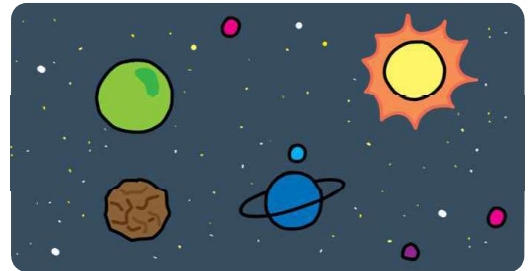


# Projects

## Lost in space

Learn how to program your own animation!



## Step

### 1 Introduction

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You are going to learn how to program your own animation!

#### What you will make





## What you will learn

- Use a repeat loop to animate a sprite in Scratch
- Use a forever loop to repeat an animation indefinitely
- Understand that loops can be nested within each other

## Step

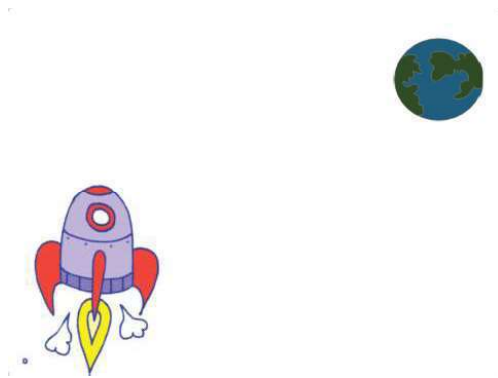


## 2 Animating a spaceship

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- Use a repeat loop to animate a sprite in Scratch
- Use a forever loop to repeat an animation indefinitely
- Your first step will be to create a spaceship that flies towards the Earth!
- Understand that loops can be nested within each other

Add 'rocketship' and 'Earth' sprites to your Stage.

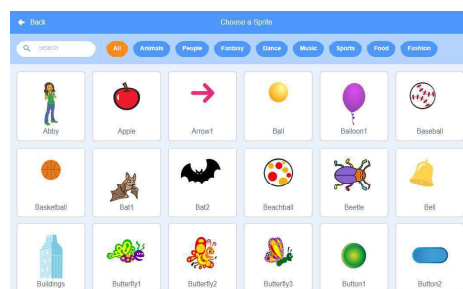


## Add a sprite from the Sprite Library

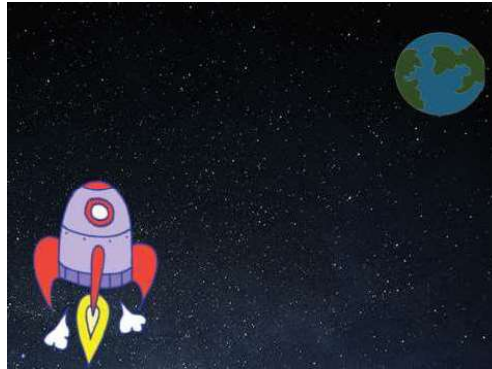
Click on **Choose a Sprite** to open the Sprite Library:



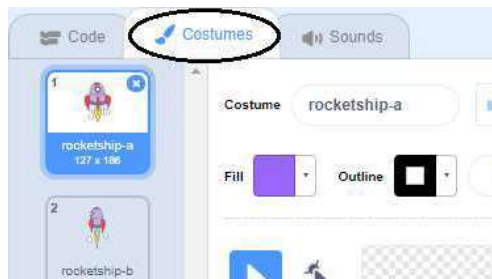
You can search for a sprite, or browse for one by category. Click on a sprite to add it to your project.



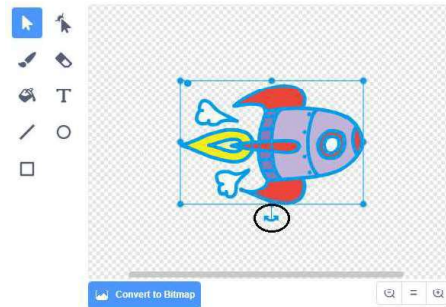
Add the 'Stars' backdrop to your Stage.



