

Phoenix

You will need:

Access to the [Scratch](#) website, from a computer or laptop.
(It might also work from an ipad or tablet)

This tutorial is best for people who have used Scratch a little bit before.

Setup:

If you haven't used Scratch before, click join scratch at the top and create an account. You might need your parent's email to do this, so ask for help. If you can't make an account, you can follow along, but you won't be able to save your work.

Once you've made an account follow the Phoenix Scratch studio [here](#). This is where you can find the template versions of all the workshops we create. Feel free to remix them and post the new things you create.

Wait, what is Scratch?

Scratch is a free, online, **block-based** code editor. You might have used it in school. If you've been to one of our family workshops, you've probably seen us using it there.

There are lots of different tutorials available for using Scratch. Here we are going to focus on showing you ways of using Scratch that link to the work we do at Phoenix. This will include things like animation and drawing.

Bridge Designer

In this project we are going to create a game that people can play with. There are lots of games like this. Lemmings is a particularly famous one!

Have a look at the finished project here,
<https://scratch.mit.edu/projects/389406089/>

And then open this project and remix it.
<https://scratch.mit.edu/projects/389335182/>

Step 1

First of all we need to identify the different things we need our project to do. This will allow us to focus on the essential parts of the project, and make something that works:

-We need our player to be able to draw bridges on to the scene.

-We need a starting point, and an ending point.

-We need something to walk across the bridges.

These seem to be the most important parts. Whilst we're working on these, let's also try to think about some bonus objectives:

-Scoring points.

-Different levels.

Step 2

Ok, let's start with some kind of system to let the player draw on the scene.

Make sure you have the pen extension, added to the project.

Set up a sprite that you will use as the bridge drawing pen. We have drawn our own and called it Pen.

Attach some code blocks, so that you have something like this.



Let's discuss what's happening here.

We set up the pen, with the size and colour.

And then, **forever**, we check for the space key being pressed. When it's pressed we will move the pen sprite to the cursor. It will keep trying to move to the cursor until the space key is released.

Experiment with this and see what you think works best. Perhaps you would like to use a different colour or key.

Can you think of another way of moving the pen around?

Step 3

So now we can draw our bridges. But we don't have anything to draw them between or anything to walk across them.

We've used a new sprite called Scenery to be the points that we connect the bridge between.

Make sure you make any surfaces that you want to be solid, the same colour as the bridge pen.

You can draw a few different costumes for the scenery Sprite if you like. You might also like to draw these as costumes for the background instead.

Now is a good time to set up our starting point and endpoint.

We've called our Start and Goal. Make sure they're visible and move them to a location that makes sense for your scene.

Step 4

With that sorted, let's have a look at the Cat sprite. This is the one we are using to cross the bridges.

You could use any sprite you like.

This is the first part of code for our Cat.

So you can see that we move the Cat to wherever our Start sprite is placed.

We then start making clones of the Cat to do the walking.

The `rotation style` block is used because this allows us to flip the sprite left and right, rather than spinning around in a circle.

Step 5

Now we'll have a look at the code for the clone of the Cat.

This is our simplified version of the code. Let's go through it step by step.

Our first challenge is to make the Cat 'fall' until it hits a surface. We do this by using the `repeat until` block. We set the `touching color` block to our Pen colour.

Now we adjust our Cat position until it reaches a surface.

Next we start to move the Cat. here we simply have it set as `move 2 steps`. You could try the code with just this section if you like.

You might have found that sometimes the Cat is dropping below the surface. To help with this we have the next part of code. After moving along a bit we move the Cat back up a little bit, `change y by 2`. Doing this means that our Cat shouldn't be able to get through the lines we make.

We've used the same idea to build a way of checking for walls.

If the Cat has moved, and been lifted up, but they are still touching the pen colour, they must be hitting a wall or a steep slope. So now we **change x by -3**.

We then change the direction of the Cat so that it will walk away from the wall.

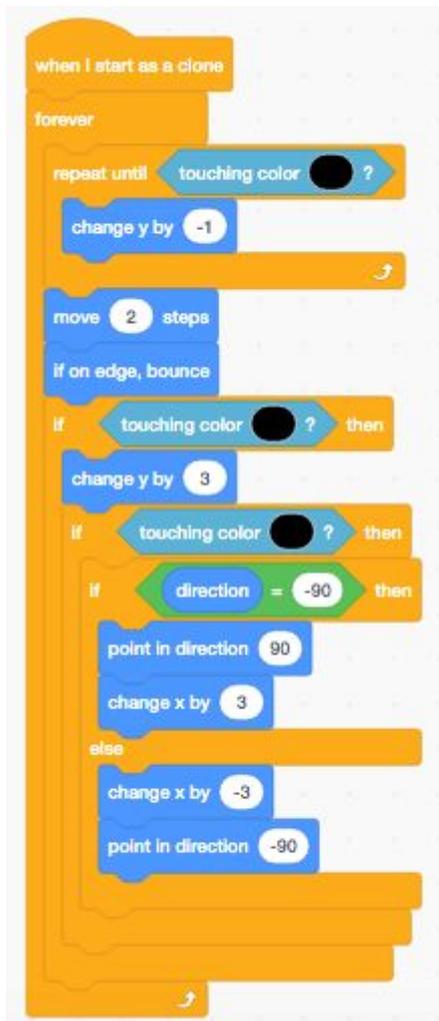
Can you see what the problems might be with this code?

Can you adjust it so that the Cat can walk up steeper slopes?

Step 6

One problem you might have found is that the Cat doesn't behave properly after it has changed direction.

In this block below we have added some extra statements to solve this. Have a go at creating your own solutions first!



Step 7

Great, with all of this in place we can really start experimenting. We just need to add one more piece of code to our Cat clone block.

And perhaps add this to your first piece of Cat code.

Now our stage hopefully won't get too filled with Cats!

Step 8

So let's have a think about scoring.

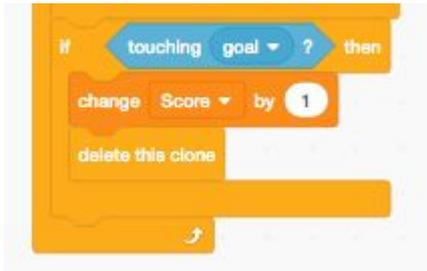
You might have guessed by now, but it's going to include variables.

We'll create a new variable called Score.

Let's have it set to reset at 0 within the Goal code.



And then switch back to our Cat and add this to count each time we a Cat reaches the goal.



Step 9

Our project should now be working quite well.

Here are some ideas for you to have a go at:

- See if you can make it more interesting by switching between different levels.
- Can you do something with the Cats that fall to the bottom of the screen?
- Can you animate the Cats?
- Can you add any fun sound effects?
- How about an option to erase the line you've drawn?
- Or what about some jump pads for the Cats?!

If you get stuck with any of these, have a look at our example project to get some hints.

Remember to share your project to the Phoenix Scratch studio!

Hopefully you found this exercise interesting! We can't wait to see what you create.

Phoenix.org.uk

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