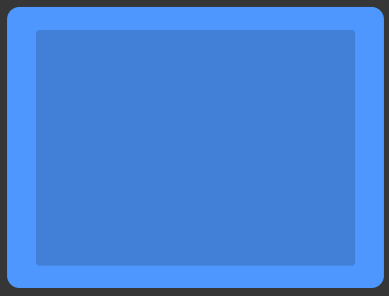
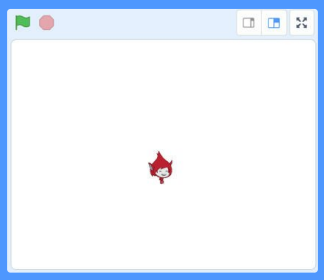
# Platformer Game

Use physics and gravity

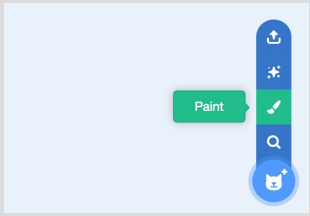


## Choose your character

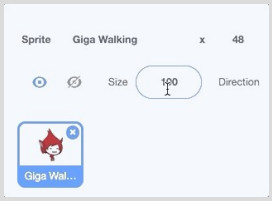
Pick a sprite or paint your own.



Pick a sprite or paint your own.



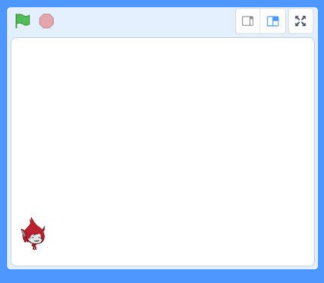

Shrink it




No clues left! Ask a friend?

## Starting position and physics

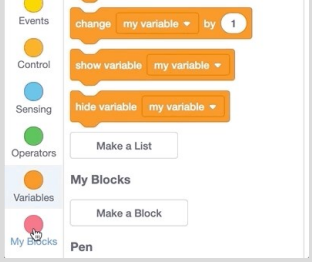
We can use variables to control how fast we move in the x and y directions and how strong the force of gravity is in the game.



Go to a location

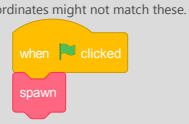
Using 'My Blocks' can help make the code easier to understand and to reuse. Make a block and name it spawn.

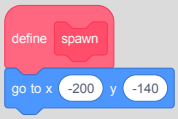





### Go to a location

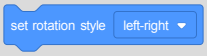
Often games start in the lower left corner of the stage, but you can start anywhere you like. Your x and y coordinates might not match these.



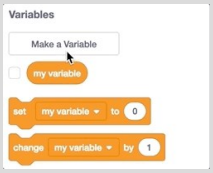

### Don't flip upside down

Many sprites flip upside down when facing the left. This fixes that.




### Make variables for x and y velocity

x velocity is how fast you are moving in the horizontal direction (left or right). y velocity is fast you are moving in the vertical direction (up or down).




### Set velocity variables to 0

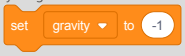



### Make gravity

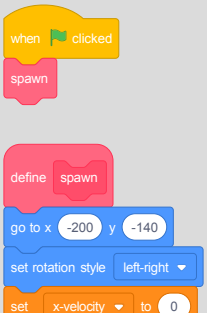
Gravity is a force affecting our y velocity. Make another variable for gravity. Do you think gravity will be a force in the positive y direction (up) or the negative y direction (down)? Read more about gravity on the NASA website.

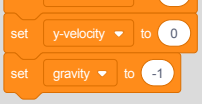
### Set gravity variable

On earth, gravity is a force of approximately 10 meters per second squared. Later, you can experiment with what it would be like if gravity changes in your game.




### Full code example

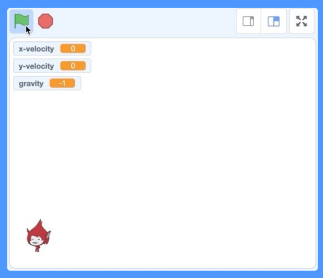





No clues left! Ask a friend?

Running

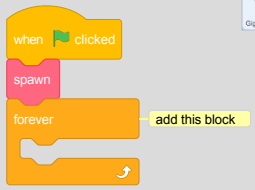
Use the keyboard to move left and right




### Main Game Loop

This project uses a main game loop. Inside this forever block, Scratch will keep checking if the character is moving, jumping, or falling.

### Start with these blocks

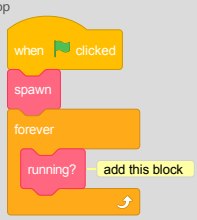



### x velocity

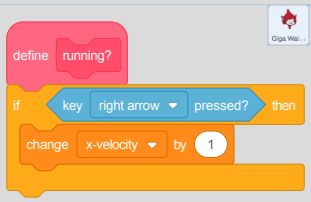
First, we set the x velocity based on which key is pressed. Then we will update the x position of the sprite based on the x velocity.

### Running?

Make a block called running? and add it to the game loop




### To the right




### To the left

How could you make the player move left?

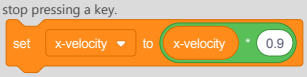
### To the left




What do you need to change to make the player go left?

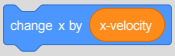
### Slide to a stop

The player should gradually slow down when you stop pressing a key.

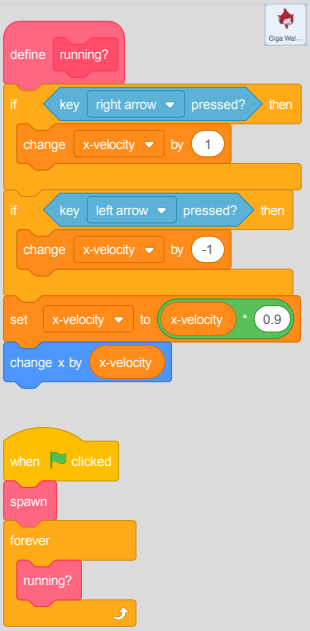



### Move the player

Finally we can move the player using the x velocity.



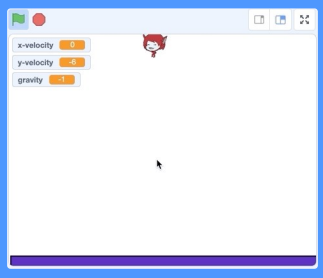

### Full code example



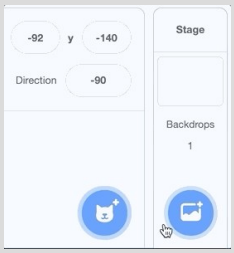

No clues left! Ask a friend?

## Gravity makes you fall

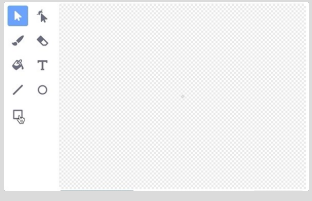
You will need some platforms to stand on.




### Paint a backdrop

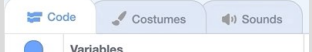


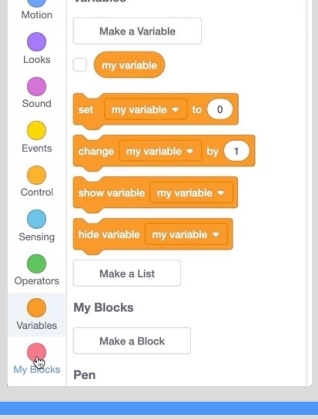

### Draw the ground



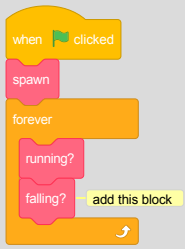
### Make a falling? block

Create a 'My Block' called falling?

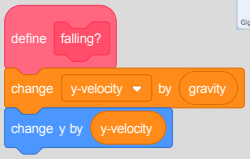




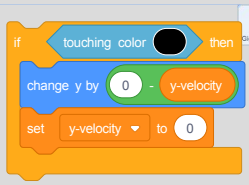

Add it to the game loop



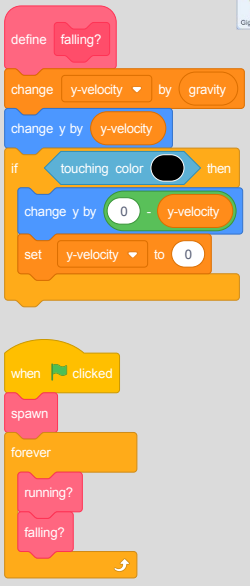

Gravity always affects you




But go back up if you hit a platform



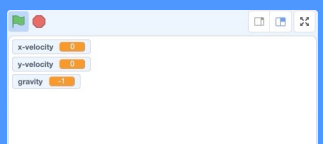

Full code example




No clues left! Ask a friend?

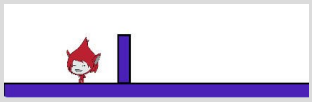
Walls

You can't walk through walls...





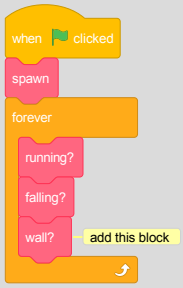
Add an obstacle to the platform backdrop



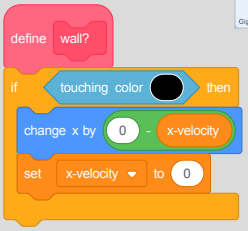
Make a 'My Block'

Make a 'My Block' called wall? and add it to the game loop.

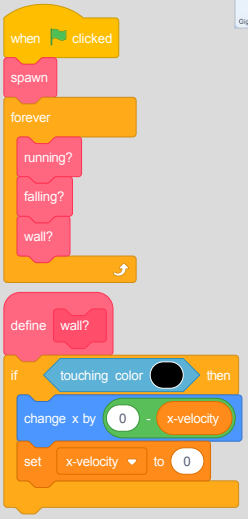
Make a 'My Block'




Don't walk through walls




Full code example




No clues left! Ask a friend?

Jump!

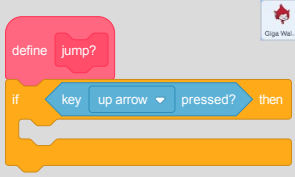
Jump over obstacles and to reach platforms



Make a jump? block and add it to the falling? definition

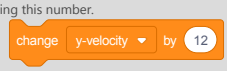



Which key will you use to jump?

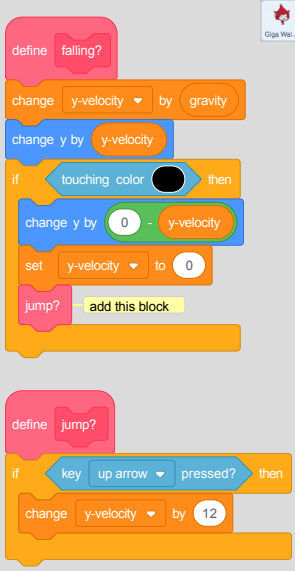



Jumping force is the opposite of gravity

Experiment with different jumping abilities by changing this number.



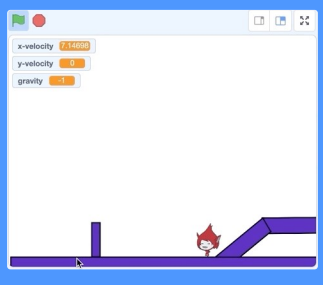

Full code example




No clues left! Ask a friend?

Walk up ramps

Add this code if you want to be able to walk up ramps.




Make a block call ramp? and add it to the game loop





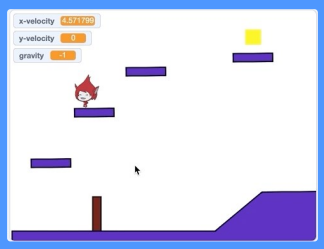

Move up a bit, if you're stilling touching the wall color, then you're not on a ramp so move back down.




No clues left! Ask a friend?

Winning?

Get to the goal!



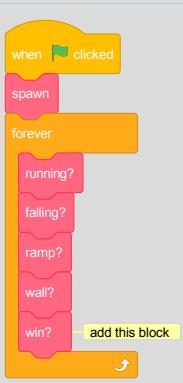

Add a goal

Use the art tools to add a unique color to the backdrop for the goal. Alternately, add a new sprite to be the goal.

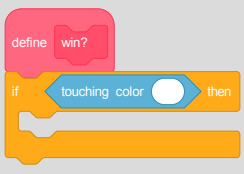
Impossible?

Play test your level and make sure you can get to the goal. Move things around and redraw platforms until it is not too easy or too hard.

Make a block called win? and add it to the game loop



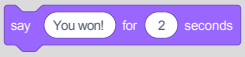

How do you know if you won?




Use the eyedrop color picker to select the exact color of the goal. Or use this if you chose a sprite for the goal:



What happens when you win?



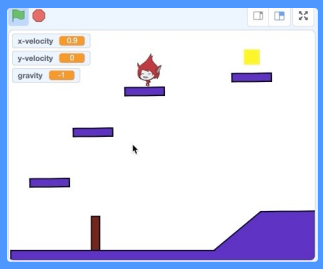

Full code example




No clues left! Ask a friend?

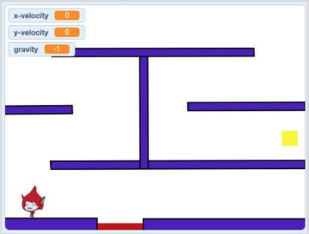
Next Level!

What happens on the next level?

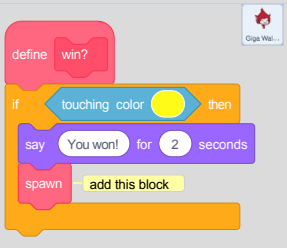



Paint a new level

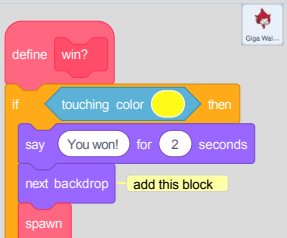
Create a new backdrop. It's easiest if the spawn point is in the same place.



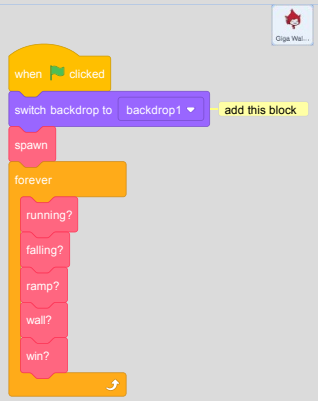

Spawn when you get to the goal




Switch backdrops when you win



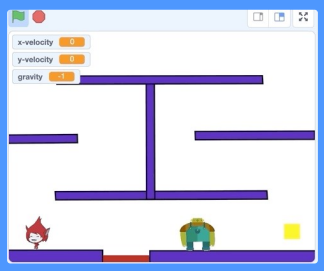
Switch to first level when you start




No clues left! Ask a friend?

Baddies!

Watch out for the baddies!




Add an enemy sprite

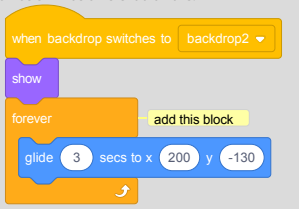
Put the baddy in the location where it should start and change the size.

Only show on the right level




Glide back and forth to guard the goal

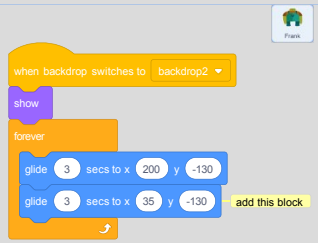
Scratch will automatically update the x and y coordinates for the position of your sprite. Your numbers will be different than this!



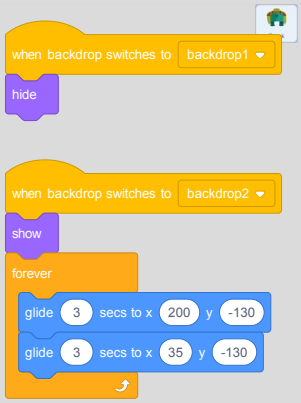

Guarding

Drag the baddy to the next location it will move to.

Glide to the the next position



Full baddy code example




Make a baddy block

Switch to your main character sprite.



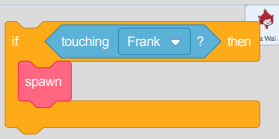

How can you tell if you run into the baddy?



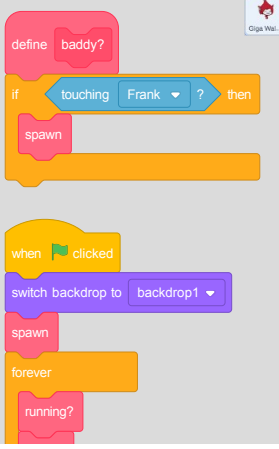

Touching?

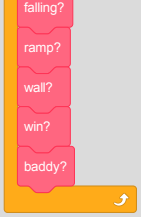



Restart!




Full character code example

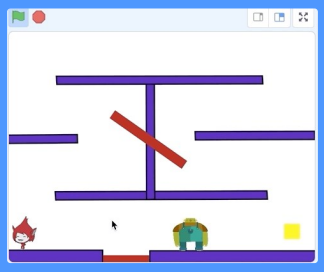





No clues left! Ask a friend?

More ideas

What else can you add?



Hide variables

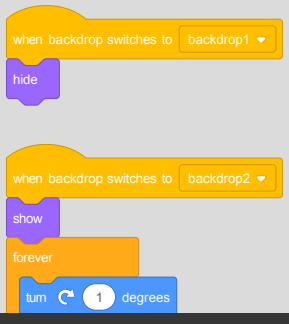



Add lava

Add patches of lava to your level. You might use this block:




Spinning obstacles




Challenge Galaxy

No clues left! Ask a friend?

Share!

Code Reference

There are many ways to create this project, but here is one way.

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