

Scratch



Recycling

{code
club}

All Code Clubs must be registered. Registered clubs appear on the map at codeclub.org.uk - if your club is not on the map then visit jumpto.cc/18CpLPy to find out what to do.

Introduction

We're going to make a recycling game! Catch the falling items, and put them in the correct recycling bins.



Use the arrow keys to run left and right
Press space bar to throw what you're carrying
Get the rubbish in the correct recycling bin



Activity Checklist

Follow these **INSTRUCTIONS** one by one

1



Test your Project

Click on the green flag to **TEST** your code



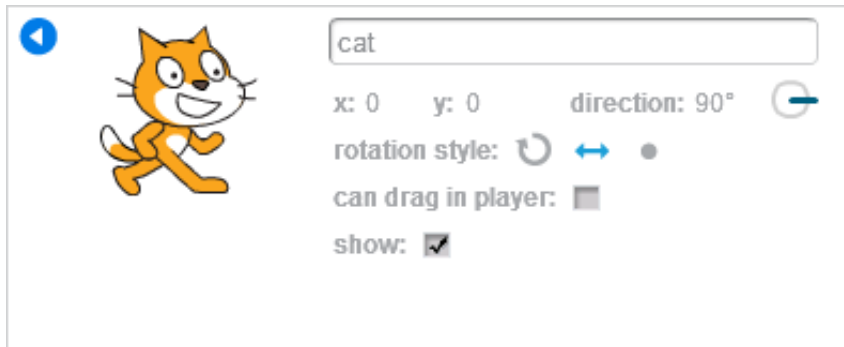
Save your Project

Make sure to **SAVE** your work now

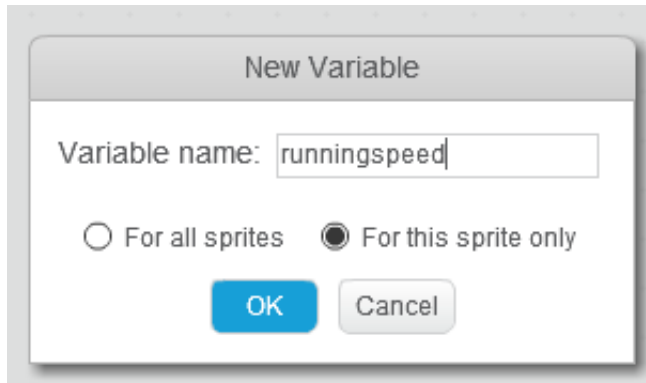
Step 1: Create the character that will pick up the rubbish

✓ Activity Checklist

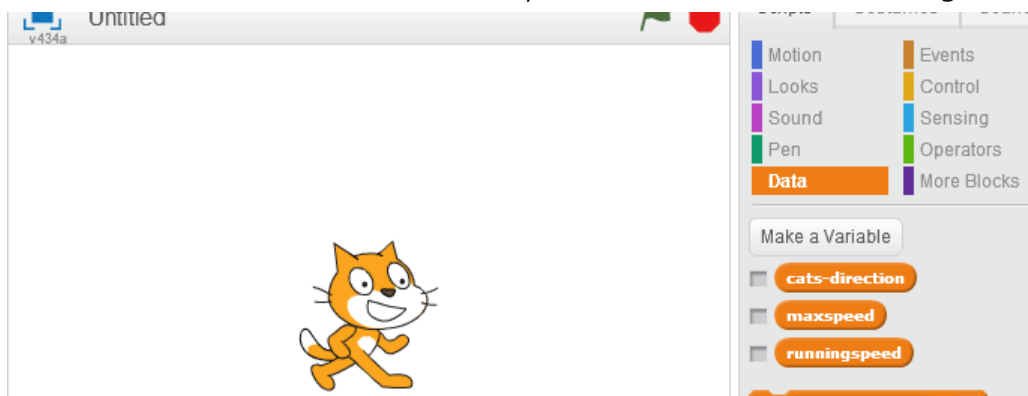
1. Start a new Scratch project.
2. Change the name of Sprite1 to cat by clicking on the blue **i** symbol
3. Make sure that it will only flip left-right with the side-to-side arrow.