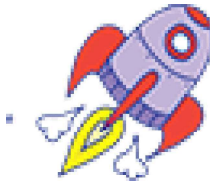
Click on your spaceship sprite, and click on the **Costumes** tab.



Use the **arrow** tool to click and drag a box around the whole spaceship image. Then click on the circular **rotate** handle, and rotate the image until it is on its side.



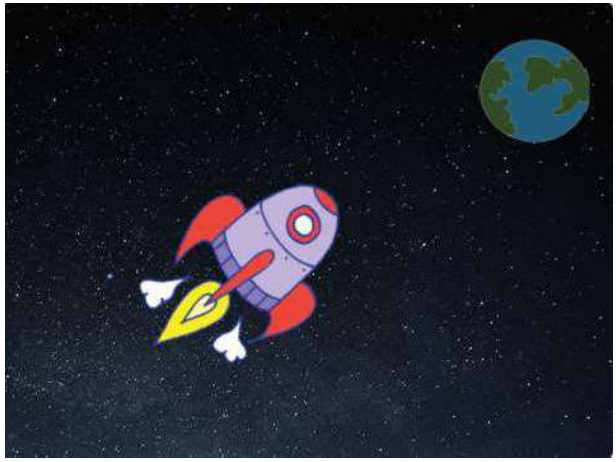
Add this code to your spaceship sprite:



```
when green flag clicked
  point in direction 0
  go to x: -150 y: -150
  say Let's go for 2 seconds
  point towards Earth
  glide 1 secs to x: 0 y: 0
```

Change the numbers in the code blocks you've added so that the code is exactly the same as above.

If you click the green flag, you should see the spaceship speak, turn, and glide towards the centre of the stage.





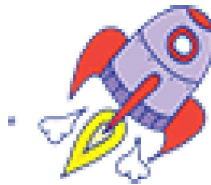
## Challenge!

### Challenge: improve your animation

Can you change the numbers in your animation code so that:

- The spaceship moves until it touches the Earth?
- The spaceship moves more slowly towards the Earth?

You'll need to change the numbers in this block:



glide

1

secs to x:

0

y:

0



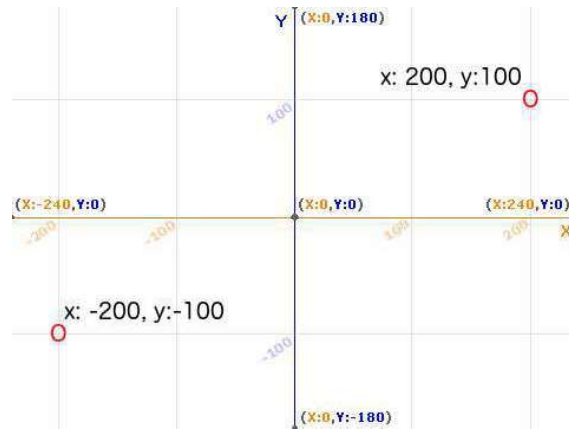
### Scratch coordinates

#### Scratch coordinates

- In Scratch, the coordinates **x:0, y:0** mark the central position on the Stage.

A position like **x:-200, y:-100** is towards the bottom left on the Stage, and a position like **x:200, y:100** is near the top right.





- You can see this for yourself by adding the **Xy-grid** backdrop to your project.



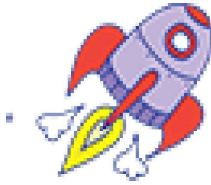
## Step

### 3 Animation using loops

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Another way to animate the spaceship is to tell it to move a small amount many times

Delete the **glide** block from your code. To do this, drag the block off the Code area and drop it back where the other single code blocks are.



