Getting Started with Scratch!

Scratch is a fantastic way to get started developing videogames! It is brilliant for getting into programming in a fun, creative way. Head to the website **scratch.mit.edu** to get started!

Step 1: Scratch Editor and Getting Started

This is the **Sprite List.** Any sprites you add will appear here.

This is the **preview** of your game and where you can find your sprites.

Down here you can add a **sprite** and change the **background**.

This section has all the **code blocks** you'll need to make your game happen!

This is the **Coding Area**, where you drag and order all your code blocks.

We'll start by making Pong, a classic game which needs three game objects (two balls and a paddle) and both players have to try and not let the ball pass them.

Pong, 1972

Step 2: Adding New Sprites

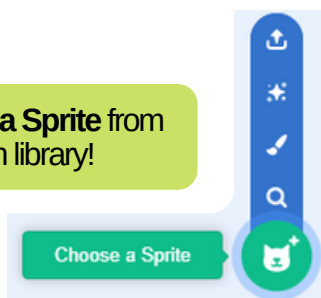A sprite is something in your game that you can code, so let's add some sprites!

1. Start by deleting Scratchy the Cat. Click the little bin next to the cat under the preview screen!

2. Find the **Choose a Sprite** button in the bottom right corner!
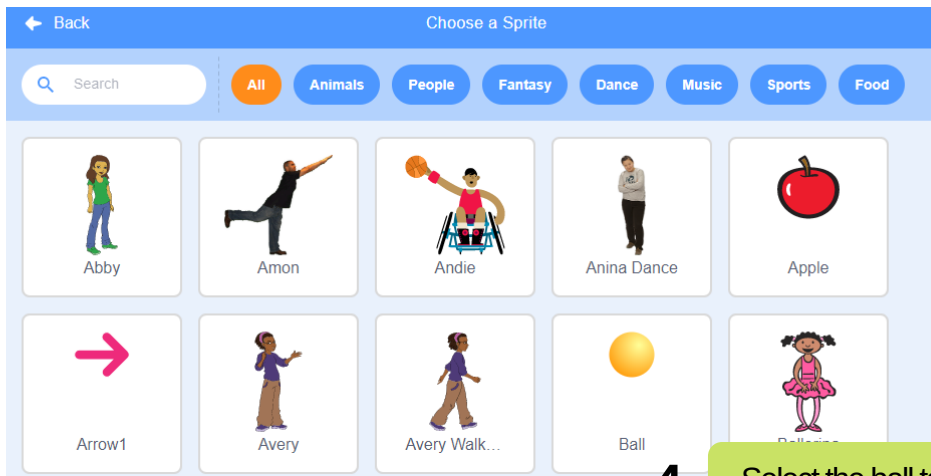
3. Select **Choose a Sprite** from the scratch library!

Top Tip!

To make Pong, we're going to chose the sprite we want, but there are other options here too. You can add a surprise sprite, or even draw your own!

This is the **Sprite Library**. You can select any sprite you like from here when making a game!

Choose a Sprite

← Back

🔍 Search | All | Animals | People | Fantasy | Dance | Music | Sports | Food

Abby | Amon | Andie | Anina Dance | Apple

Arrow1 | Avery | Avery Walk... | Ball | Ballerina

A sprite it something that appears in your game. For Pong we will need three sprites - 2 paddles and 1 ball!

4. Select the ball to add it to your game!

Step 3: Getting the Ball Bouncing!

Well done! The first thing we need to program is the ball bouncing across the screen. Click on your ball sprite! Look under 'Events' and 'Controls', click and drag the blocks outlined below over to the middle of the screen!

We will be using the **Motion**, **Events** and **Controls** sections of code to make our ball move!

