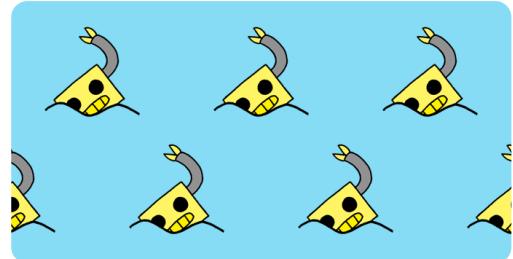


Synchronised swimming

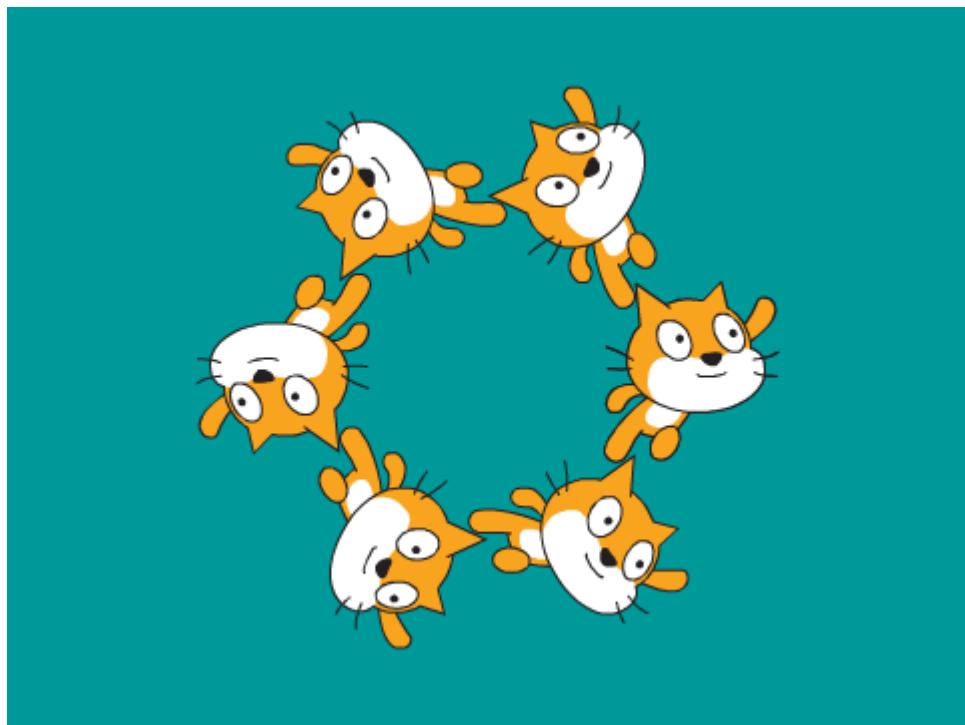
Celebrate the Olympics by programming a synchronised swimming routine.



Step 1 Introduction

You are going to learn how to program a synchronised swimming routine for Scratch the cat by using loops and creating clones.

What you will make





What you will need



What you will learn



Additional information for educators



Step 2 Swimming left and right

In synchronised swimming a team of swimmers perform a coordinated routine of moves to music.

Let's start by getting one cat swimming.

Open a new Scratch project.



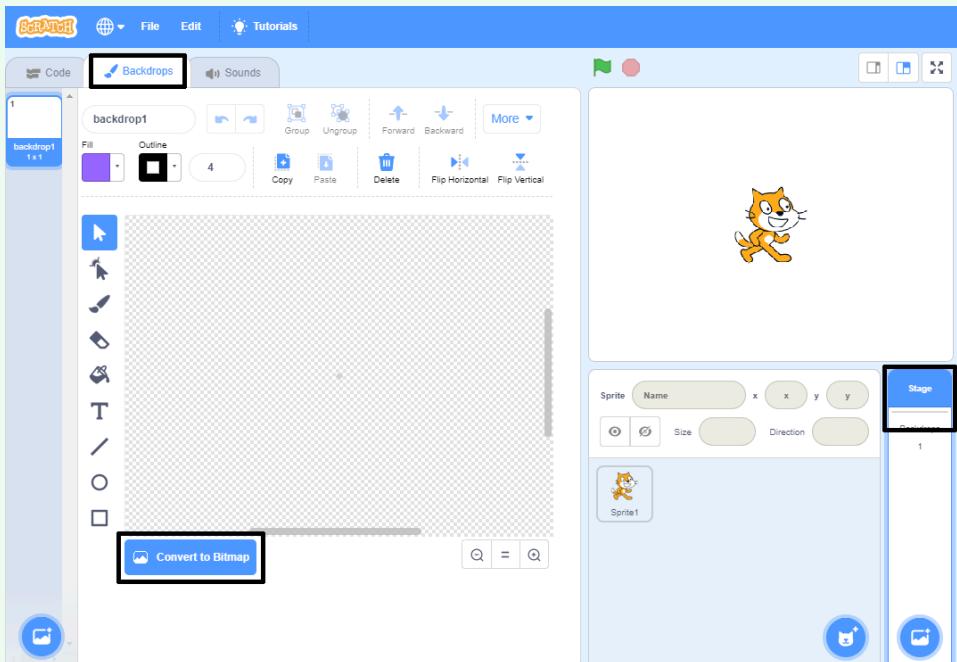
Online: open a new online Scratch project (<https://rpf.io/scratchnew>).

Offline: open a new project in the offline editor.

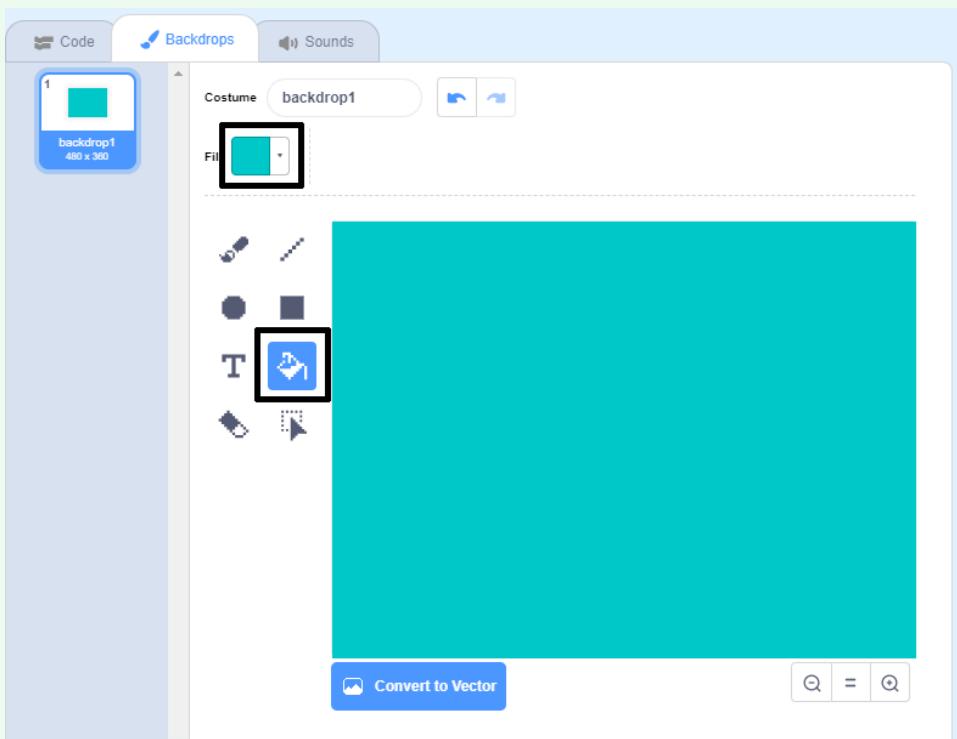
If you need to download and install the Scratch offline editor, you can find it at rpf.io/scratchoff ([h
tts://rpf.io/scratchoff](https://rpf.io/scratchoff)).

First let's turn the stage blue so it looks like a swimming pool.

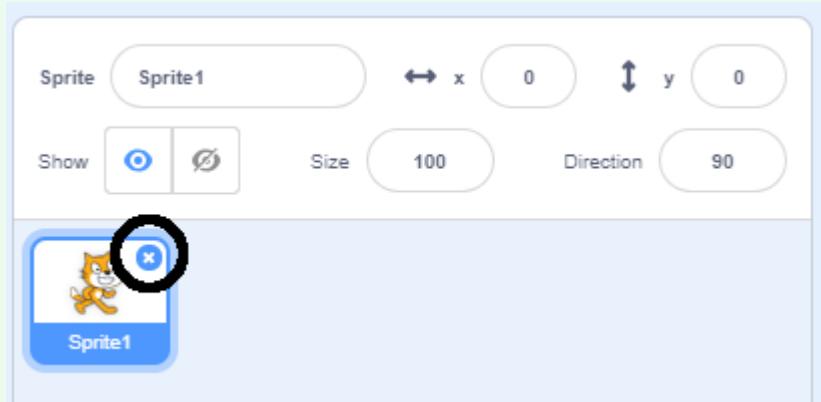
Click on the 'Stage' and then the 'Backdrops' Tab and 'Convert to Bitmap'.



