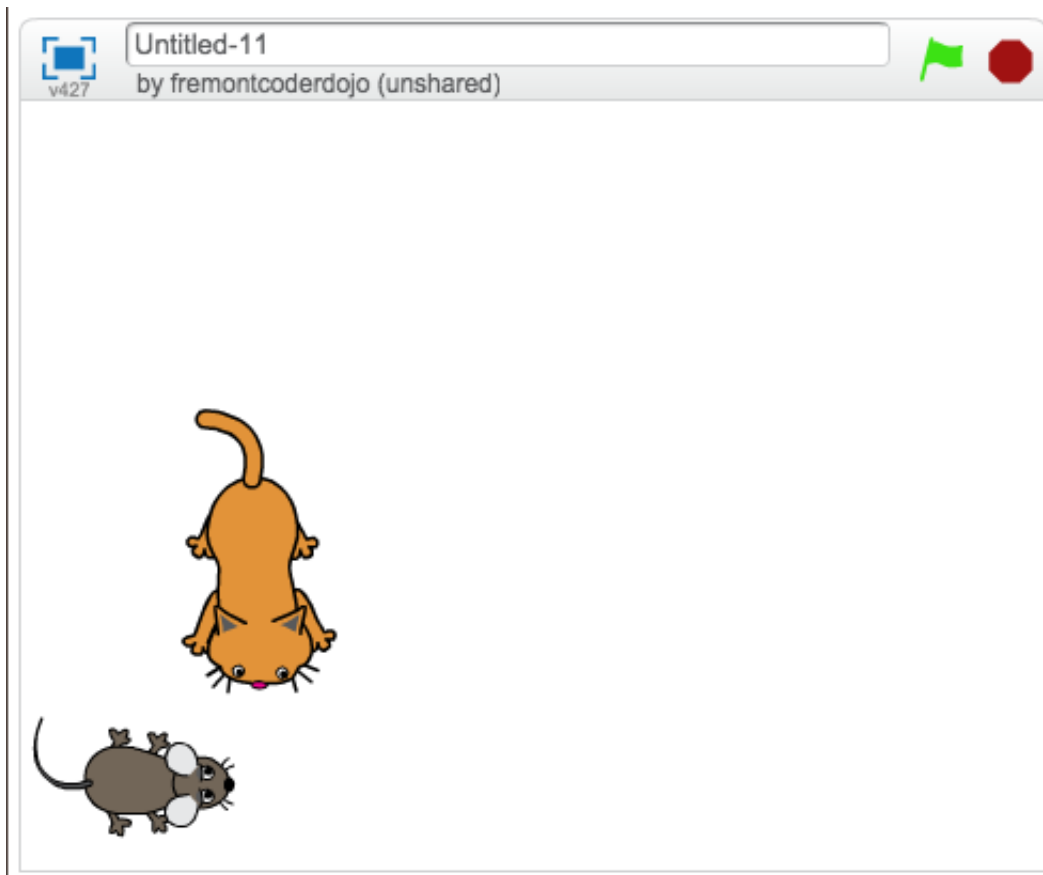# Sprite Movement and Collision Detection

You will learn the basic skills needed to create your own game! By the end you will have a cat who meows when she catches her mouse. This will probably take less than half-an-hour to complete.

Start with a new sprite

First. Create a new progect on the scratch website (http://scratch.mit.edu/projects/editor/). You might want to drag out this tutoral page and tile it alongside the scratch page so you can use both without lots of switching back and forth. It might look like this:

Right-click or control-click 'Sprite1' from the 'Sprites' window. Select 'Delete'.

Click the icon for 'Choose new sprite from library'.

Choose 'Cat2'.

