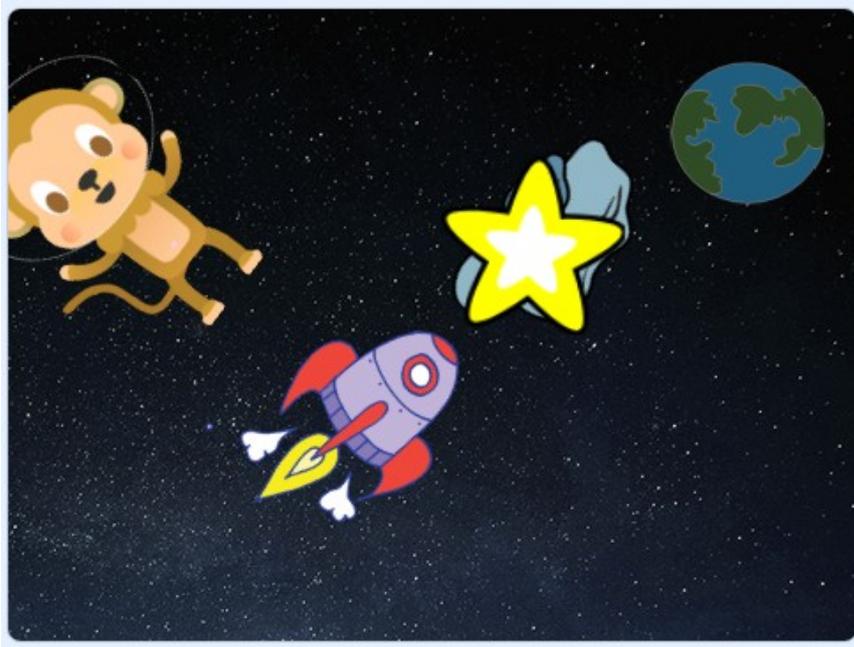


## Introduction

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

## What you will make



What you will need

## Hardware

- A computer capable of running Scratch 3

## Software

- Scratch 3 (either [online](#) or [offline](#))

## What you will learn

- Animate a sprite using a loop
- Change the appearance of a sprite

# Step 1: Animating a spaceship

Your first step will be to create a spaceship that flies towards the Earth!

## ✔ Activity Checklist



Open a new Scratch project.

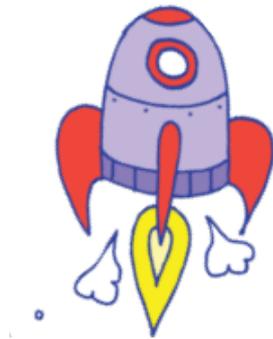
**Online:** open a new online Scratch project at [rpf.io/scratchon](https://rpf.io/scratchon).

**Offline:** open a new project in the offline editor.

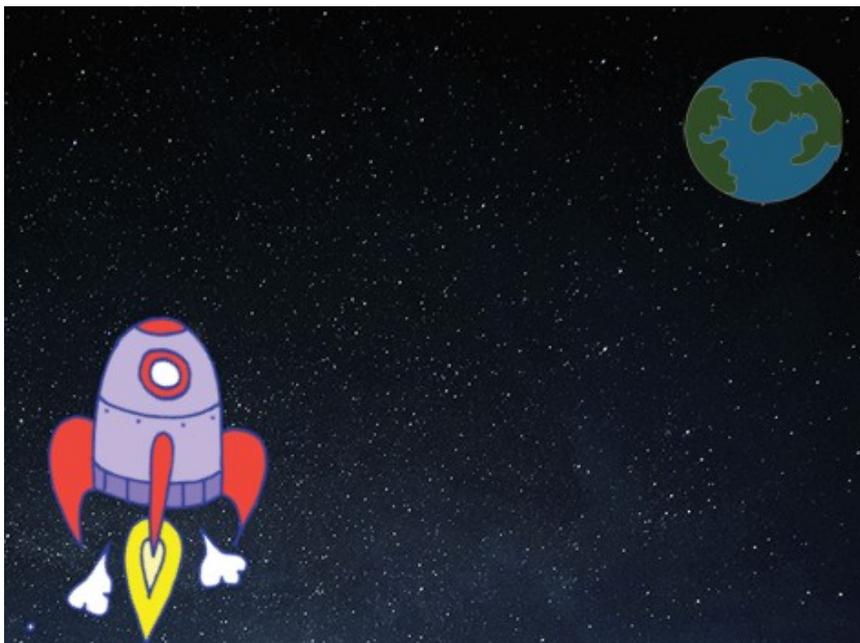
If you need to download and install the Scratch offline editor, you can find it at [rpf.io/scratchoff](https://rpf.io/scratchoff).