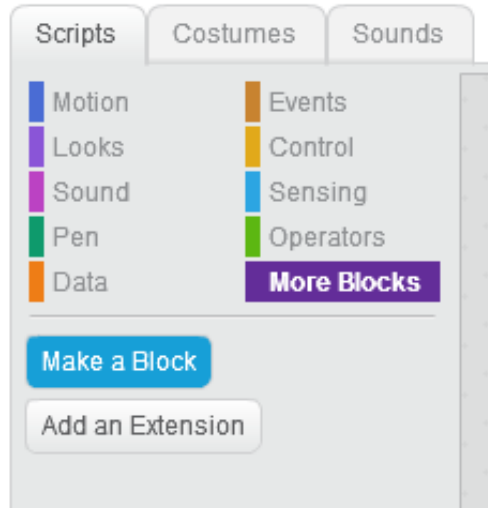
4. Create a variable, for this sprite only, called runningspeed



5. Create a variable, for this sprite only, called maxspeed
6. Create a variable, for this sprite only, called cats-direction
7. Untick all three variables so they're not shown on the Stage



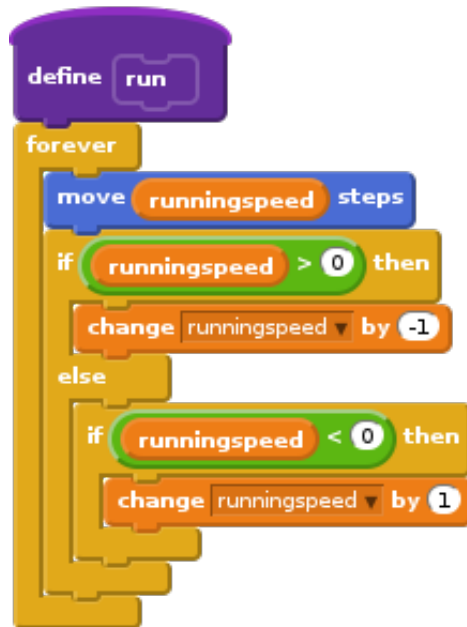
8. Use the Make a Block button in More Blocks to create a new custom block



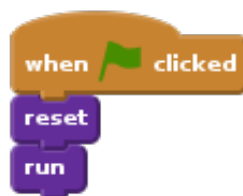
9. Name the new custom block reset
10. Add a script to the reset block that will put the cat in the right starting place and set the speed variables



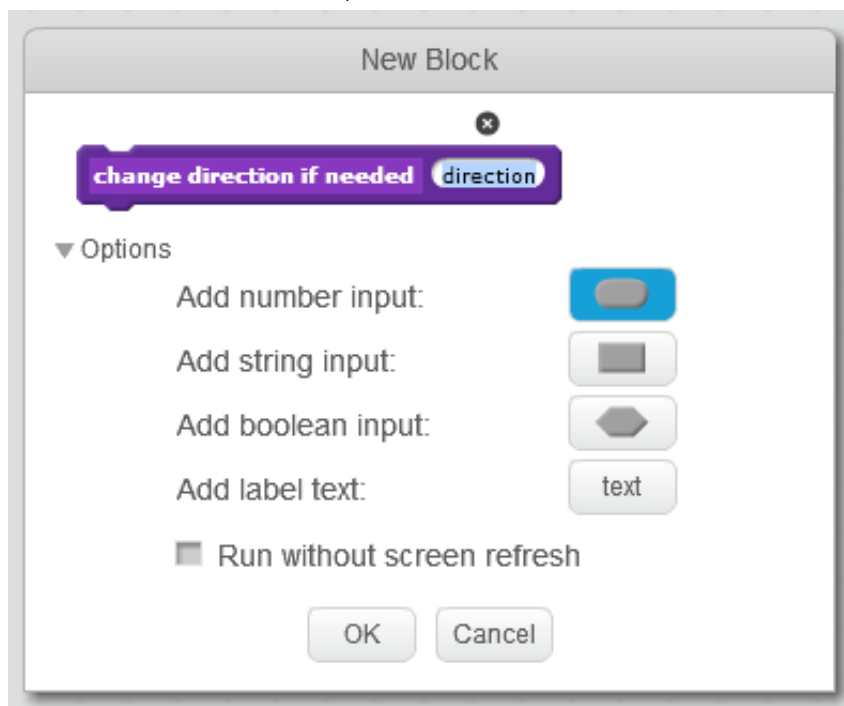
11. Create another custom block, called run
12. Add the following script to run, to make it possible for the cat to run at the runningspeed, and slow down gradually