Code | Costumes | Sound

Motion

Motion
Looks
Events
Control
Sensing
Operators
Variables
My Blocks

move 10 steps
turn ↻ 15 degrees
turn ↺ 15 degrees
go to random position ▼
go to x: 45 y: 9
glide 1 secs to random position ▼
glide 1 secs to x: 45 y: 9
point in direction 90

1. Select **Events** and find **When Flag Clicked** block, click and drag this into the coding area. This is the start of our coding!

when 🚩 clicked

2. Next, find the **Forever** block in the **Control** section and drag this into the coding area. Any coding blocks you add to the forever block will keep repeating forever!

forever

3. Now select the **Motion** section to reveal the motion blocks, we need some blocks from here to make the sprite move.

Find the **Point in Direction (90)** block and add this under your first block. This block controls which direction that the sprite moves.

when 🚩 clicked
point in direction 90
forever
move 10 steps
if on edge, bounce
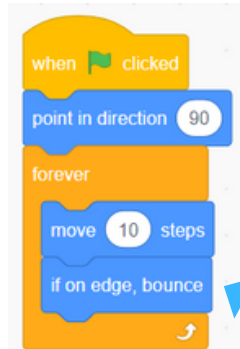
Now we need to add motion blocks into the **Forever** block, so they repeat. Add **Move (10) Steps** and **If on Edge, Bounce** blocks, like so!

The National Videogame Museum, Charity No. 1183530

4. Finally, we need to change the direction the sprite will move! We can decide this by changing the number on the **Point in Direction** block from **90** to **5.** It should look like this!
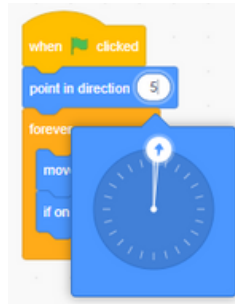
Top Tip!

Test out your coding as you go! Select the Green Flag at the top the preview area to see how the sprite is moving.

Step 4: Adding Movement & Keyboard Inputs

Next we need to add the paddles to the game and decide how players will control them. In pong, players control these paddles to hit the ball back and forth. If you miss the other player gets a point!

1. Click add sprite again, and search for **paddle** and add one to your game.
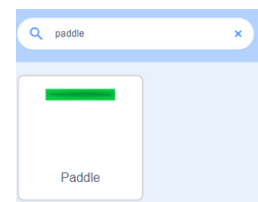
Your paddle might be horizontal like so right now, so we need to change!
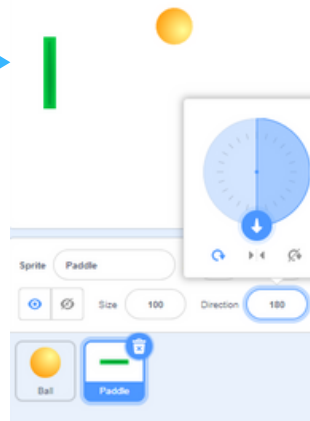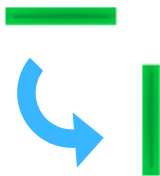
Select the Direction under the preview screen and change this from 90 to **180**. This will make the paddle vertical, like so!

Next, click on the paddle on the preview screen and drag it over to the left side!

Now we need to get the paddle moving. Unlike the ball, we want to control when and how the paddles move. Make sure the paddle sprite is selected so we can start a new section of code. You won't lose the work you've done so far, don't worry!

2. Select the sprite you want to get moving (in this case the paddle) then select **Events** and find **When Flag Clicked** block again. Click and drag this into the coding area.
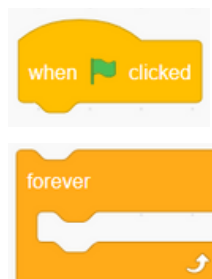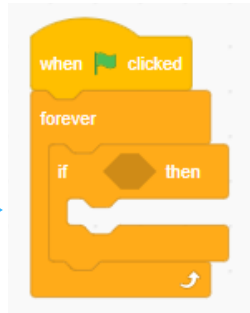
3. Next, select **Control** again add another **Forever** block.

4. Now we need a new block! In the **Control** section you should find a **If _____ then** block. It looks a bit like the **Forever** block but there is an extra gap to add another block. We'll need this to add a keyboard input so we can control the paddle.