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

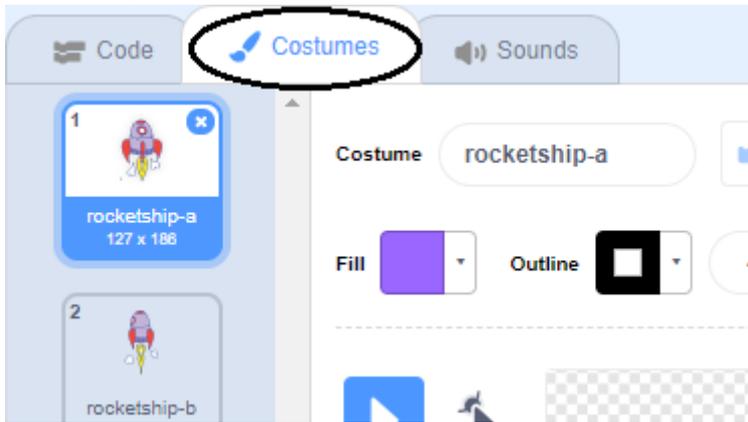


Add the 'Stars' backdrop to your Stage.

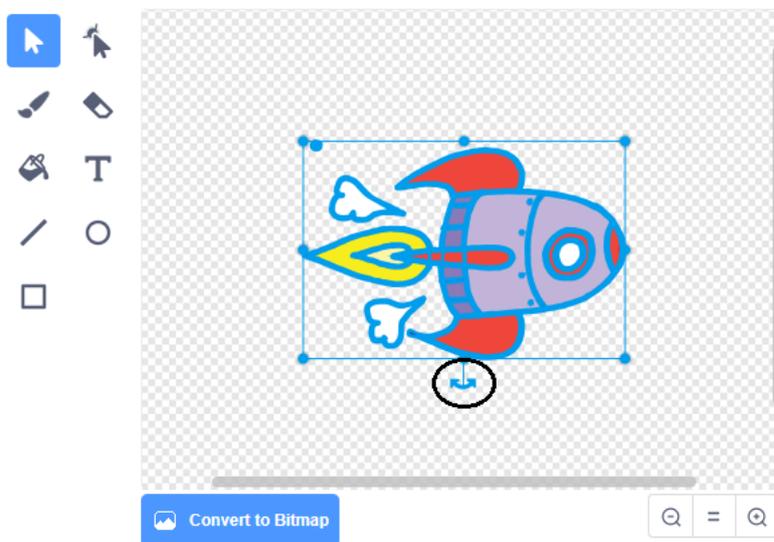




Click on your spaceship sprite, and click on the **Costumes** tab.



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.