when  clicked

point in direction 0

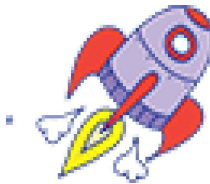
go to x: -150 y: -150

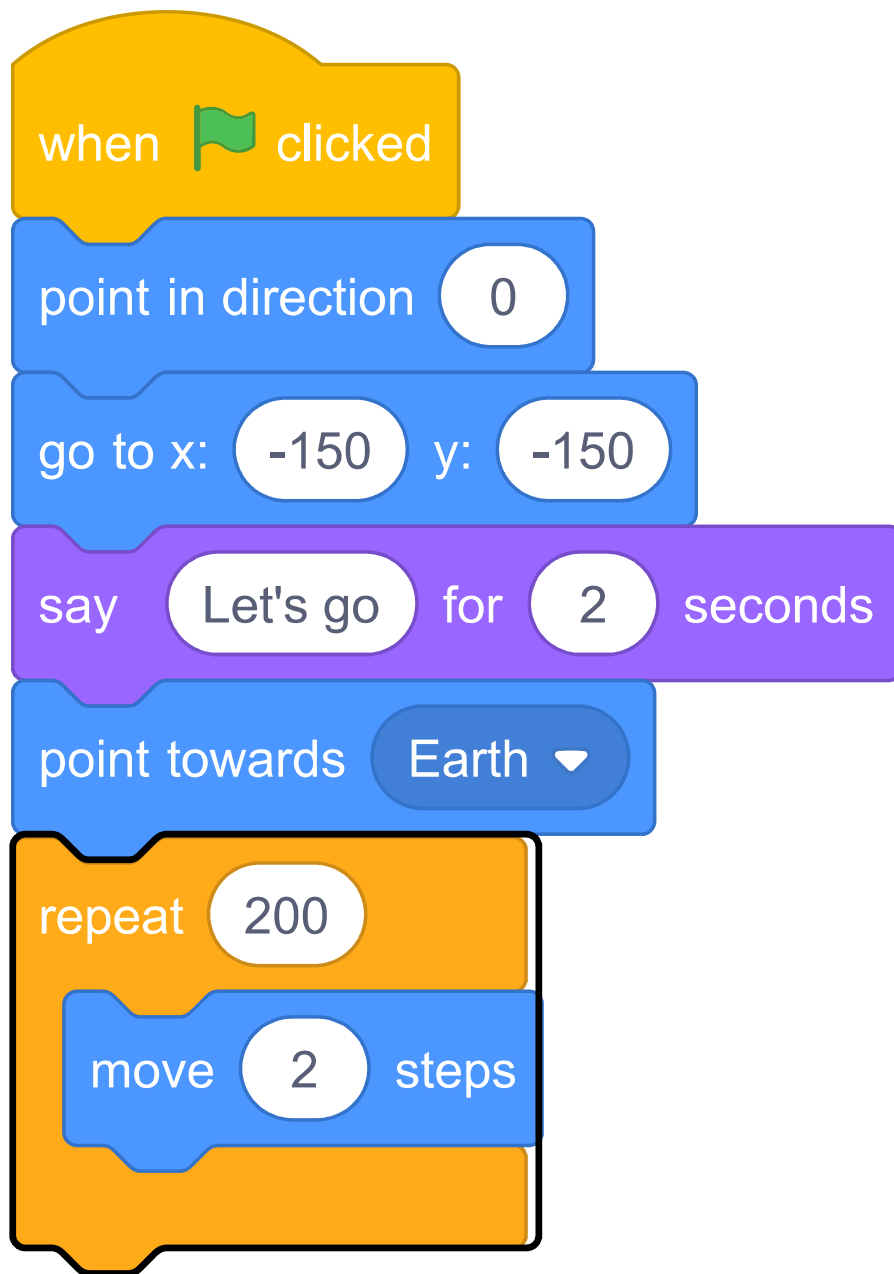
say Let's go for 2 seconds

point towards Earth ▼

~~glide 1 secs to x: 0 y: 0~~

Now use a **repeat** block to move your spaceship towards the Earth.



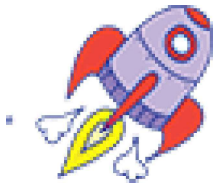


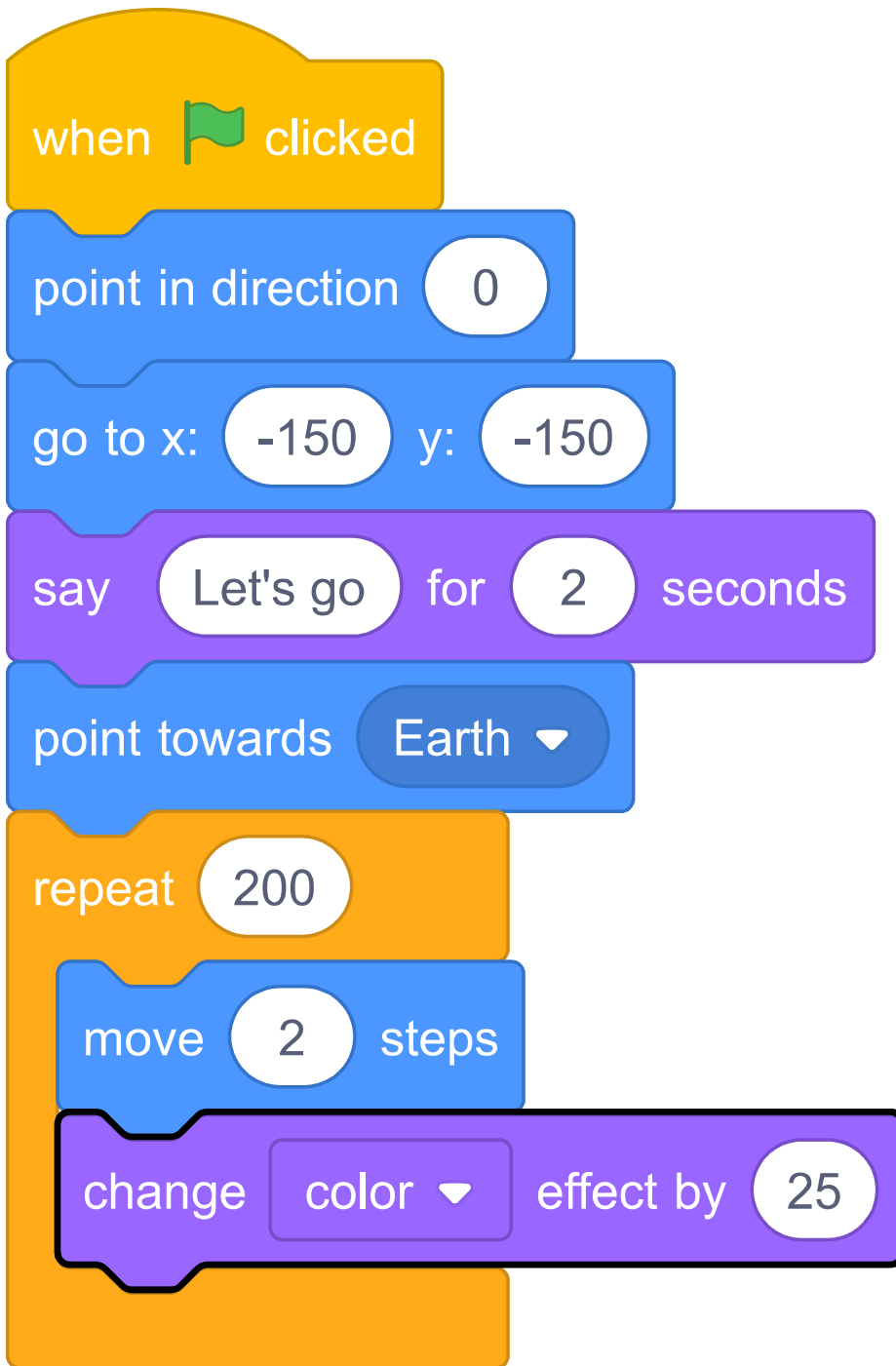
Test and save your code. Your spaceship should move towards the Earth exactly as before, but this time it uses a **repeat** block.

Next add code to your spaceship sprite so that the spaceship changes colour as it moves towards Earth?