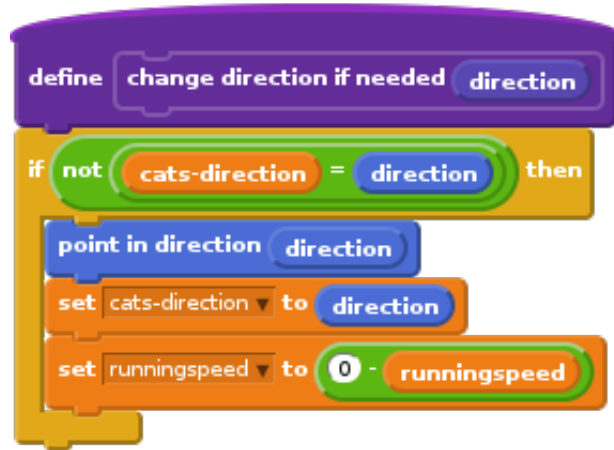


13. Combine these when the green flag is clicked

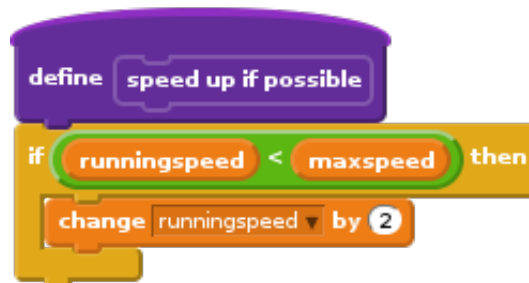


14. Create a custom block called "change direction if needed". It should take one number input called direction

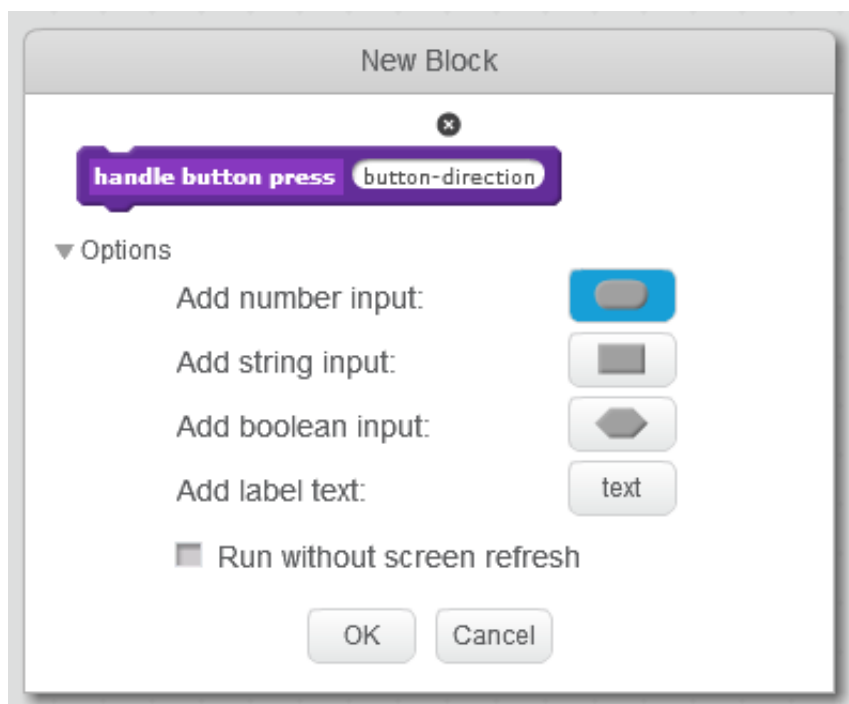




15. Create a custom block called speed up if possible which will increase speed, but only until the cat reaches maxspeed



16. Start to bring these together with a new custom block called handle button press which takes one number input called button-direction



```
define handle button press button-direction
change direction if needed button-direction
speed up if possible
next costume
```

17. Finally, add a script block that will use these custom blocks to control the cat's running

```
when green flag clicked
forever
if key left arrow pressed? then
handle button press -90
if key right arrow pressed? then
handle button press 90
```

18. Duplicate each of the cat's two costumes. We want two of the first costume, and two of the second costume. This will prevent the running animation from flickering too much



Save your project

Test Your Project

Click the green flag.

Use the left and right arrows to run from side to side

If you let go of the arrow key after picking up speed, the cat should slow down gradually instead of stopping instantly

If you switch directions while running, the cat should skid in the wrong direction briefly before switching

Things to try

- Try adjusting the speeds - the number in speed up if possible controls how fast the cat accelerates, the maxspeed value in reset controls the cat's top speed.

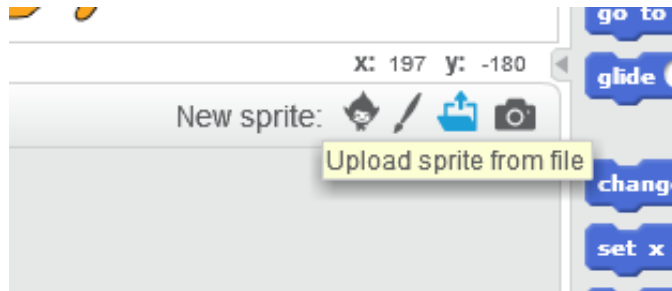
Step 2: Add falling rubbish

It's time to make items for the cat to recycle!

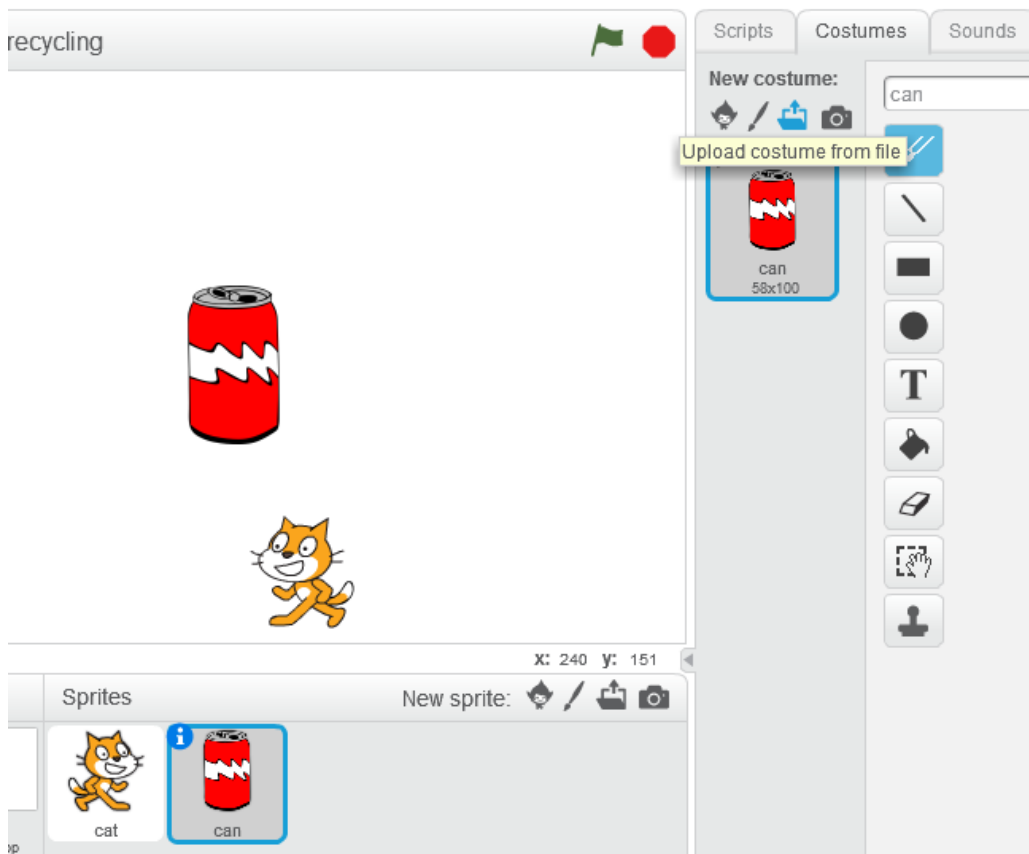
✓ Activity Checklist

Prepare the sprite

1. Upload a new sprite, choosing Resources/can.png

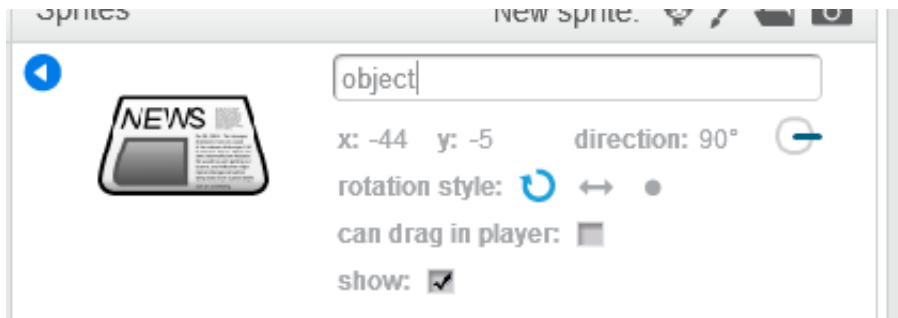


2. Switch to the Costumes tab, and upload another costume using Resources/jar.png

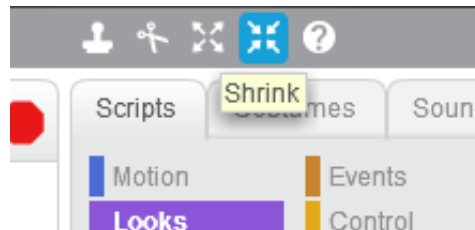


3. Upload another costume using Resources/newspaper.png
4. The sprite should now have three costumes: a can, a jar and a newspaper

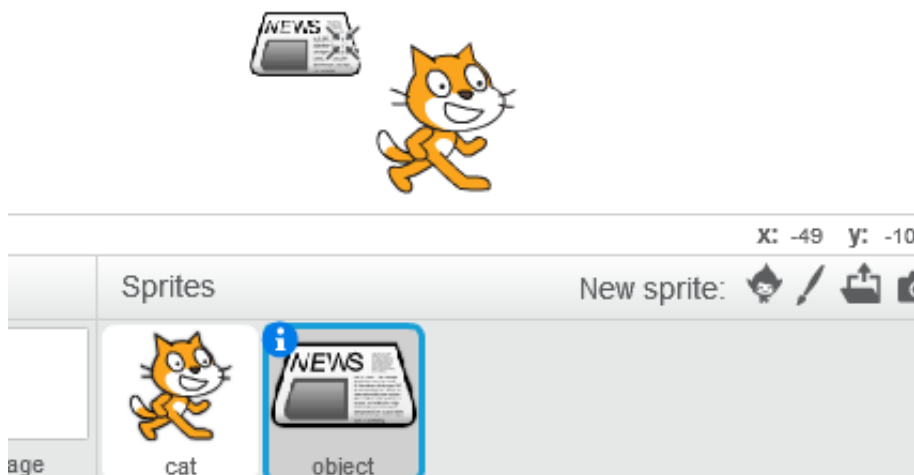
5. Click on the blue **i** next to the sprite, and rename the sprite to be called object □



6. Resize the sprite by clicking on the Shrink button at the top □

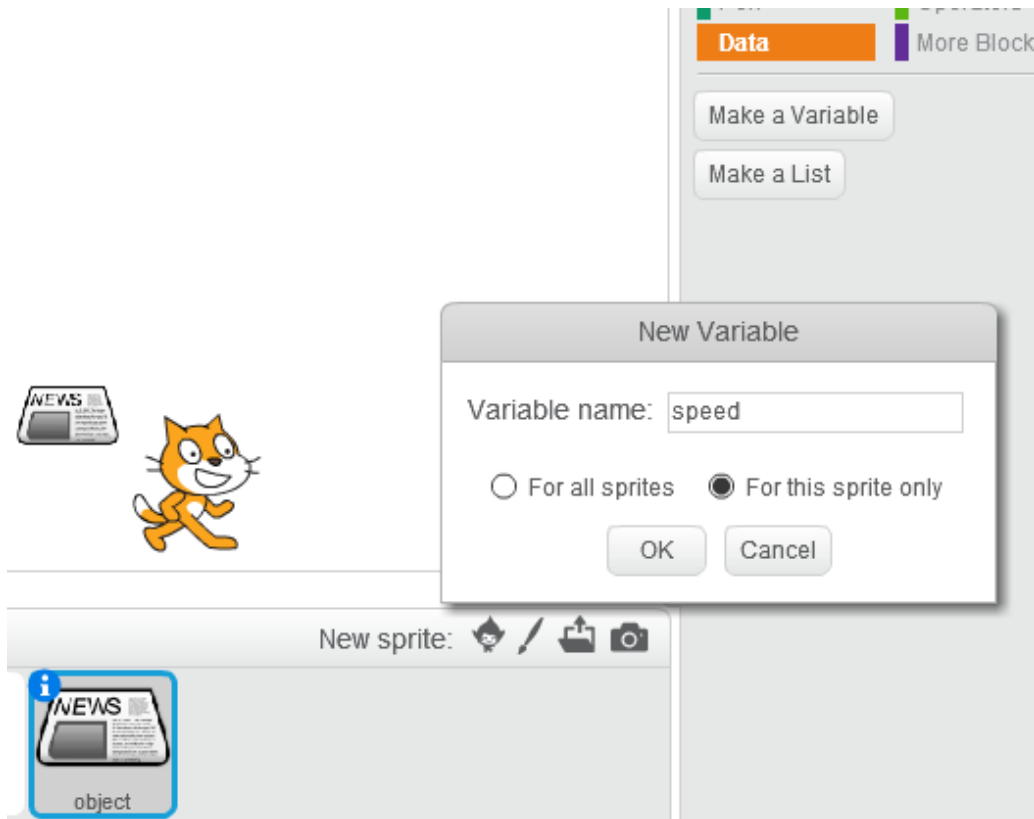


7. Click on the Sprite in the main stage window several times, until it is smaller than the cat □

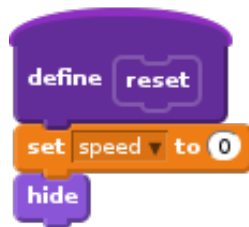


Get the rubbish to fall from the sky

1. Create a variable that will control the speed the rubbish falls, called speed □



2. Untick the variable so the value isn't shown on the main stage
3. Create a custom block called reset that will set the speed to 0 at the start



4. Create a custom block called falling that will make the object fall at this speed

```

define falling
  forever
    change y by speed
    if y position < -140 then
      set y to -140
    if speed > 0 then
      turn 15 degrees
    if speed < 0 then
      turn 15 degrees
  
```

5. Create a custom block called gravity that will make it speed up as it falls, but stop when it hits the ground

```

define gravity
  forever
    if y position > -140 then
      change speed by -1
    else
      set speed to 0
  
```

6. Create a custom block called choose object type that will choose a type of rubbish

```

define choose object type
  repeat pick random 1 to 10
    next costume
  
```

7. Create a custom block called start at the top that makes each new bit of rubbish start at a different place



```
define start at the top
  go to x: pick random -230 to 230 y: 180
```

8. Create a custom block called new object every four seconds



```
define new object every four seconds
  forever
    create clone of myself
    wait 4 secs
```

9. Bring it all together by creating the following script



```
when clicked
  reset
  new object every four seconds
```

```
when I start as a clone
  choose object type
  start at the top
  show
```

```
when I start as a clone
  gravity
```

```
when I start as a clone
  falling
```

Test Your Project

Click the green flag. The cat should still be able to run around, but now rubbish should rain from the sky, spinning as it falls.



Save your project

Things to try

- Try changing new object every four seconds to make rubbish fall more or less often
- Try changing gravity to change the speed that objects fall

Step 3: Carrying the rubbish

Now we want to make the cat to be able to pick up fallen rubbish and carry it.



Activity Checklist

Select the rubbish object sprite.

Create variables that will let us describe the different costumes of object

1. Create a new variable, for this sprite only, called can
2. Create a new variable, for this sprite only, called jar
3. Create a new variable, for this sprite only, called newspaper
4. Untick them all so they're not shown on the stage
5. Modify the existing reset custom block so that it looks like this. The numbers should match the costume numbers for the sprite.

```

define reset
  set speed to 0
  set can to 1
  set jar to 2
  set newspaper to 3
hide

```

Create variables to control what the cat is carrying

1. Create a new variable, for this sprite only, called nothing
2. Create a new variable, for all sprites, called carrying
3. Untick them both so they're not shown on the stage
4. Modify the existing reset custom block, to include setting both nothing and carrying to 4. It should end up looking like this.

```

define reset
  set speed to 0
  set can to 1
  set jar to 2
  set newspaper to 3
  set nothing to 4
  set carrying to 4
hide

```

Control how objects can be carried

1. Create a new custom block called wait to be carried that lets the cat pick up an object if it's not already carrying something. This will include creating a new event to broadcast carry-

change

```
define wait to be carried
  wait until carrying = nothing and touching cat
  set carrying to costume #
  broadcast carry-change
  repeat until key space pressed:
    go to x: x position of cat y: y position
  set carrying to nothing
  wait 1 secs
  wait to be carried
```

2. Create a new script so each new piece of rubbish can be carried



```
when I start as a clone
  wait to be carried
```

Test Your Project

Try out your game again.

The cat can carry an item of rubbish, and will drop it when you press the space bar.



Save your project

Step 4: Throwing the rubbish

The next step is for the cat to be able to throw the rubbish it's carrying into the air instead of dropping it.

✓ Activity Checklist

1. Create a custom block called throw in the air

```
define throw in the air
  set carrying to nothing
  broadcast carry-change
  set y to -139
  set speed to 20
```

2. Modify the existing wait to be carried block so that the cat throws the object instead of dropping it when you press space. It should end up like this.

```
define wait to be carried
  wait until carrying = nothing and touching cat
  set carrying to costume #
  broadcast carry-change
  repeat until key space pressed?
    go to x: x position of cat y: y position
  throw in the air
  wait until y position > 0
  wait to be carried
```

🚩 Test Your Project

Try out your game again.

The cat can carry an item of rubbish, and will throw it in the air when you press the space bar. It will fall back to the ground and can be picked up again.

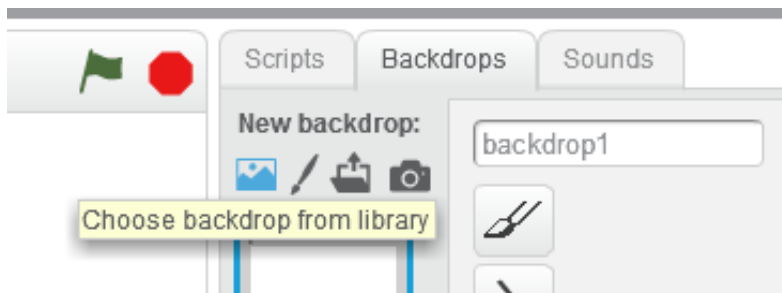


Step 5: Creating recycling bins

✓ Activity Checklist

Start by setting up a background for the bins.

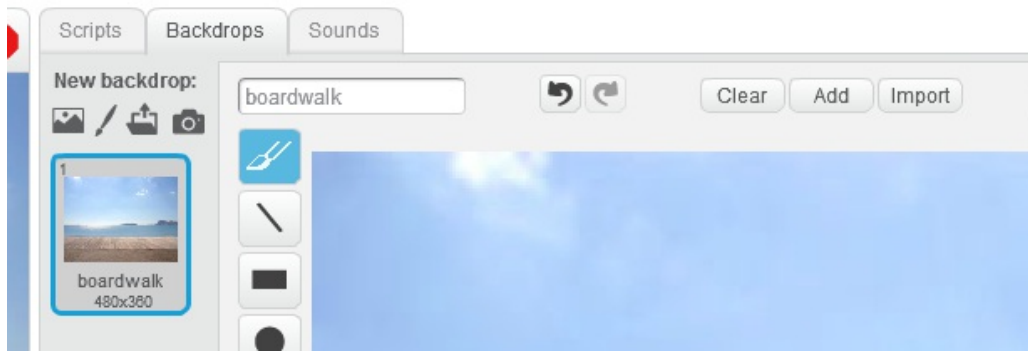
1. Click on Stage
2. Click on the Backdrops tab
3. Click on Choose backdrop from library and choose a background like boardwalk



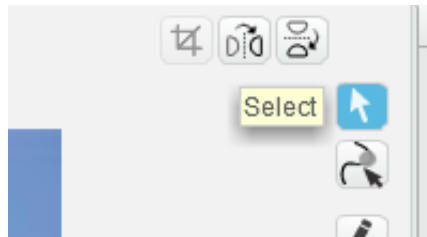
4. Delete the original blank backdrop 'backdrop1'

Add bins to the background

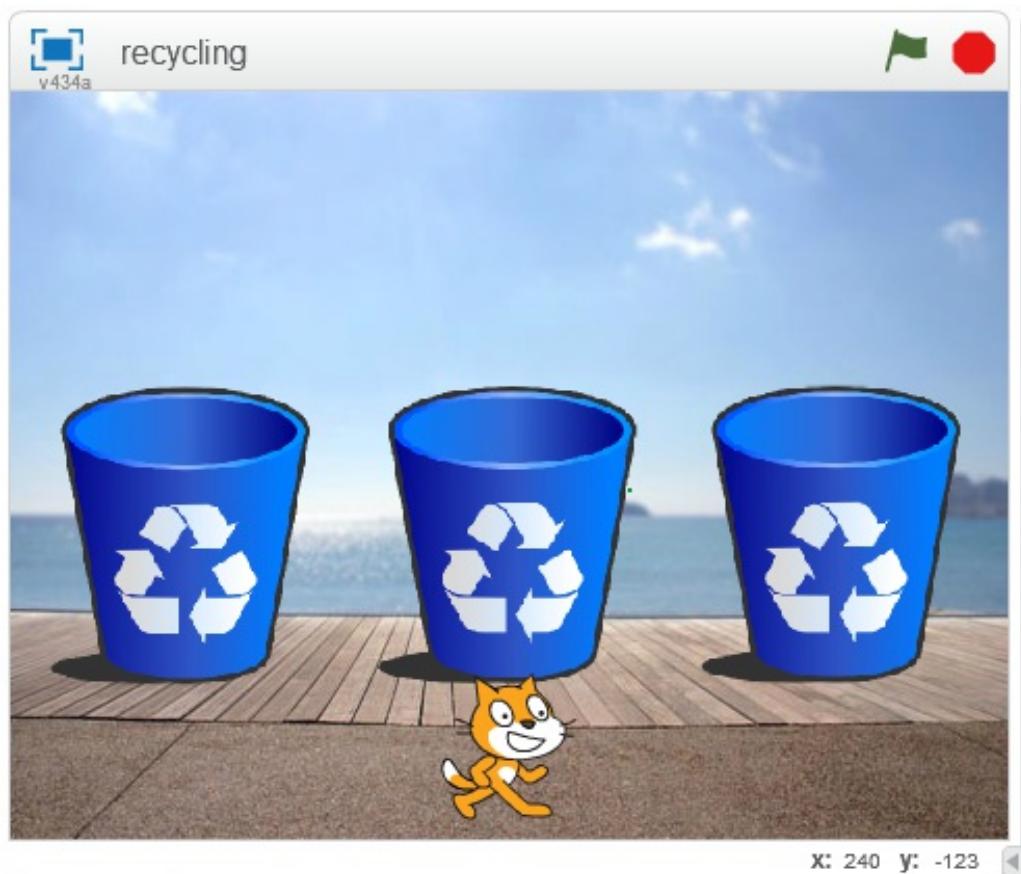
1. Click on Convert to vector
2. Click on Import on the Backdrops tab



3. Choose Resources/bin.png
4. Click on Select



5. Select the bin and move and resize it to put it on the boardwalk path
6. Add two more bins so it ends up looking something like this:



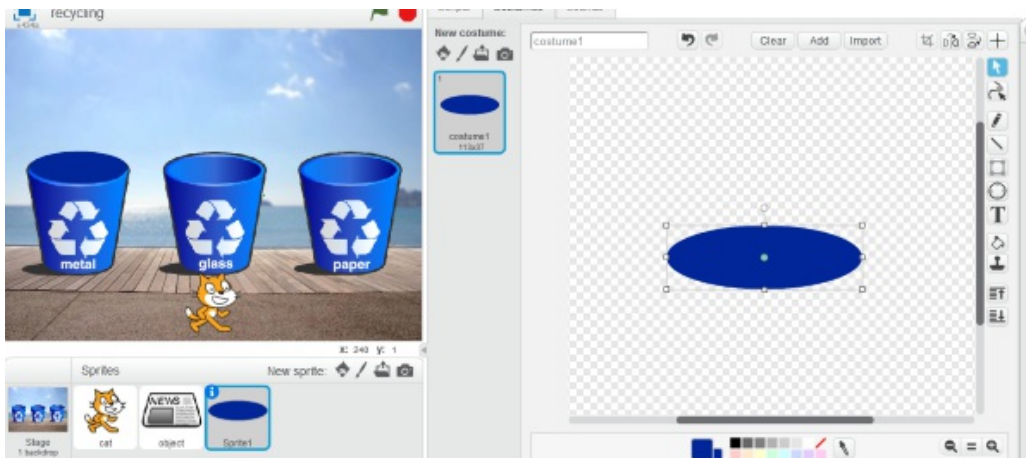
Add labels to the bins

1. Click on Text
2. Add labels to the bins - one for metal, one for glass, one for paper



Add the bin openings

1. Click on Paint new sprite
2. Click on the Costumes tab
3. Click on Convert to vector
4. Draw a filled oval that matches the opening for one of the bins



5. Click on the blue **i** and rename the Sprite to bin-can
6. Add a script that draws the bin behind thrown rubbish



7. Duplicate the sprite
8. Call the duplicate bin-jar
9. Move it to cover the second bin opening
10. Duplicate the sprite again
11. Call the duplicate bin-newspaper
12. Move it to cover the third bin opening

Get the rubbish to go in the bins

1. Click on the object sprite
2. Create a new custom block called rubbish binned



3. Create a new custom block called go in the bin

```

define go in the bin
  repeat until y position > 20
    if costume # = can and touching bin-can then
      rubbish binned
    else
      if costume # = jar and touching bin-jar then
        rubbish binned
      else
        if costume # = newspaper and touching bin-newspaper then
          rubbish binned
  
```

4. Modify the existing wait to be carried custom block so that thrown objects can go in the bin instead of falling back down. It should end up looking like this.



```

define wait to be carried
  wait until carrying = nothing and touching cat
  set carrying to costume #
  broadcast carry-change
  repeat until key space pressed?
    go to x: x position of cat y: y position
  throw in the air
  go in the bin
  wait to be carried
  
```

Test Your Project

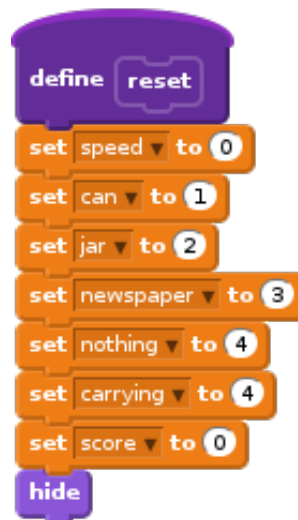
Try out your game again.

The cat can now throw items into bins. Items will only go into the correct bins, otherwise they'll fall back down onto the ground.



Step 6: Keep score

- Create a new variable, for all sprites, called score
- Move the score variable in the stage up into the corner
- Modify the custom reset block in the scripts for the rubbish objects to reset the score to 0, so it should look like:



- Modify the custom rubbish binned block so that it adds to the score. It should look like:



Test Your Project

Try out your game again.

The cat gets a point for every item that is put into the correct recycling bin.



Save your project

Well done, you've finished! Now you can enjoy your game!

Don't forget you can share your game with all your friends and family by clicking on Share on the menu bar!