



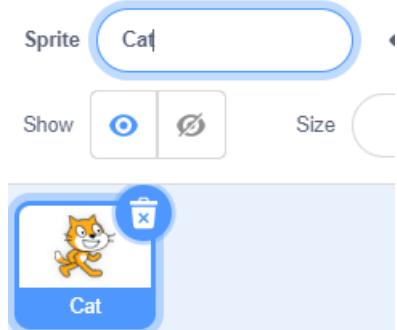
Introducing Scratch

4 – Cats & Dogs

Exercise 1. The Cat

Yep! It's time to make use of that cat you keep on seeing every time you start Scratch. We're going to make a program that allows the user to control the cat as he avoids dogs that are moving around the stage.

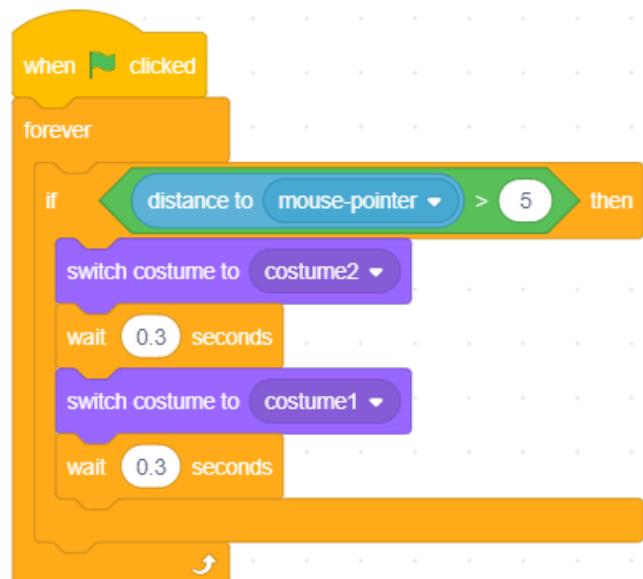
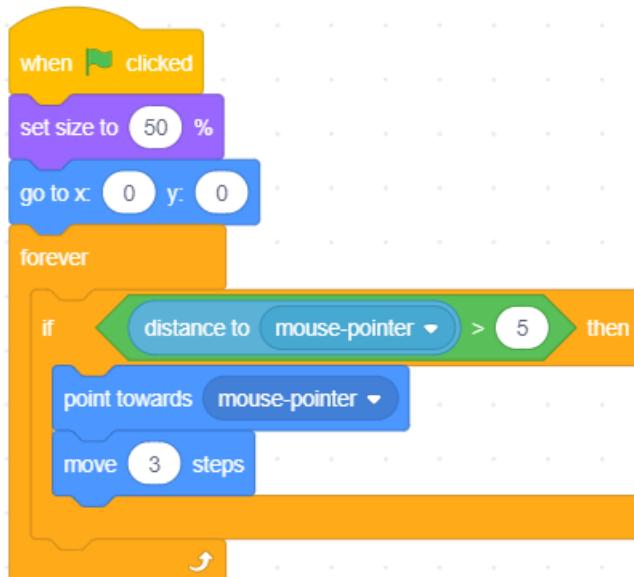
1. Start a new scratch project. Your cat should be on the **stage** as *Sprite1*.
2. Rename the sprite as *Cat*.
3. Click the **Costumes** tab. You will see that there are already two costumes for the cat. We'll use them later for animating the cat.



4. Click back on the **Code** tab.

If you've done exercise 1 and 2 you should be familiar with how to find code blocks and place them together by now.

5. Add the following program blocks to the *Cat* sprite.



The first block will resize the cat, place it in the centre of the stage and move it toward the mouse pointer if it isn't already close to it. The second block will make the cat switch between its 2 costumes when it is moving to make it look like the cat is running.

6. Save the file as *Cat and Dog*.

Exercise 2. Adding the Dog

1. Click the **Choose a sprite** button.



2. Import the picture *dog2* from the *Animals* or *all* category.



Dog2

3. Rename the sprite as *Dog*.
4. Switch to the **Costumes** tab. You will notice that this sprite comes with 3 costumes. 2 walking costumes and one in a thinking pose.
5. Return to your **Code** tab.
6. Add the following Code for the *Dog*.



The first block resizes the dog and positions it in a corner of the stage. It then begins moving the dog in random directions and turns around if it touches the edge. The other block switches between two costumes to make it look like the dog is running.



7. Try running the program to see how it all works so far. The idea will be for the user to move the cat so that it avoids the dog (later there will be more than one dog).

At the moment, nothing is happening when the cat gets caught by the dog so we need to add some code for that. We will also add a score to see how long a player can last before getting caught.

Exercise 3. Catching the Cat

1. Make sure the **Dog** sprite is still selected and click the **Sounds** tab.

When we imported the sprite it also included a sound. Like sprites and backgrounds, Scratch includes a wide range of sounds. If we wanted to use a sound that wasn't imported with the sprite, we could use the **Choose a sound** button.

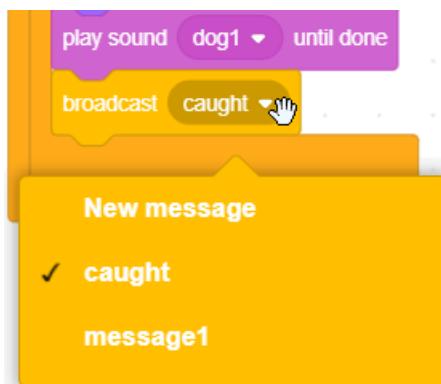


2. Click the play button  to preview the sound.
3. Return to the **Code** tab.
4. Add the following code blocks to the bottom of your first group.



Sometimes a program will need to pass information from one sprite to another. In this program, When the Dog touches the Cat, the program will need the cat sprite to do some things. This is done using broadcasts. The dog sprite will send a broadcast. The cat sprite will run some instructions when it receives that broadcast.

5. From the **Events** category, add a **broadcast** block below the last block you added.



6. From the broadcast options select new message and enter *caught* for the name of the broadcast.
7. Select the *Cat* sprite and add the following code blocks.



These blocks will stop the program when the cat is touched by the dog.

8. Test your program to see what happens now when the cat gets touched by the dog.

Exercise 4. Adding a timer.

Like our previous game, we'll use a timer to keep score. Then players of the game can see how long they can avoid the dog.

1. Click on the **stage** to the side of the **Sprite list** area.
2. Select the **Variables** category from the Code list.
3. Click **Make a Variable** and enter *Time* for the name.
4. Add the following Code blocks to the Stage.



Tip Use the colours to find which category each block comes from.

Test the program. The timer should now be ticking away until the cat is caught.

5. Save the program as *Cat and Dog*.
6. Try it out and see how long you can go without getting caught (if it's too easy try some of the suggestions on the next page to make it harder).

Exercise 5. Additional things to try

Change the backdrop of the stage to something more interesting.

Change the speed of the cat and/or dog to make it harder or easier.

Change the timer – double-click (or right click) on the timer to change the variable style.

More dogs! Right click on the dog sprite and select duplicate (rename the new sprite to something suitable). Change the first group of Code blocks for the new dog so it looks like the example below. Notice that in this example the go to block has no minus signs so this dog will start from the opposite corner. It's also got a colour effect block to make it look slightly different. Now you'll have two dogs chasing the cat from different directions. You could add more to make it even harder (try it with a dog starting in each corner).



Add a High Score – If you can't remember how to add a high score with the timer, refer to the example in the Bat Maze exercise (exercise 2). Below is an example of how it could be done (remember that in programming there is often more than one way of getting the result you need).

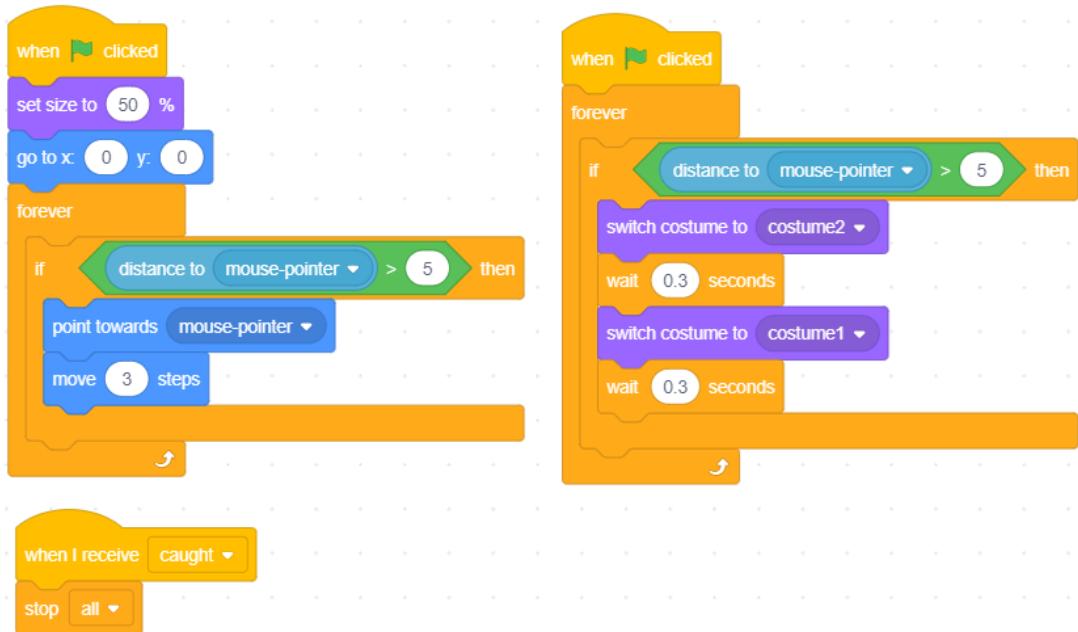


Foil the cheats - At the moment it's possible for players to cheat the game by keeping their cat in a corner where the dogs can't get them. Can you think of a way of preventing that? There's more than one way you could do it but some methods may give better results than others.



Exercise 6. Completed Code

Cat



```

when green flag clicked
  set size to (50 %)
  go to x: (0) y: (0)
  forever
    if [distance to mouse-pointer > (5) then
      point towards mouse-pointer
      move (3) steps
    ]
  end
  when I receive [caught v]
    stop [all v]

```

Dog

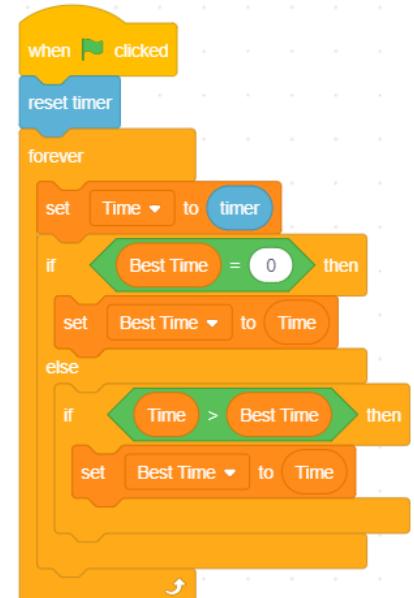


```

when green flag clicked
  set size to (40 %)
  point in direction (90)
  go to x: (-200) y: (-130)
  forever
    move (4) steps
    turn (pick random (-15) to (15)) degrees
    if on edge, bounce
    if [touching Cat? then
      switch costume to (dog2-c)
      play sound [dog1 v] until done
      broadcast [caught v]
    ]
  end

```

Stage



```

when green flag clicked
  reset timer
  forever
    set [Time v] to [timer]
    if [Best Time = (0) then
      set [Best Time v] to [Time]
    else
      if [Time > Best Time then
        set [Best Time v] to [Time]
      ]
    end
  end

```