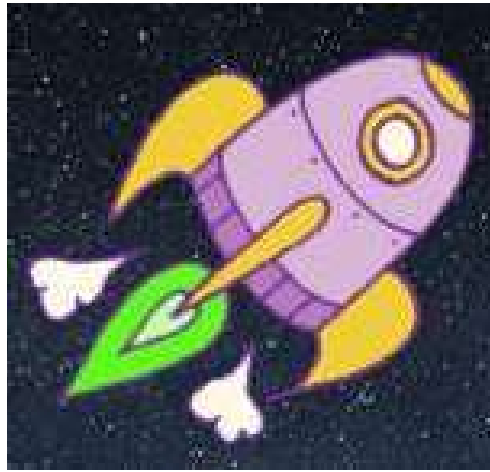


Use this block:





Test and save your code.



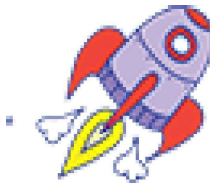


Can you make your spaceship get smaller as it moves towards Earth?



### **I need a hint**

Your code should look like this:



when  clicked

set size to 100 %

point in direction 0

go to x: -150 y: -150

say Let's go for 2 seconds

point towards Earth ▼

repeat 200

move 2 steps

change color ▼ effect by 25

change size by -0.3

Test and save your code. Your spaceship should now get smaller as it moves. Test your spaceship a **second time**. Is it the right size when it starts?



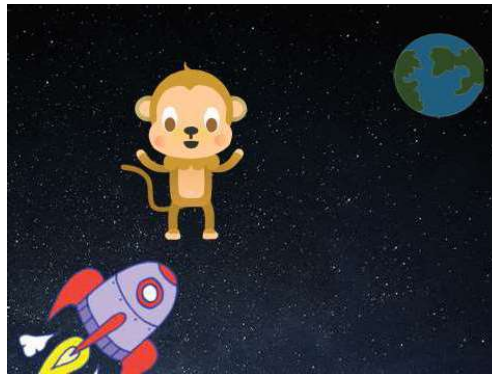
# Step

## 4 Floating monkey

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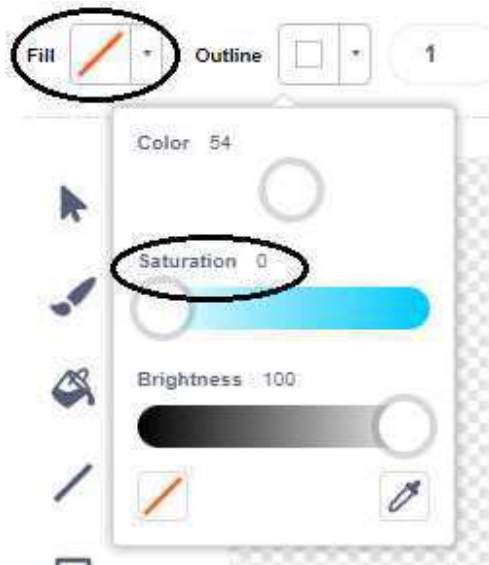
Now you will add a monkey who's lost in space to your animation!

Start by adding the 'monkey' sprite from the library.

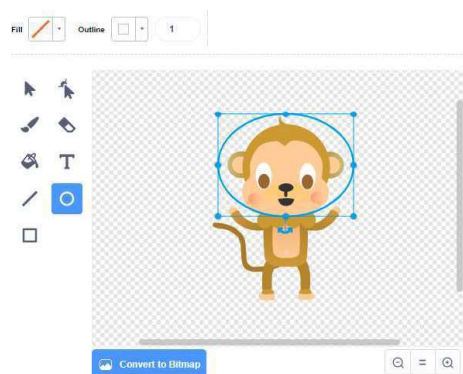


Click on your new monkey sprite and then click on **Costumes** so that you can edit how the monkey looks.

Set the fill to be transparent by selecting the red line. For the outline, set a white colour by moving the Saturation slider to 0.



Click on the **circle** tool and then use it to draw a white space helmet around the monkey's head.