5. Drag the **If _____ then** block inside the **Forever** block. So far your code should look like this!

6. Look in **Sensing** section and find **Key _____ Pressed?** block. Drag it into the coding area and change the option space to say **'Down Arrow'.**

7. Drag this into blank hexagon in the **If _____ then** block, so it looks like this!

Now we've added the keyboard input (pressing the down arrow), we need to decide how the paddle will move when the down arrow is pressed!

8. Select **Motion** and find the **Change y by 10** block and drag it into remaining space in the **If _____ then** block.
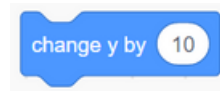
As we have selected the 'down arrow' input, we want the paddle to move down when that is pressed! Otherwise it might get a bit confusing...

This block will make the sprite move along the y axis (up or down vertically). To decide whether it goes up or down, we need to change the number in this block.

If you're not sure what this means take a look at this graph! We want the paddle to move down so we need a negative number.

Y+

X−   X+

Y−
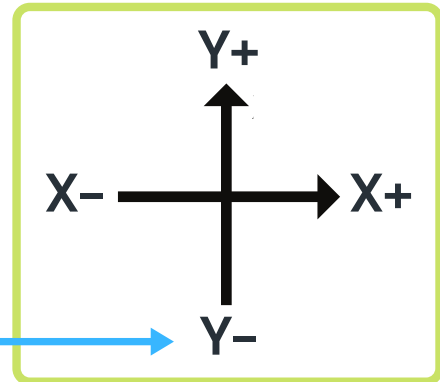
9. To make the paddle move down when we press the down arrow, change **10** to **- 10** in the **Change y by 10** block.
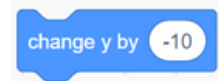
This is what we should have so far, click the green flag and test it by pressing the down arrow on your keyboard.

You might have noticed there is a little problem... we can't make the paddle move back up again! To fix this we need to copy what we have just done but make some slight changes!
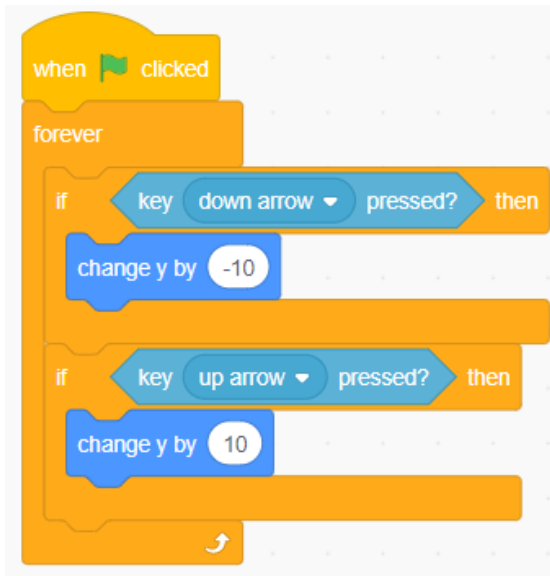
10. Add another **If ____then** block under the first one, making sure it is still inside the **Forever** block.

11. Next add the **Key ____ Pressed?** and change the input to **Up Arrow.**

12. Nearly there! Lastly, add another **Change y by 10** block, making sure the number is set to 10!

Great work! We should now be able to control our paddle which will be very useful for playing pong. Altogether it should look like this!

Step 5: Duplicating a Sprite

So that we can play with a friend, we need to add another paddle. We could repeat everything we've done in Step 4 or we could just copy it!

1. Right click on the **Paddle Sprite** in your **Sprite List** and select **duplicate**. This will copy the sprite and all your programming.
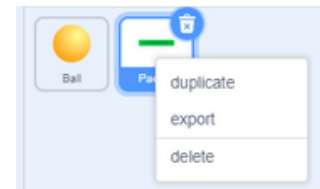
We will need to change the keyboard inputs on the second paddle, or up and down will control both paddles! Here we will use the **W** and **S** inputs so two people can play using one keyboard.