Select a blue colour and the 'Fill with color' tool and then click on the backdrop.



You're going to use a different cat sprite so click on the cross on the walking cat to delete it.



Choose the `Cat Flying` sprite from the library and add it to your project.



Add a sprite from the Sprite Library



The flying cat looks like it could be swimming.

Now let's get the cat swimming.



Select the 'Cat flying' sprite, click 'Code' and add the code to make the cat rotate left and right when you press the left and right arrow keys.



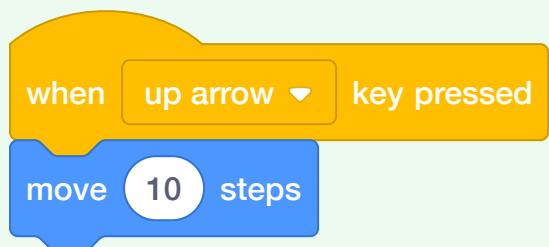
```
when left arrow key pressed
  turn (15 degrees)
```

```
when right arrow key pressed
  turn (15 degrees)
```

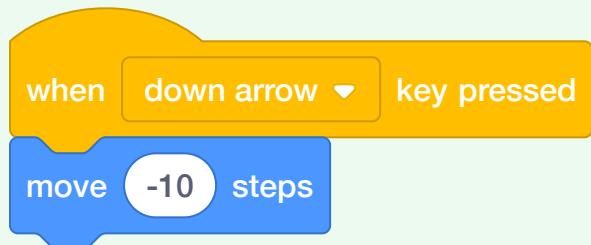
Test your code by pressing the left and right arrow keys on the keyboard.



And add the code for the forward and backward movement.



```
when up arrow key pressed
  move (10) steps
```



```
when down arrow key pressed
  move (-10) steps
```

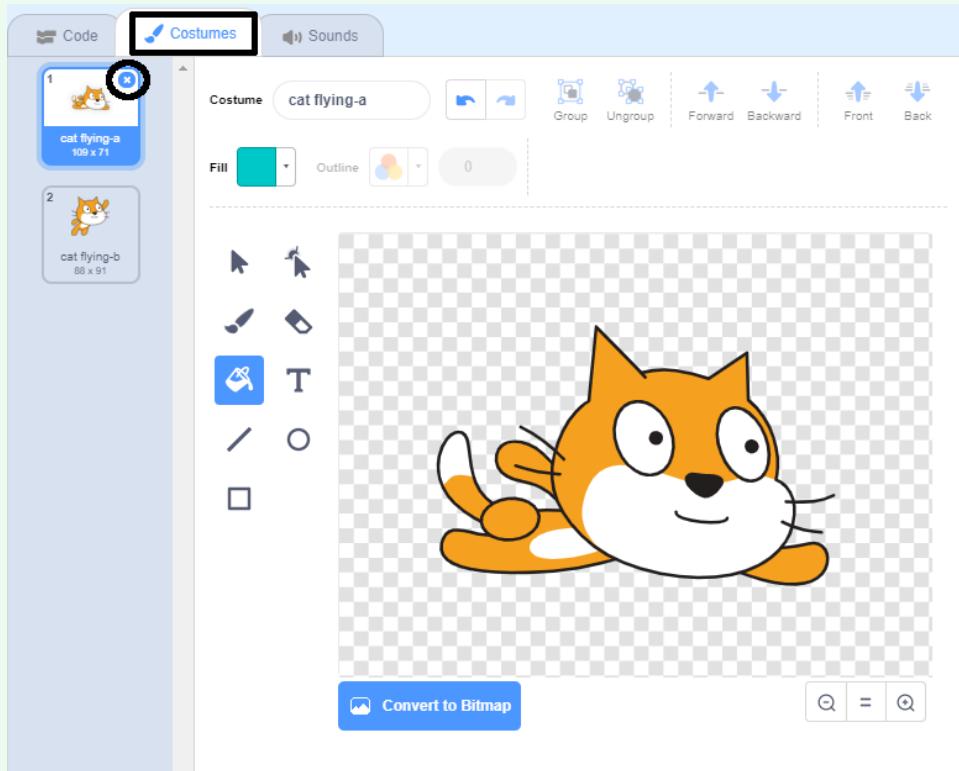
Test your code by swimming around the stage using the arrow keys.



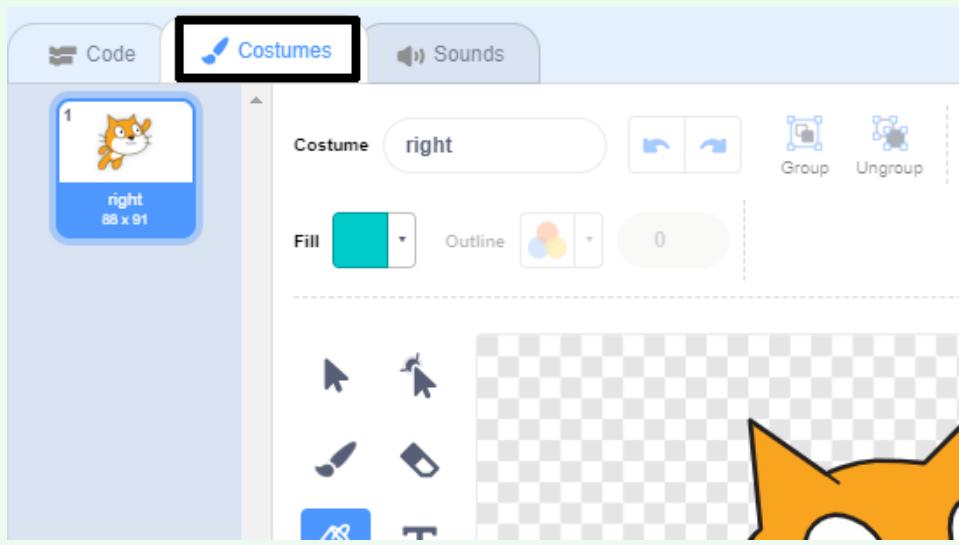
Step 3 Changing costume

Hmm, this would look better if the cat sprite changed direction when it turns left.

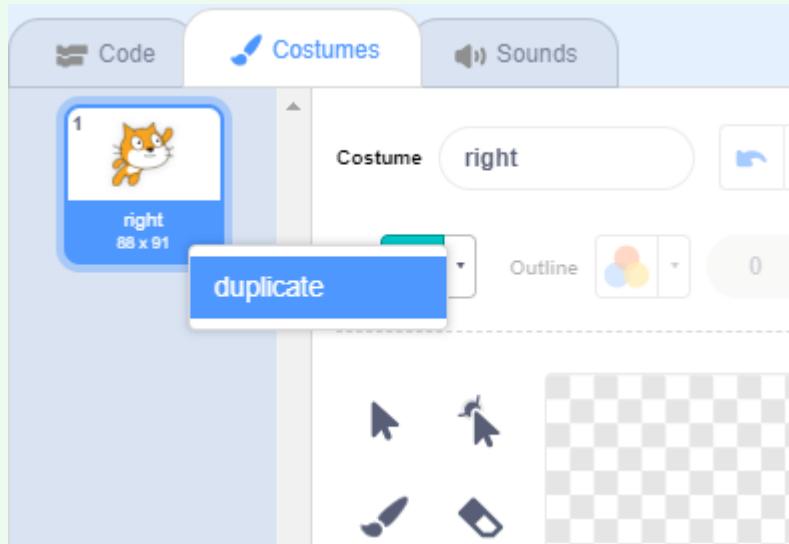
Click on 'Costumes' and delete the 'cat flying-a' costume.



Rename the remaining costume from 'cat flying-b' to 'right'.