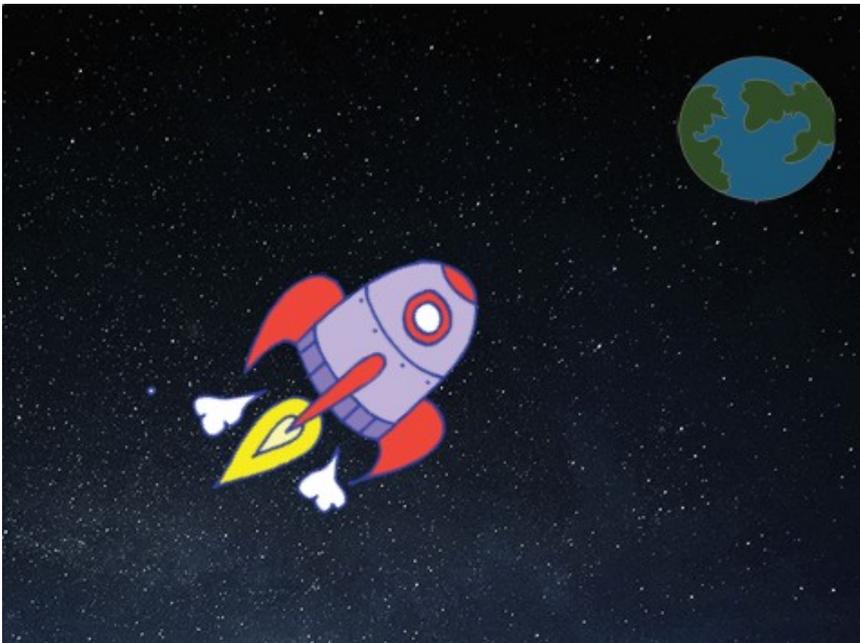


Add this code to your **spaceship** sprite:



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.

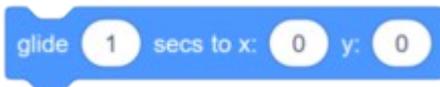


## Challenge: improve your animation

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:



## Step 2: Animation using loops

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

### ✔ Activity Checklist

- 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.

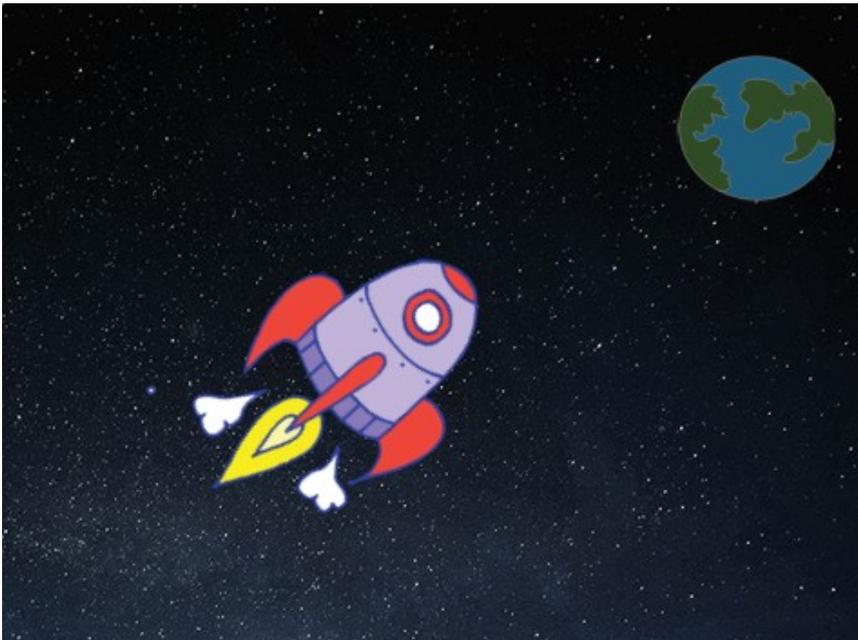
```

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

```



Can you use a **repeat** block to move your spaceship towards the Earth?



Instead of **gliding**, your spaceship should **repeatedly move** a few steps at a time.

Here is the code to animate your spaceship:

```

when clicked
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

```

You can use different numbers in the **repeat** and **move** blocks, as long as the spaceship still gets to Earth!

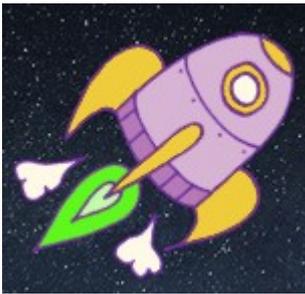
Test and save your code. Your spaceship should move towards the Earth as before, but this time it uses a **repeat** block.

- Can you add code to your **spaceship** sprite so that the spaceship changes colour as it moves towards Earth?

Use this block:

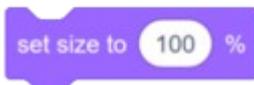


Test and save your code.

