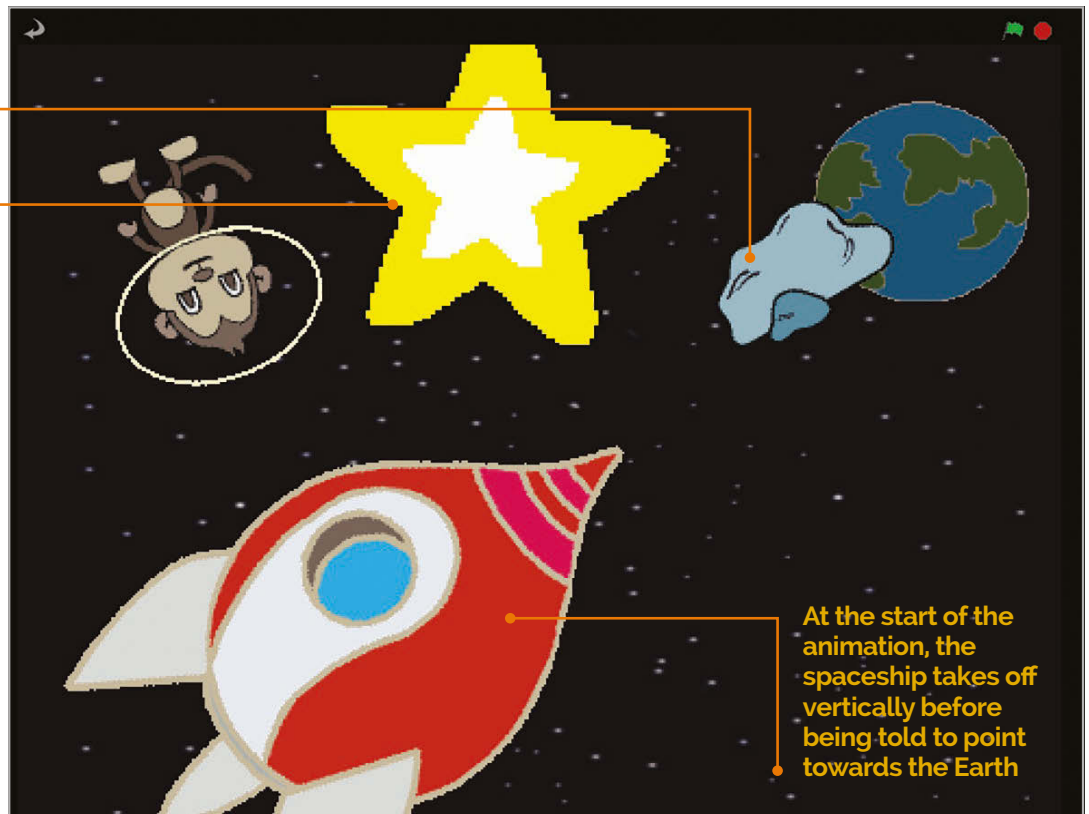Program your own animation of a spaceship heading for Earth, using a scaling effect to make the ship smaller as it moves into the distance

{ code club }

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This space rock floats around and bounces off the edges of the screen

The star is given a twinkling effect by scaling its size up and down repeatedly

At the start of the animation, the spaceship takes off vertically before being told to point towards the Earth

n this chapter, you'll be creating an animation sequence, which, perhaps unexpectedly, involves a rotating space monkey! This project will show you how to move, rotate, and scale sprites. This is something which will also come in very handy for other projects and games. So, start a new Scratch project and get ready to do some animating. If you need any help navigating the Scratch menus, refer to chapter 1.

>STEP-01
Prepare your artwork

After deleting the cat (right-click and Delete), it's time to import a new stage background and sprites. Let's begin by creating our space scene, changing the stage to a field of stars: click Stage in the Sprite List (bottom right), select the Backgrounds tab (top middle), then click Import and navigate to 'stars' in the Nature folder. Since none of the sprites used in this project is in the Scratch 1.4 library, you can download them (**magpi.cc/scratch_art**). First, let's import the Earth and Spaceship sprites: for each, click the star/folder above the Sprite List, then navigate to the folder where you've stored your sprites.
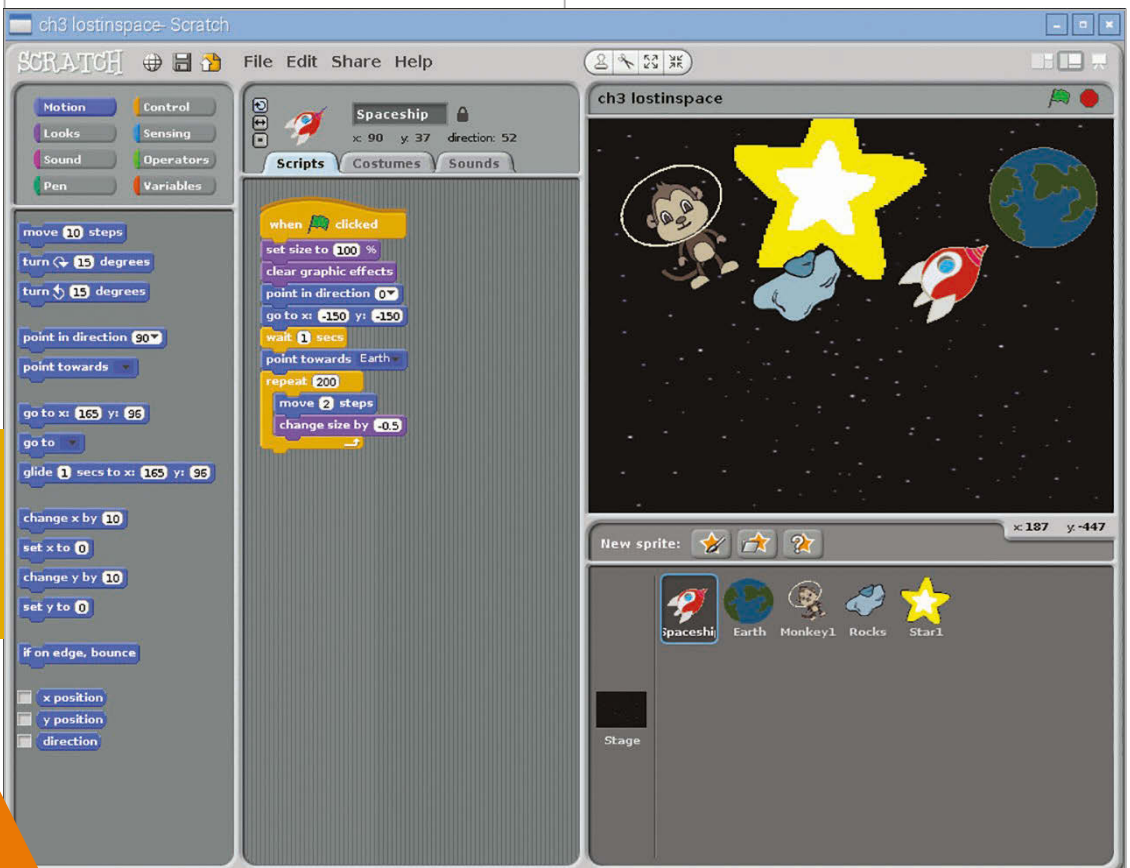
.01

```
when 🏴 clicked
set size to 100 %
clear graphic effects
point in direction 0
go to x: -150 y: -150
wait 1 secs
point towards Earth
repeat 200
    move 2 steps
```

>STEP-02
Move the spaceship

Click the Spaceship sprite in the Sprite List to select it, then click the Scripts tab. **Listing 1** shows the script you need to add to this sprite to make it move. First, we point it upwards (**point in direction 0**) and tell it to **go to x: -150 y: -150**, near the bottom-left corner. After waiting one second, we use the handy **point towards** Motion block to point it at our Earth sprite. We then use a **repeat** loop to keep moving it towards Earth, two steps at a time.

Right:
The spaceship points towards Earth and is gradually moved and shrunk within a repeat loop
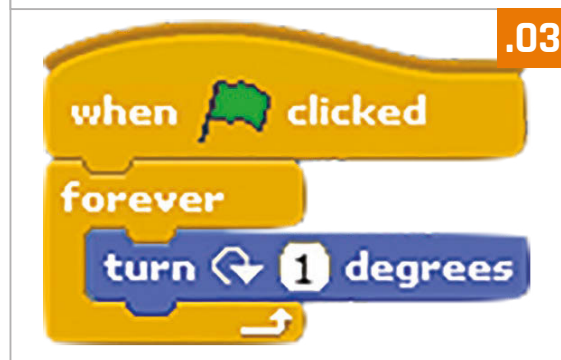
>STEP-03
Scale the ship

To simulate the spaceship moving further away from us, we need to gradually reduce its size as it moves towards Earth. This is easily achieved by adding a single extra block to its existing script. Click the Looks button in the top-left pane and then drag a **change size by** block and drop it just below your **move 2 steps** block, within the **repeat** loop. Change the 10 of the **change size** block to -0.5. The code should look like **Listing 2**. Now, try clicking the green flag to see your space rocket hurtle towards Earth, getting smaller all the time.
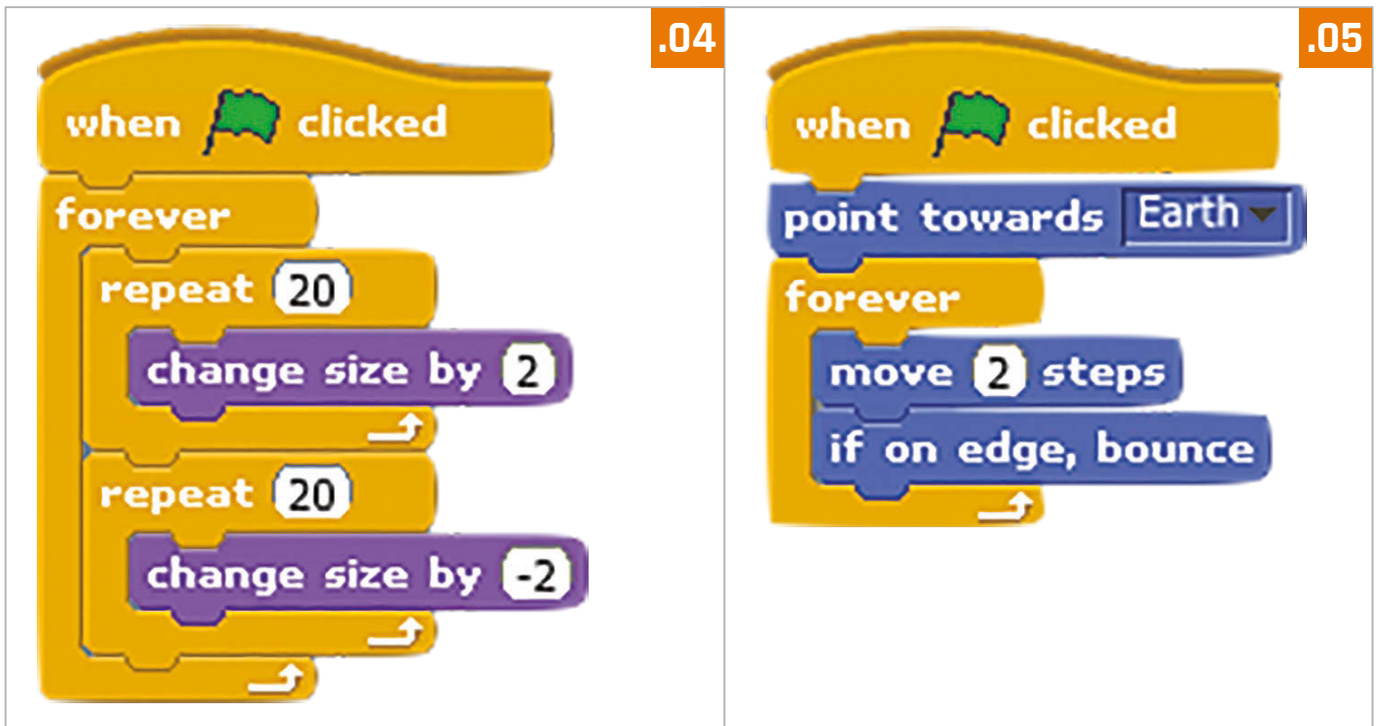
>STEP-04
Add a space monkey

Now let's add a few extra features to our space scene. For a bit of fun, we'll add a floating monkey who's lost in space. Click on the star/folder icon again and navigate to your Lost in Space sprites folder, then select Monkey. As with any sprite, you can adjust its size using the Grow/Shrink sprite icons above the stage. Now let's give our monkey a space helmet! Select it in the Sprite List, then click the Costumes tab and the Edit button. In the Paint Editor, select the Ellipse tool, the outline option (on the right) below the tools, then

.02

.03

Below:
In the Paint Editor, draw an ellipse around the monkey's head to give him a space helmet

.04

.05

a yellow colour from the palette. Now draw a yellow ellipse around the monkey's head for a helmet. To make things more interesting, we'll make our monkey spin around by adding the simple looping script in **Listing 3**.

>STEP-05
Bounce and shine
Finally, we'll add a shining star and bouncing rock. Import them both from your Lost In Space sprites folder, then position and scale them on the stage to your liking. For the star, add the code from **Listing 4** (two **repeat** loops inside a **forever** one) to repeatedly scale it up and down in size. Add the **Listing 5** code to the rock to get it moving, including a special block (as used in chapter 2) to make it bounce off whenever it reaches the edge of the stage.

>STEP-06
Taking it further
Your animation should look pretty cool by now. Try playing around with various parameters to see how they affect the speed, movement, and scaling of the objects. You could also add your own touches, such as using a **change color effect** block to give the spaceship a fancy disco-light effect as it moves!