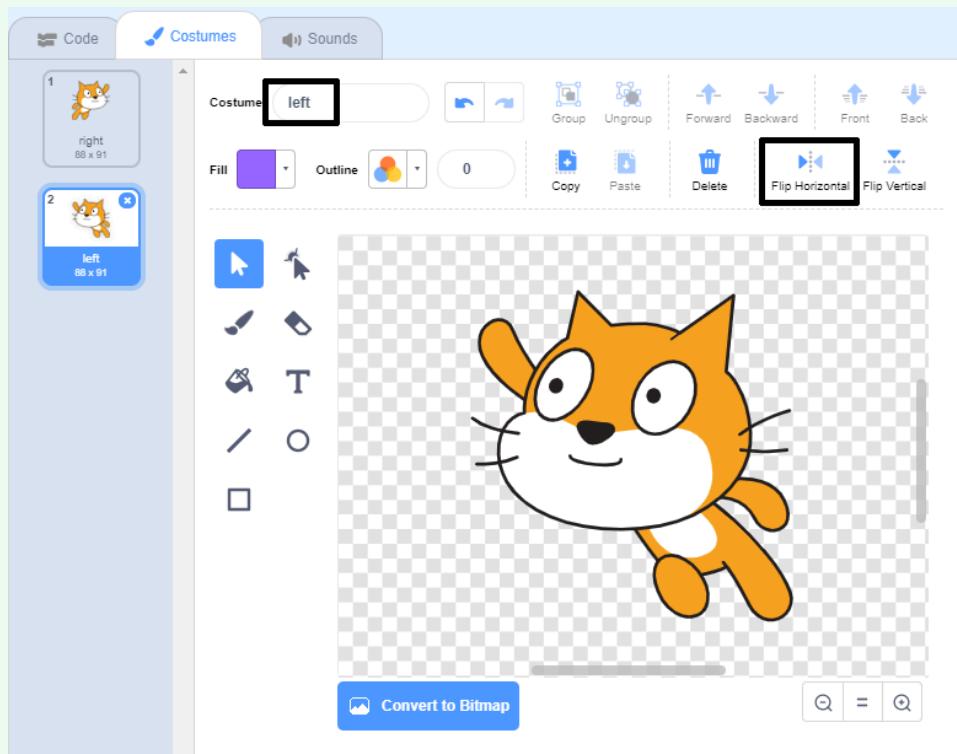
Right-click on the costume and choose duplicate to create a copy.



Click 'Flip Horizontal' to reverse the copy and then name it 'left'.



Your costumes should look like this:



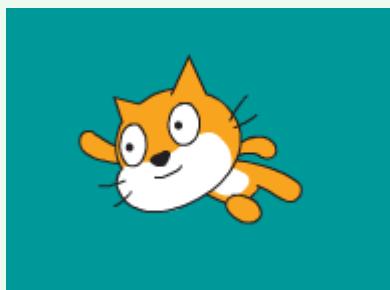
Click 'Code' to return to your code and add blocks to change the costume when the direction is changed.



```
when left arrow key pressed
  switch costume to left
  turn 15 degrees
```

```
when right arrow key pressed
  switch costume to right
  turn 15 degrees
```

Test your code by swimming around the stage using the arrow keys.



Step 4 Create the team

Synchronised swimming needs more than one cat! We can use `create clone of` to create copies that behave in the same way.

First let's add code to make sure the cat always starts in the same position when you click the green flag.



```
when green flag clicked
  go to x: 0 y: 0
  point in direction 90
```

Test your code by pressing some arrow keys and then clicking the green flag to return to the start position.



Now we can use a **repeat** loop to create 6 clones (copies) of the cat.



```
when green flag clicked
  go to x: 0 y: 0
  point in direction 90
  repeat (6)
    create clone of myself
```

Loops are used to do the same thing multiple times.

You don't want all the cats to be in the same position!