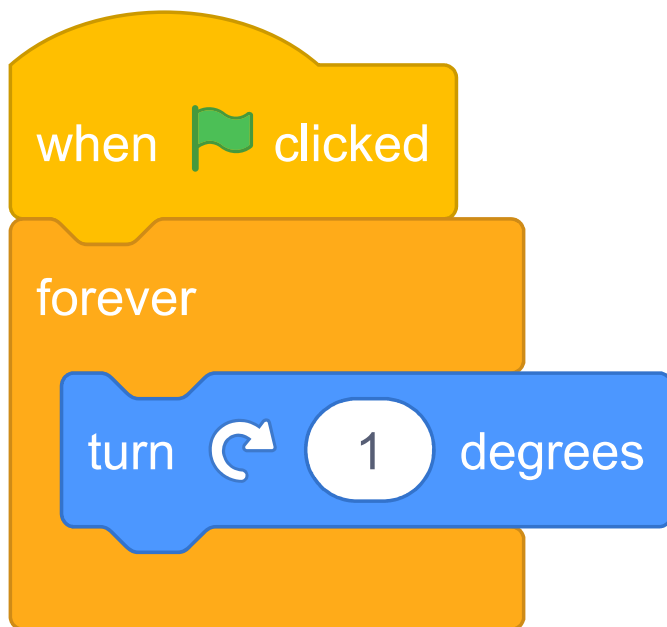


Can you add code to your monkey sprite so that it spins slowly in a circle forever?



### I need a hint

Here's the code to make your monkey spin:



Test and save your project. You'll have to click on the red **stop** button to end this animation, as it runs forever!

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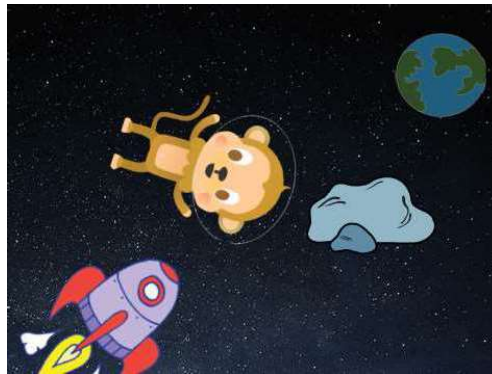
# Step

## 5 Bouncing asteroid

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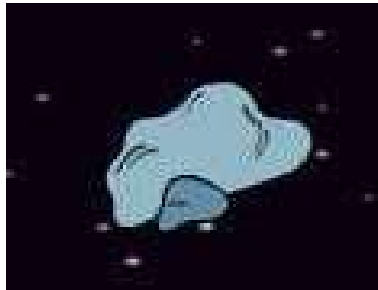
Now you will add a floating space rock to your animation.

Add a 'rock' sprite to your animation.





Can you add code for your rock sprite so that the rock bounces around the stage?



### **I need a hint**

Here's the code for making your rock bounce around the stage:



when  clicked

point towards Earth ▼

forever

move 2 steps

if on edge, bounce

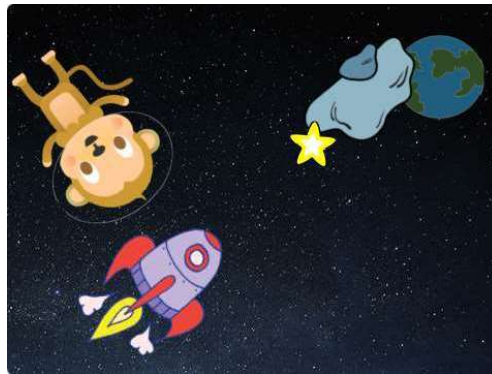
# Step

## 6 Shining star

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Now you will combine loops to make a shining star.

Add a 'star' sprite to your stage.



Can you add code to your star sprite to make the star repeatedly grow and shrink?



### **I need a hint**

Here's the code to make your star grow and shrink:



when  clicked

forever

repeat 20

change size by 2

repeat 20

change size by -2



## Challenge!

### Challenge: make your own animation

Stop your space animation, save it, and start a new Scratch project.

Use what you've learned in this project to make your own animation. It can be anything you like, but try to make your animation match the background you choose. Here are some examples:

