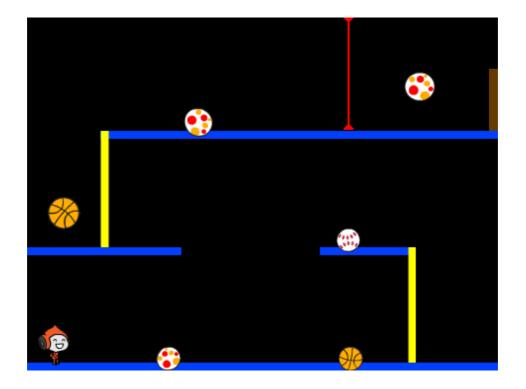
## Scratch 2

### (Beta) Dodgeball



#### Introduction

In this project you'll learn how to create a platform game, in which you have to dodge the moving balls and reach the end of the level.



**Activity Checklist** 



**Test your Project** 



**Save your Project** 

Follow these INSTRUCTIONS one by one

Click on the green flag to TEST your code

Make sure to **SAVE** your work now

#### **Step 1: Character movement**

Let's start by creating a character, that can move left and right, as well as climb up poles.

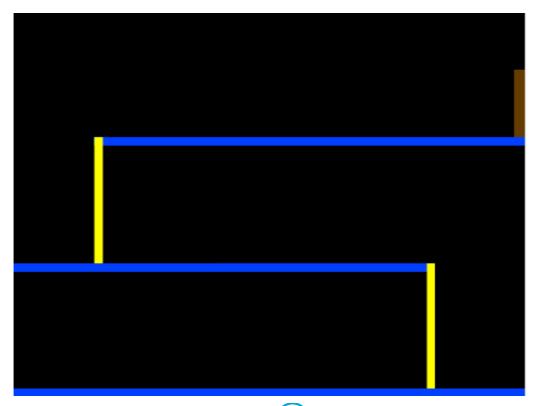
#### **✓**

#### **Activity Checklist**

- 1. Start a new project, and delete the cat sprite, so that your project is empty.
- 2. For this project, you should have a 'Resources' folder, containing the background image you'll need. Make sure that you can find this folder, and ask your club leader if you can't find it.

#### background.png

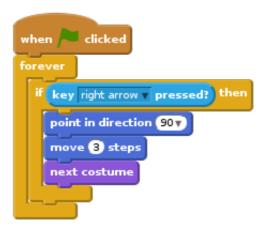
3. Add the image 'background.png' as a new stage backdrop, or draw your own! If you're drawing your own level, just make sure that the poles and the floors are different colours, and that there's a door (or something similar) that your player has to reach. Here's how your project should look:



4. Add a new sprite, which will be your character. It's better if you choose a sprite with multiple costumes, so that you can make it look as though it's walking.



5. Let's use the arrow keys to move your character around. When the player presses the right arrow, you want your character to point right, move a few steps and change to the next costume:



6. Test out your character by clicking the flag and then holding down the right arrow key. Does your player move to the right?

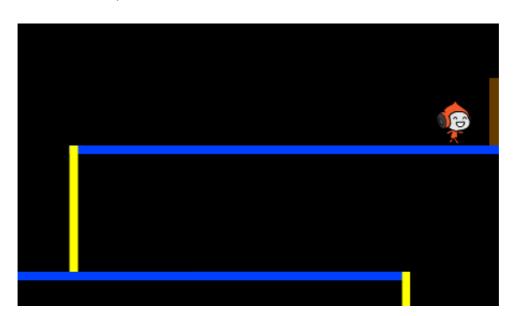
Does you character look like they are walking?



- 7. To move your character to the left, you'll need to add another if block inside your forever loop, which moves your character to the left. Remember to test your new code, to make sure that it works!
- 8. To climb a pole, your character should move up slighly whenever the up arrow is pressed and they're touching the correct colour. Add this code inside your character's forever loop:



9. Test your character - can you climb the yellow poles and get to the end of your level?





#### Challenge: Completing the level

Can you add more code to your character, so that they say something if they get to the brown door?





#### **Step 2: Gravity and jumping**

Let's make your character move more realistically, by adding gravity and allowing them to jump.

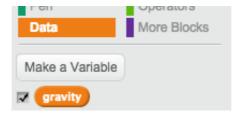


#### **Activity Checklist**

 You may have noticed that your character can walk off a platform into mid-air. Try to walk off of a platform and see what happens.



2. To fix this, let's add gravity to your game. Create a new variable called **gravity**. You can hide this variable from your stage if you want to.



3. Add this new code block, which sets the gravity to a negative number, and then uses this to repeatedly change your character's y-coordinate.

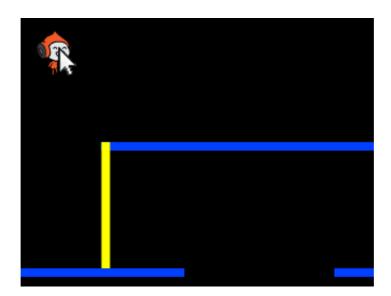
```
when clicked

set gravity v to -4

forever

change y by gravity
```

4. Click the flag, and then drag your character to the top of the stage. What happens? Does the gravity work as you expected?



5. Gravity shouldn't move your character through a platform or a pole! Add an if block to your code, so that the gravity only works when your character is in mid-air. The gravity code should now look like this:

```
when clicked

set gravity v to -4

forever

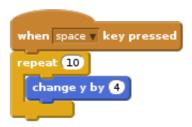
if not touching color ? or touching color ? then

change y by gravity
```

6. Test the gravity again. Does your character stop when they are on a platform or a pole? Can you walk off the edge of platforms to the level below?



7. Let's also make your character jump when the player presses the space bar. One very easy way to do this is to move your character up a few times, using this code:



As gravity is constantly pushing your character down by 4 pixels, you need to choose a number greated than 4 in your change y by (4) block. Change this number until you're happy with the height your character jumps.

- 8. If you test out this code, you'll notice that it works, but the movement isn't very smooth. To make jumping look smoother, you'll need to move your character by smaller and smaller amounts, until they're not jumping anymore.
- 9. To do this, create another variable called jump height. Again, you can hide this variable if you prefer.
- 10. Delete the jumping code you added to your character, and replace it with this code:

```
when space v key pressed

set jump height v to 8

repeat until jump height = 0

change y by jump height

change jump height v by -0.5
```

This code moves your character up by 8 pixels, then 7.5 pixels, then 7 pixels, and so on, until your character has finished jumping. This makes jumping look much smoother.

11. Change the starting value of your jump height variable and test it until you're happy with the height your character jumps.



#### **Challenge: Improved jumping**

Your character is able to jump whenever the spacebar is pressed, even if they're already in mid-air. You can test this by just holding down the spacebar. Can you fix this, so that your character can only jump if they're touching a blue platform?



Save your project

#### **Step 3: Dodging balls**

Now that you've got your character moving around, let's add some balls for your character to avoid.



1. Create a new ball sprite. You can choose any type of ball you like.







Basketball



Beachball

2. Resize your ball, so that your character can jump over it. Try jumping over the ball to test it.



3. Add this code to your ball:

```
when clicked

hide

forever

wait 3 secs

create clone of myself v
```

```
when I start as a clone
go to x: 160 y: 160
show
repeat 22
change y by -4

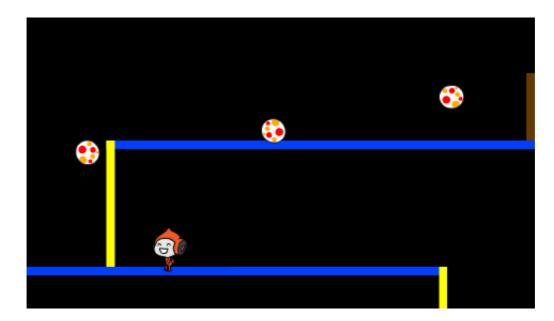
repeat 170
change x by -2
turn ) 6 degrees

repeat 30
change y by -4

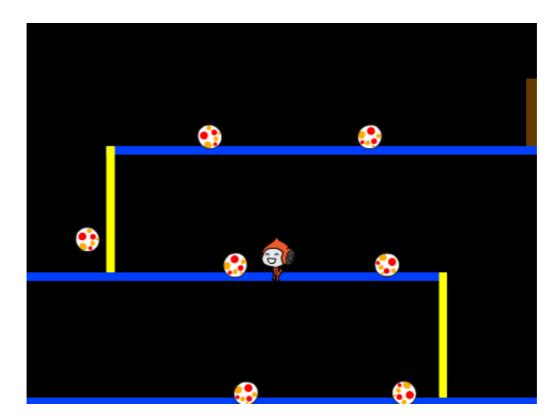
delete this clone
```

This code creates a new ball clone every 3 seconds. Each new clone moves along the top platform.

4. Click the flag to test this out.



5. Add more code to your ball sprite, so that they move across all 3 platforms.



6. Finally, you'll need code for when your character gets hit by a ball! Add this code to your ball sprite:



7. You'll also need to add code to your character, to move back to the start when they're hit:

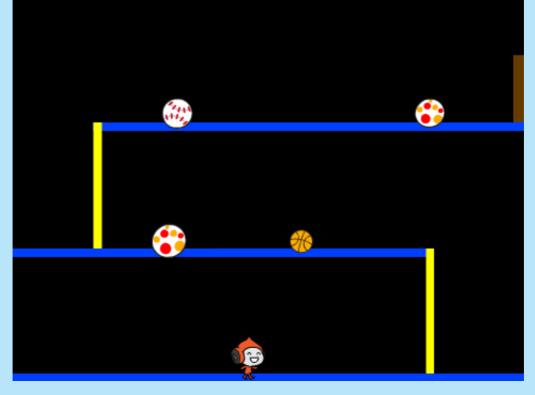


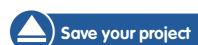
8. Test out your character and see if they go back to the start when they've been hit by a ball.



Save your project

# Challenge: Random balls The balls your character has to dodge all look the same, and always appear every 3 seconds. Can you improve them, so that they: don't all look the same? appear after a random amount of time? are a random size?





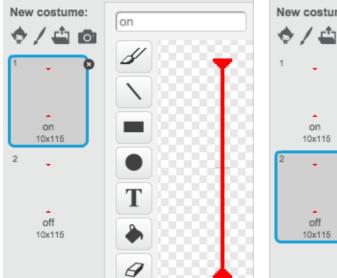
#### **Step 4: Lasers!**

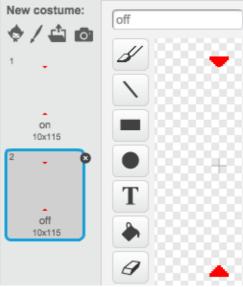
Let's make your game a little harder to compelte, by adding lasers!



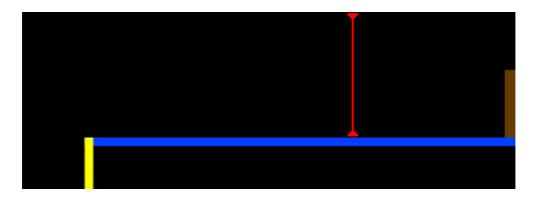
1. Add a new sprite to your game, called 'Laser'. It should have 2

costumes, called 'on' and 'off'.

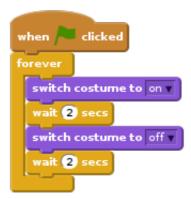




2. Place your new laser anywhere you like, between 2 platforms.



3. Add code to your laser, to make it switch between the 2 costumes.



If you prefer, you can wait a random amount of time between costume changes.

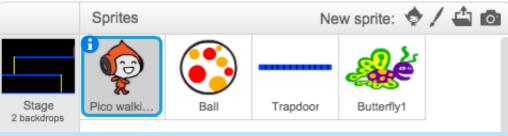
4.	Finally, add code to your laser, so that the 'hit' message is broadcast when the laser touches your character. This code will be the same as the code you added to your ball sprite.	
	You don't need to add any more code to your character - they already know what to do when they get hit!	
5.	Test out your game to see if you can get past the laser.  Change the wait times in your code if the lasers are too easy or too hard.	

#### **Challenge: More obstacles**

If you think your game is still too easy, you can add more obstacles to your level. You can add anything you like, but here are some ideas:

- A flying killer butterfly;
- Platforms that appear and disappear;
- 🔲 Falling tennis balls that must be avoided.





You could even create more than one backdrop, and move to the next level when your character reaches the brown door:

```
switch backdrop to next backdrop v
go to x: -210 y: -120
wait 1 secs
```



#### **Challenge: Improved gravity**

There's one other small bug in your game: gravity doesn't pull your character downwards if any part of it is touching a blue platform - even it's head! You can test this out by climbing most of the way up a pole and then moving to the left.



Can you fix this bug? To do this, you need to give your character different coloured trousers (on all costumes)...



...and then replace the code:

touching color 🚾 ?)

with:

color <mark>is touching ?</mark> ?

Remember to test your improvements to make sure you've fixed the bug!



#### **Challenge: More lives**

Can you give your player 3 lives, instead of just sending them back to the beginning each time? Here's how your game could work:

	Your	player	starts	with	3	lives;
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- Whenever your player gets hit, one life is lost and they go back to the start;
- lue If there are no lives left, the game ends.



Save your project