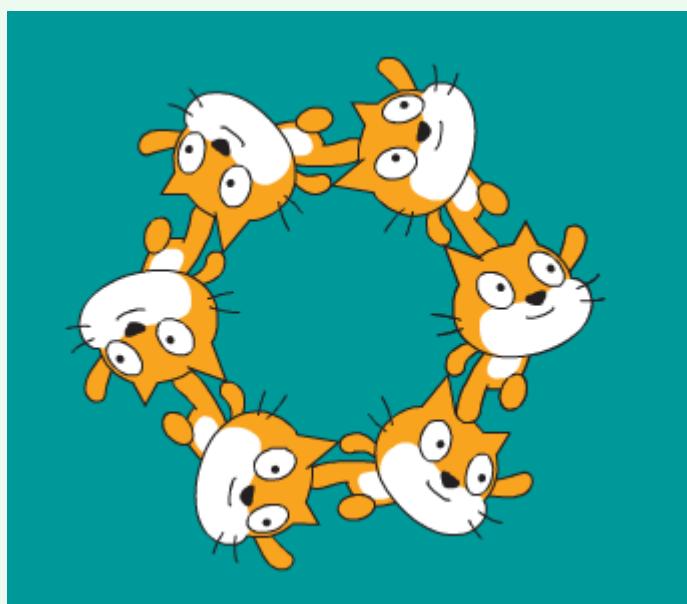


Add code to rotate 60 degrees before creating each clone.



```
when green flag clicked
  go to x: 0 y: 0
  point in direction 90
  repeat (6)
    turn (60) degrees
    create clone of [myself]
  end
```

Test your code by using the arrow keys. You should be able to create some amazing synchronised swimming patterns!



Step 5 Music!

A synchronised swimming routine needs music. (But, if you can't play sound then you can skip this step.)

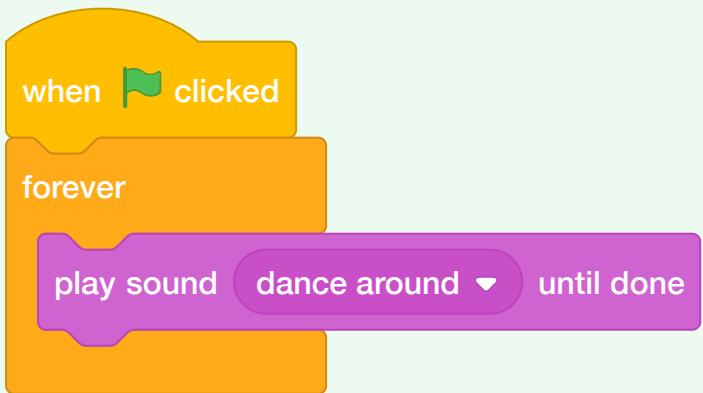
Choose a sound from the Loops category and add it to your sprite.

i Adding a sound from the library

+

The image shows a mobile-style interface for selecting sounds. At the top, there's a back button and a search bar. Below that is a navigation bar with buttons for 'All', 'Animals', 'Effects', 'Loops' (which is highlighted in orange), and 'Notes'. The main area displays a grid of sound samples. Each sample consists of a speaker icon and a name. The 'Loops' category contains the following sounds: Bossa Nova, Cave, Chill, Classical Pi..., Cymbal Echo, Dance Aro..., Dance Cel..., and Dance Chill... . The 'Dance Aro...' sound is highlighted with a blue border.

Now go back to 'Code' and add the blocks to play your music:



The image shows a Scratch script. It begins with a 'when green flag clicked' hat block, followed by a 'forever' control block. Inside the 'forever' loop is a 'play sound [dance around v] until done' sound block. The 'dance around' sound is selected, indicated by a blue border around its name.

Putting the `play sound` inside a `forever` loop means the music will keep repeating.

Test your project.

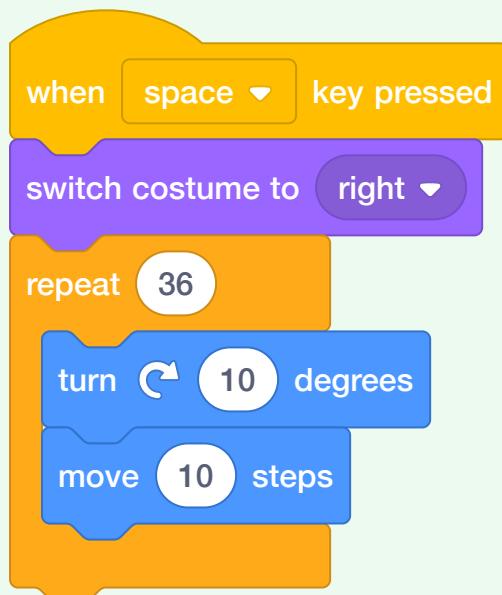


You can click on the red stop button to stop the music playing!