2. Change the **Key ____ Pressed?** block inputs so that **S** replaces **Down Arrow** and **W** replaces **Up Arrow**.

Click the green flag and test both the paddles to make sure everything is working well so far.
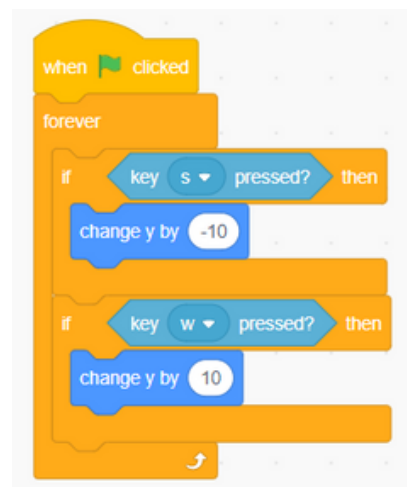
We are nearly there! You can do it!

Step 6: Collision Detection

Great work, we now have all the sprites we need and we are nearly finished! There is only one small problem, the ball floats straight through the paddles... We need to change this!

To do so, we need to add a few more coding blocks to the ball sprite, so select the ball sprite and add in the following blocks...

1. Add an **If ____ Then** block inside the Forever block like so. We'll need to add two, one for each paddle!

2. Select **Sensing** and find the **Touching ____ ?** block, add this into the **If ____ Then** block. Here we can select the two paddle sprites, so the ball sprite will recognise them and bounce off! They should say **Touching Paddle ?** and **Touching Paddle2 ?**.

3. Finally, select **Motion** and find the **Turn 15 Degrees** block, add this inside the **If ____ Then** block. Change the number on both to **90**, that way the ball will bounce off in the opposite direction!
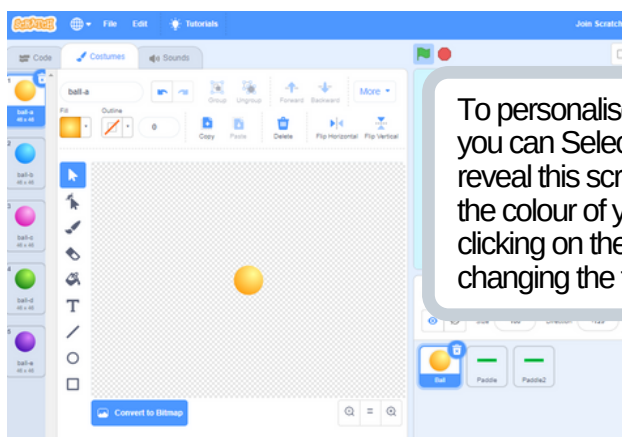
Now you should notice the ball bouncing off the paddles. We now have a working game of Pong!

Step 7: Changing Colour and Background

Well done! You should now have a working videogame! If you like, you can now change the colour and background to personalise your game.

To personalise your sprites you can Select '**Costumes**' to reveal this screen. Change the colour of your sprites by clicking on the sprite and changing the fill colour!
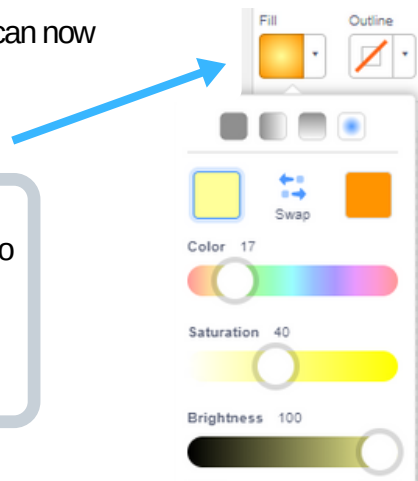
You can also find the '**Choose a Backdrop**' button in the bottom right hand side!

Well done, you are finished! Test out your game with another player and see what else you can create!