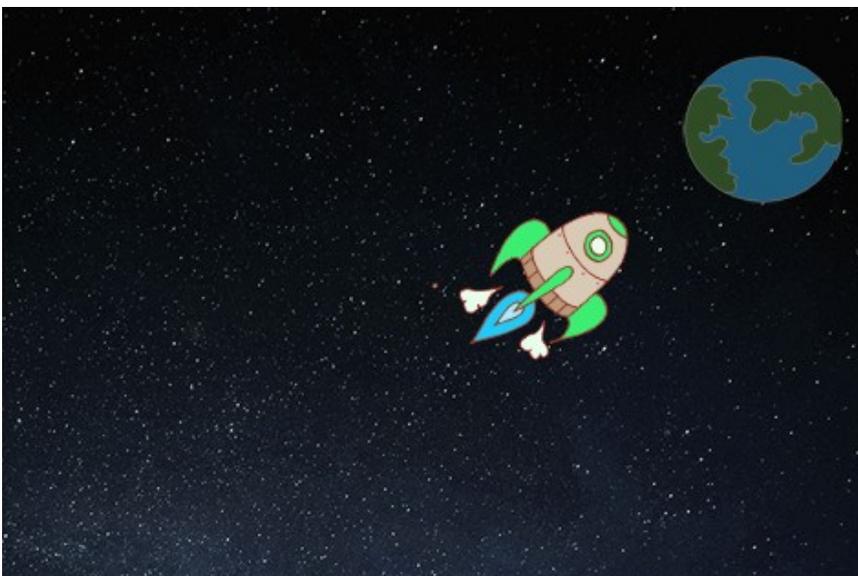


- Can you make your spaceship get smaller as it moves towards Earth? Your spaceship should start at **100% size**, and then **change size** by a small amount each time it moves.

Use these blocks:



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?