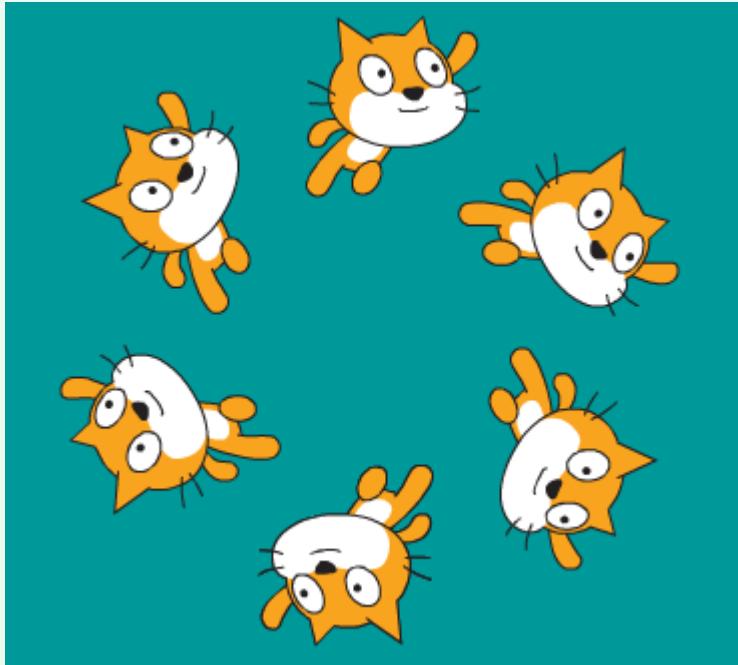
Step 6 Programmed routines

Would you like to be able to perfect a routine and easily repeat it?

Let's add some moves to be performed when the space key is pressed.



Run your project and press the space key to test the new routine.



Try using the arrow keys to move to a different position before pressing space.



Challenge: code your own routine

Can you write your own synchronised swimming routine to be performed when you press the space key or another key?

Try working out a routine using the arrow keys first.

Use **repeat** loops to perform the same actions multiple times.

Here's an example:

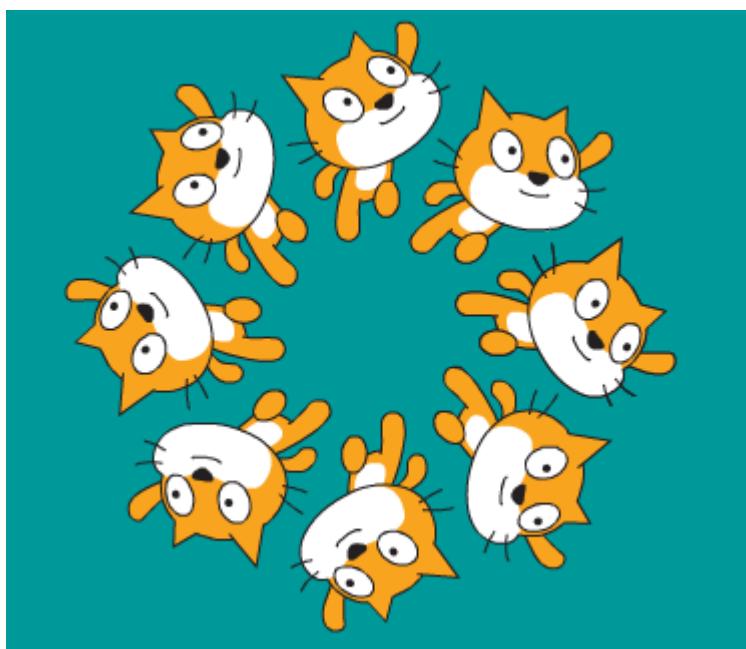


```
when m key pressed
repeat (8)
  turn (45) degrees
repeat (20)
  move (5) steps
repeat (20)
  move (-5) steps
```

Challenge!

Challenge: change the team

Can you change the number of swimmers in the team? Synchronised swimming teams usually have eight members but can have as few as four.





I need a hint



You could also change the sprite that you use.

Published by <https://www.raspberrypi.org> under a
<https://creativecommons.org/licenses/by-sa/4.0/>.
<https://github.com/RaspberryPiLearning/synchronised-swimming>.

Published by Raspberry Pi Foundation (<https://www.raspberrypi.org>) under a Creative Commons license (<https://creativecommons.org/licenses/by-sa/4.0/>).

View project & license on GitHub (<https://github.com/RaspberryPiLearning/synchronised-swimming>).

Accessibility (<https://www.raspberrypi.org/accessibility/>).

Cookies Policy (<https://www.raspberrypi.org/cookies/>).

Privacy Policy (<https://www.raspberrypi.org/privacy/>).

Translate for us (</en/projects/translating-for-raspberry-pi>).