Setting up defaults and the game loop

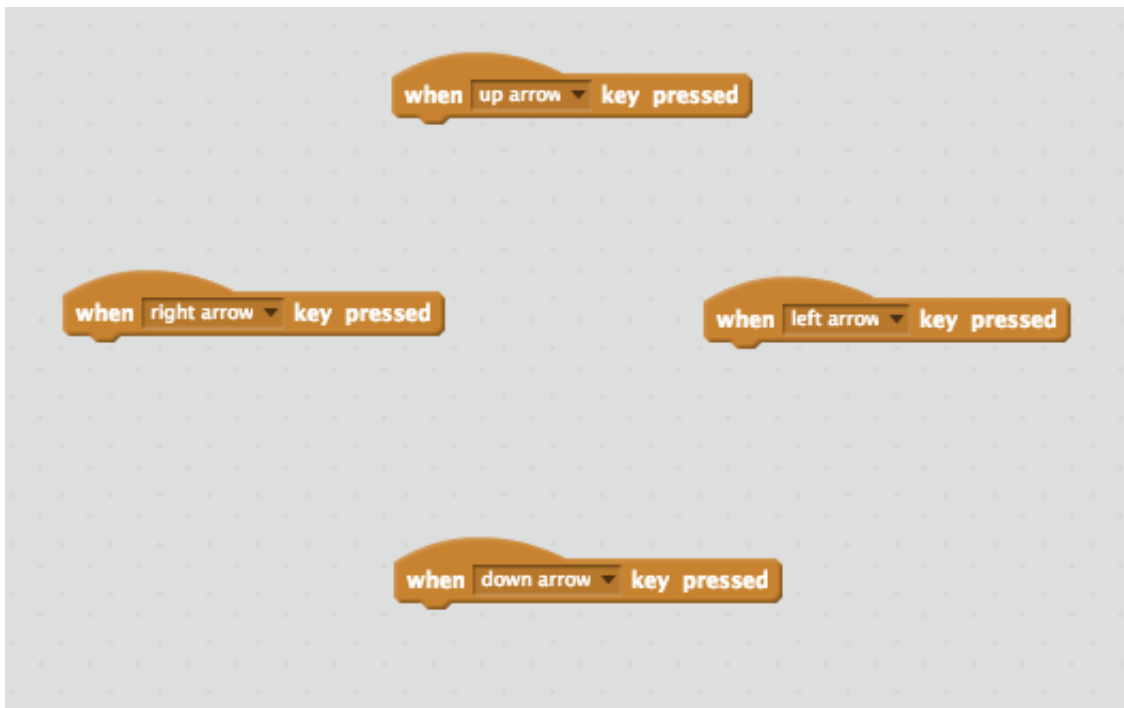Select 'Events' under the 'Scripts' tab. Drag 'when flag clicked' into the script area.

Select 'Motion'. Drag and attatch 'go to x:0 y:0'. Make sure 'x' is set to '0' and 'y' is set to '0'.

Select 'Control'. Drag and attatch the 'forever' block. This will be our game loop. We will use it later to detect collisions between sprites.
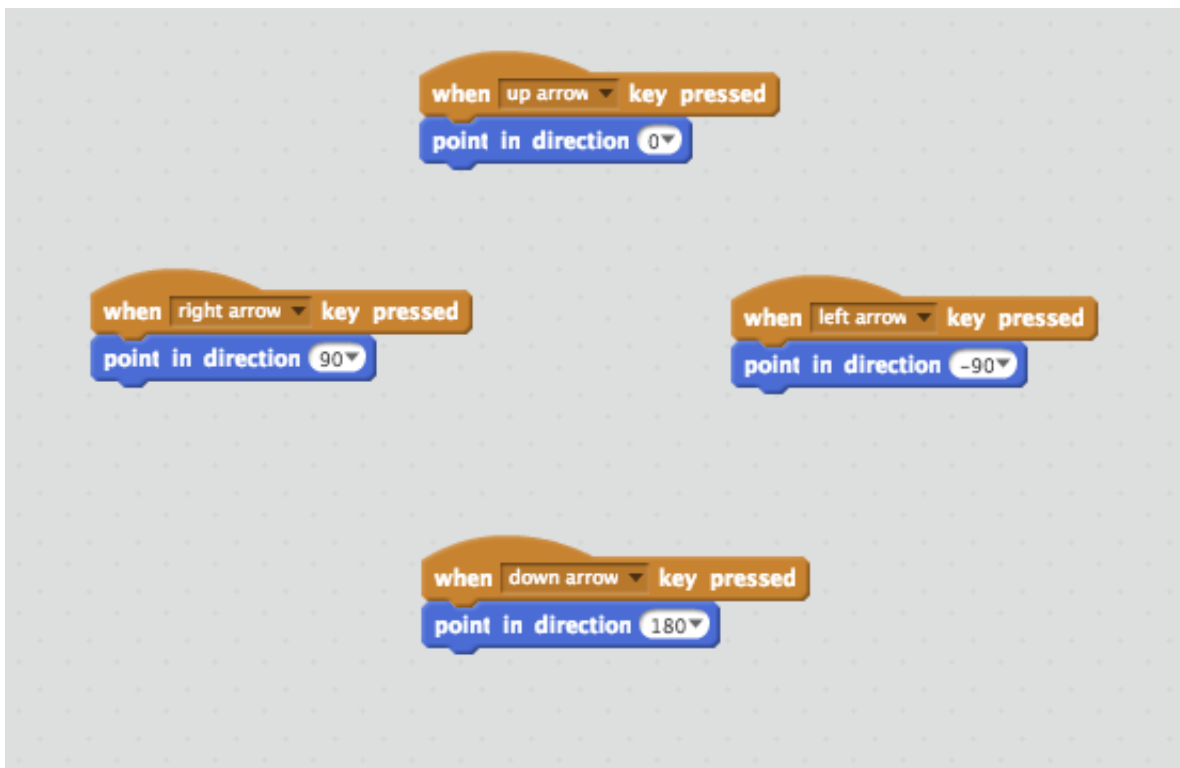

Controlling the cat sprite

Select 'Events'. Drag the 'when' space key pressed' onto our script window. Do this three more times. In each of those blocks, select the small black triangle and change 'space' to 'up arrow', 'right arrow', 'down arrow', and 'left arrow', so that it matches the image below.

when up arrow ▾ key pressed

when right arrow ▾ key pressed

when left arrow ▾ key pressed

when down arrow ▾ key pressed

Now select 'Motion'. Drag and attatch a 'point in Direction' block to each 'when _ key pressed block'.

On each, click the small black triangle and choose the direction that matches the key being detected.

when up arrow ▾ key pressed
point in direction 0▾

when right arrow ▾ key pressed
point in direction 90▾

when left arrow ▾ key pressed
point in direction -90▾

when down arrow ▾ key pressed
point in direction 180▾

Test it. Click the flag. 🚩 🛑 Press the arrow keys on your keyboard. The cat

should face in the direction of the key being pressed.

Drag and attach a 'move 10 steps' block to each of the four keypress scripts you have been building.
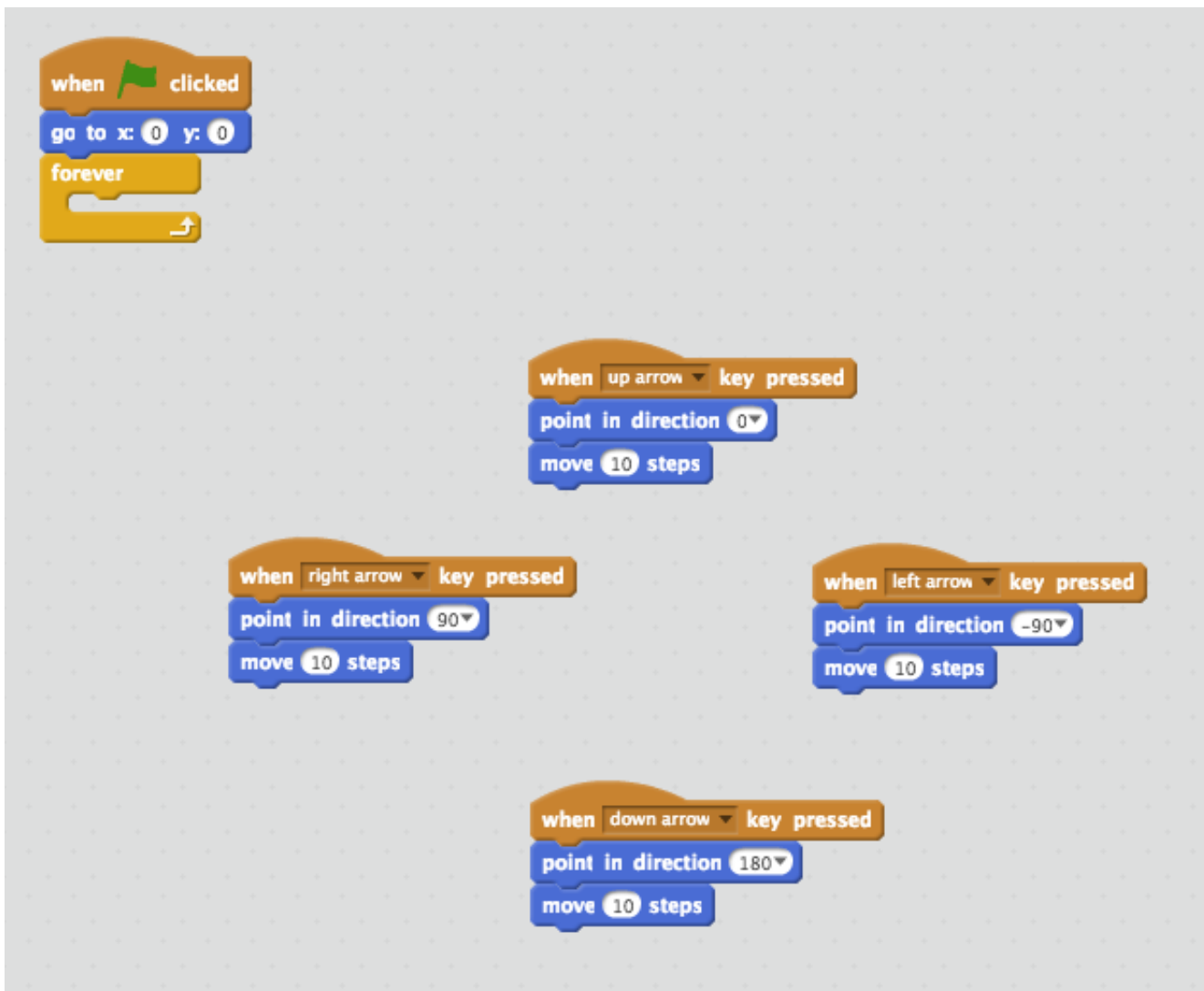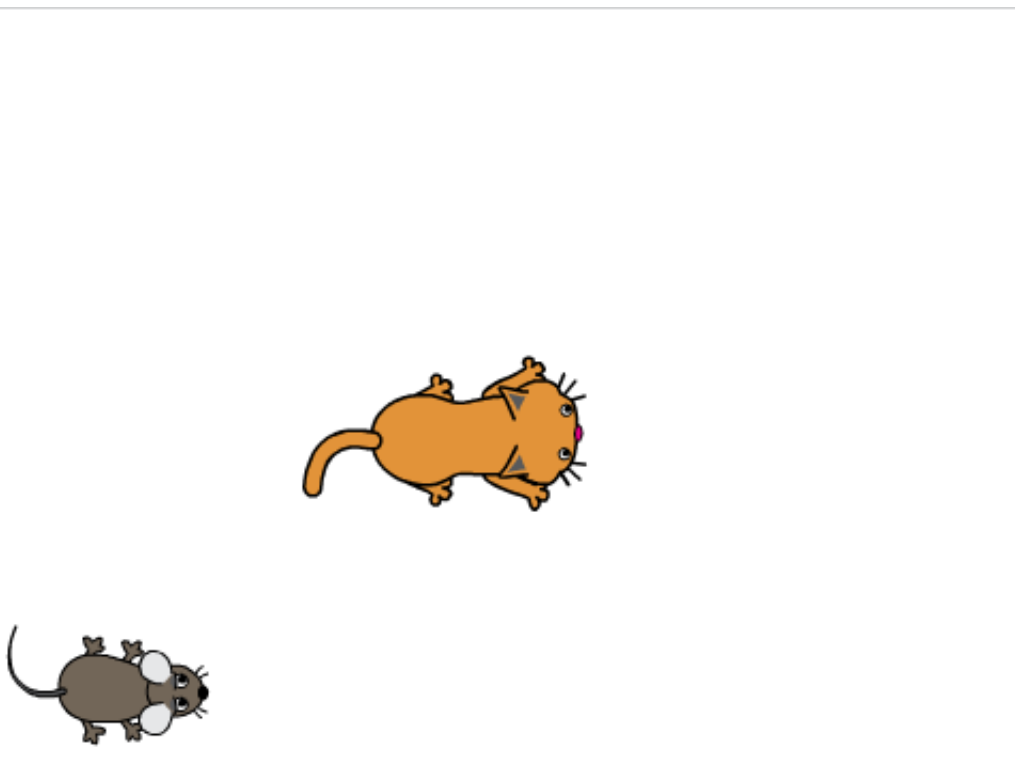

Click the flag and press your arrow keys. The cat should move across the stage!
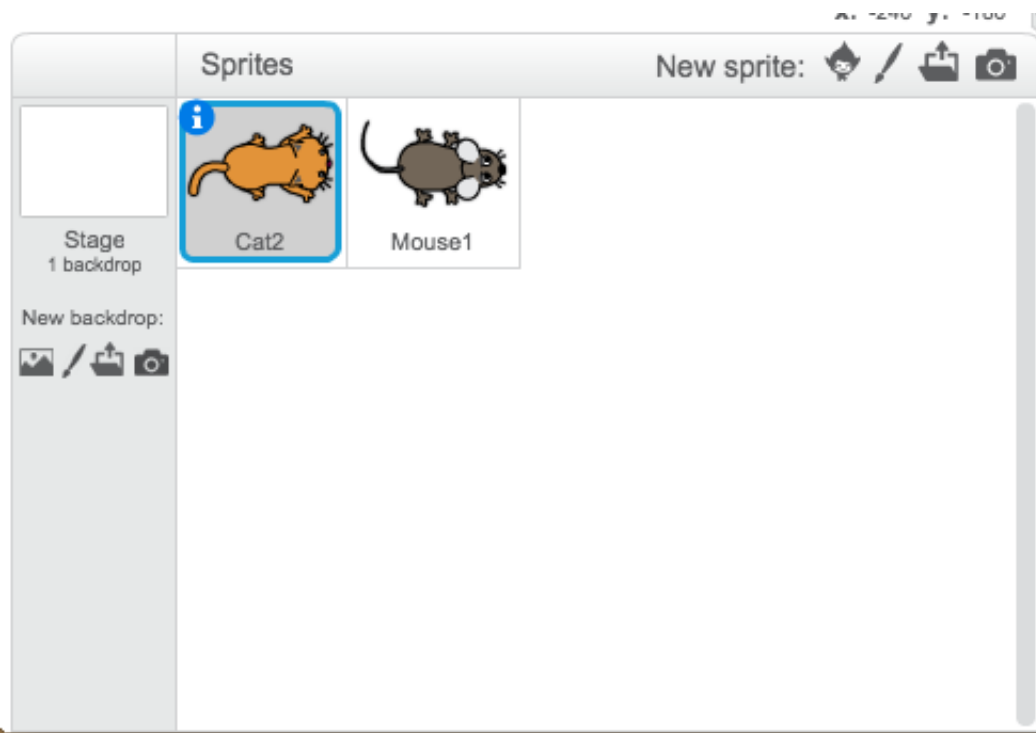
Add a mouse for your cat to catch

Select the new sprite icon.

Choose 'Mouse1'. Move it away from the cat on the stage.

Select the 'Cat2' sprite in the 'Sprites' window. Our script blocks controlling the cat will come back up in the script window.
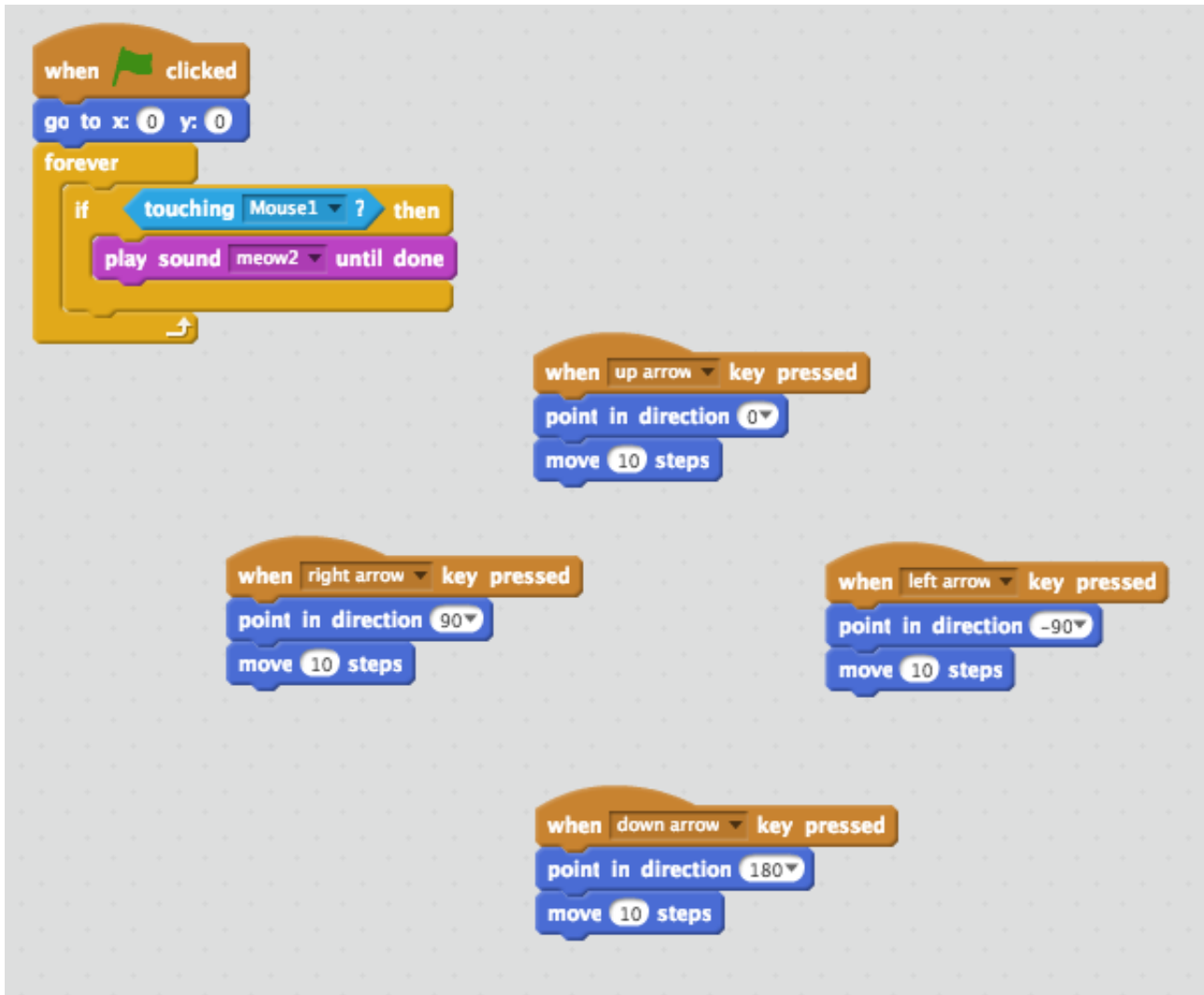

Select 'Control'. Drag an 'if then' block into the scripts area.

Select 'Sensing'. Drag a pointy 'touching?' block into the pointy container on the 'if then' block.

Select the black triangle inside the 'touching?' block. Choose 'Mouse1'.

```
if  ( touching [Mouse1 ▾] ? )  then
```
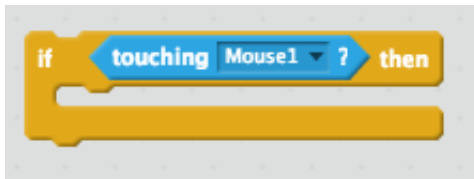
Select 'Sound'. Drag 'play sound meow2 until done' into the 'if then' block. Next, drag the whole 'if then' block into the forever loop.

```
when 🚩 clicked
go to x: 0 y: 0
forever
    if  ( touching [Mouse1 ▾] ? )  then
        play sound [meow2 ▾] until done


when [up arrow ▾] key pressed
point in direction (0▾)
move 10 steps


when [right arrow ▾] key pressed          when [left arrow ▾] key pressed
point in direction (90▾)                  point in direction (-90▾)
move 10 steps                             move 10 steps


when [down arrow ▾] key pressed
point in direction (180▾)
move 10 steps
```

Make sure your volume is up. Now click the flag and direct the cat to catch the mouse!