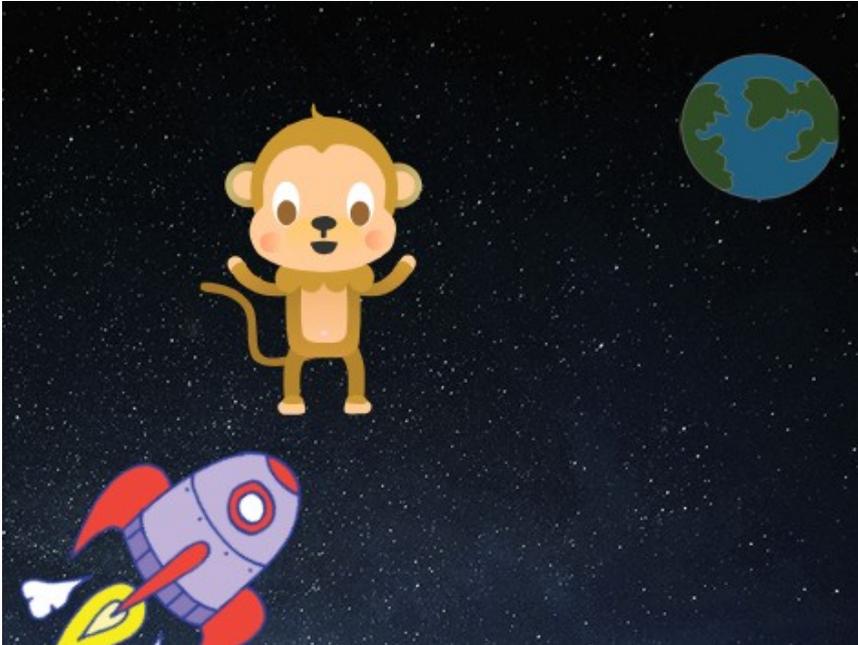


## Step 3: Floating monkey

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

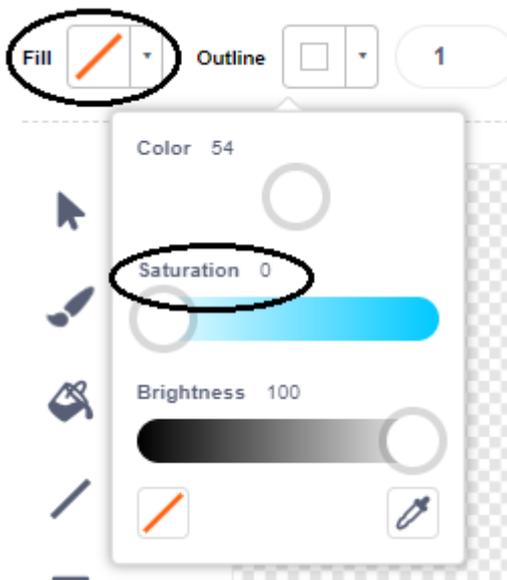
### ✔ Activity Checklist

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

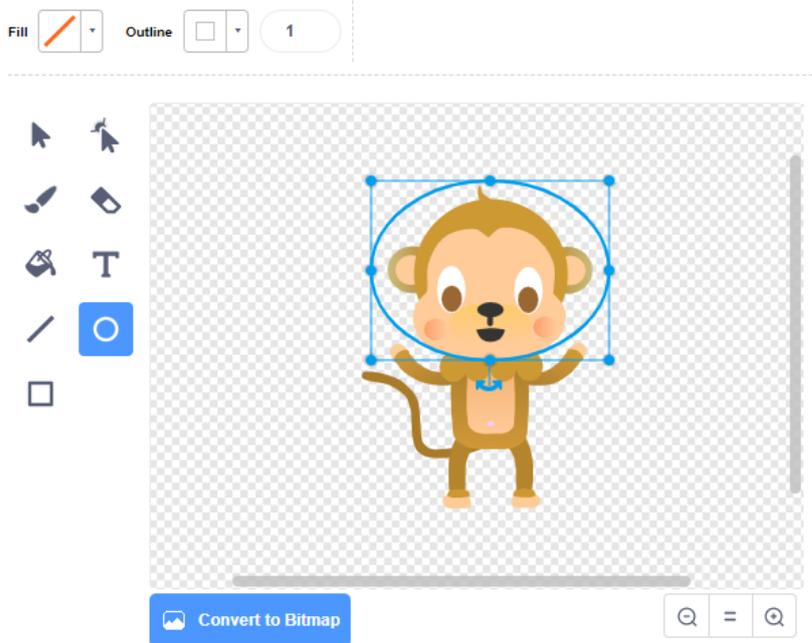


Click on your new monkey sprite and then click on **Costumes** so that you can edit how the monkey looks.

- 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.



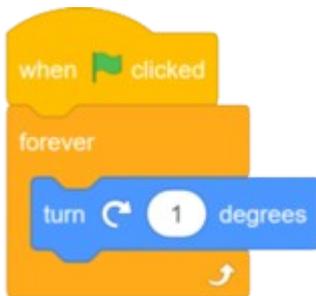
- Click on the **circle** tool and then use it to draw a white space helmet around the monkey's head.



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

When the green **flag is clicked**, your monkey sprite should **turn** in a circle **forever**.

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!

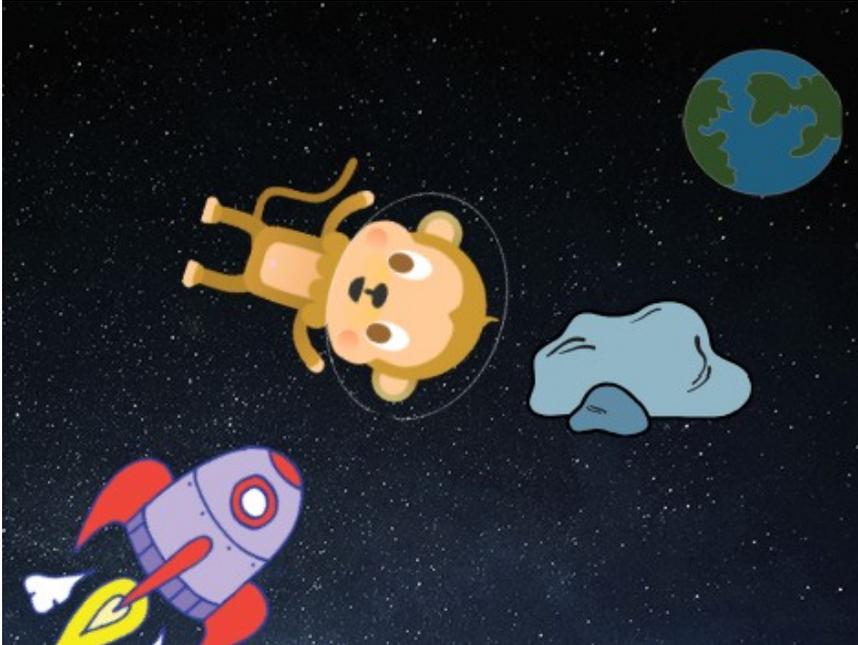


## Step 4: Bouncing asteroid

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

### ✔ Activity Checklist

- Add a 'rock' sprite to your animation.

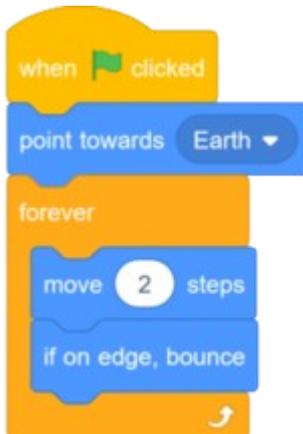


- Can you add code for your **rock** sprite so that the rock bounces around the stage?



When the green **flag is clicked**, your rock sprite should **move** and **bounce** around the stage **forever**.

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

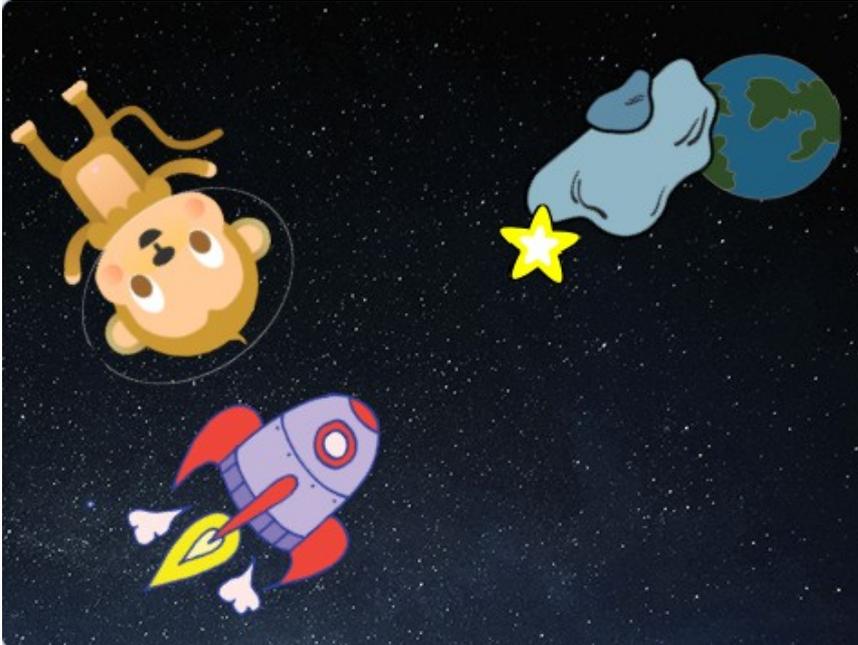


## Step 5: Shining star

Now you will combine loops to make a shining star.

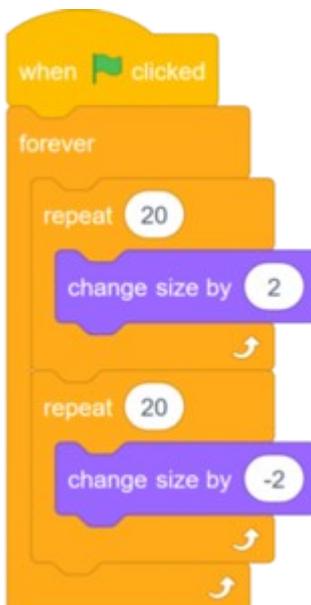
### ✔ Activity Checklist

- Add a 'star' sprite to your stage.



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

When the green **flag is clicked**, your star sprite should **change size** to get bigger a few times, and then **change size** to get smaller a few times. It should do this so that it gets bigger and then smaller **forever** and looks like it's shining light. Here's the code to make your star grow and shrink:



## 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:

