

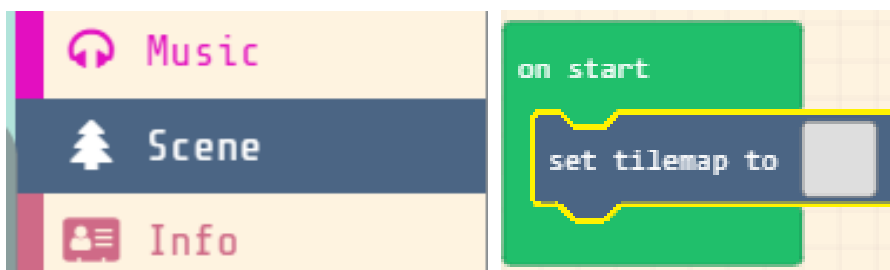
Basic Platformer Guide

Sample: https://makecode.com/_i1CLd3JcRPoq

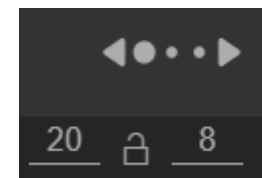
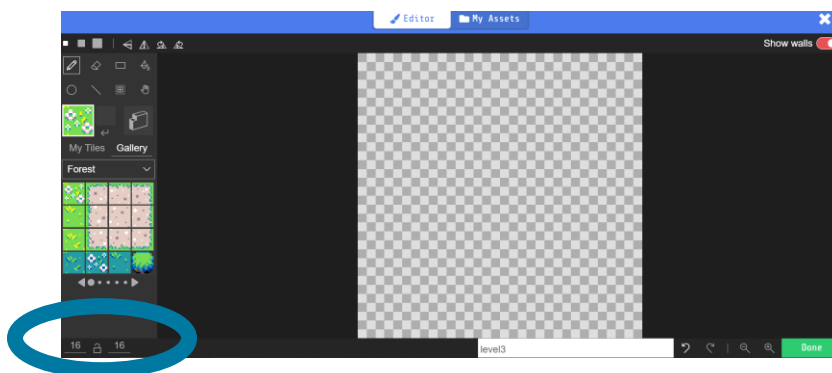
Starting Your Platformer

Today you're going to create a platformer game. In this style of game, characters can jump up onto platforms to get through the map!

Create a new project. To make a platformer you are first going to make a tilemap. Go to **Scene** and select **set tilemap to []**.



Click on the grey square to edit the tilemap. You're going to edit the tilemap size. Go to the bottom left corner of the screen where it says **16 and 16**. These are the xy dimensions of your tilemap.



The **first number is for your X axis (width)** and **second number is for your Y axis (height)**. For a platformer you can make the X axis longer! Click each number to type in your desired dimensions. For this example, you will use **20x8**.

NOTE: The main screen of MakeCode operates using pixels for its dimensions. Tilemaps use tiles to measure the dimensions. A tile map with a Y-axis of 8 is the most ideal for sideways platformer. This is because the screen is about 8.5 tiles tall.

Now you can begin to design your tilemap.

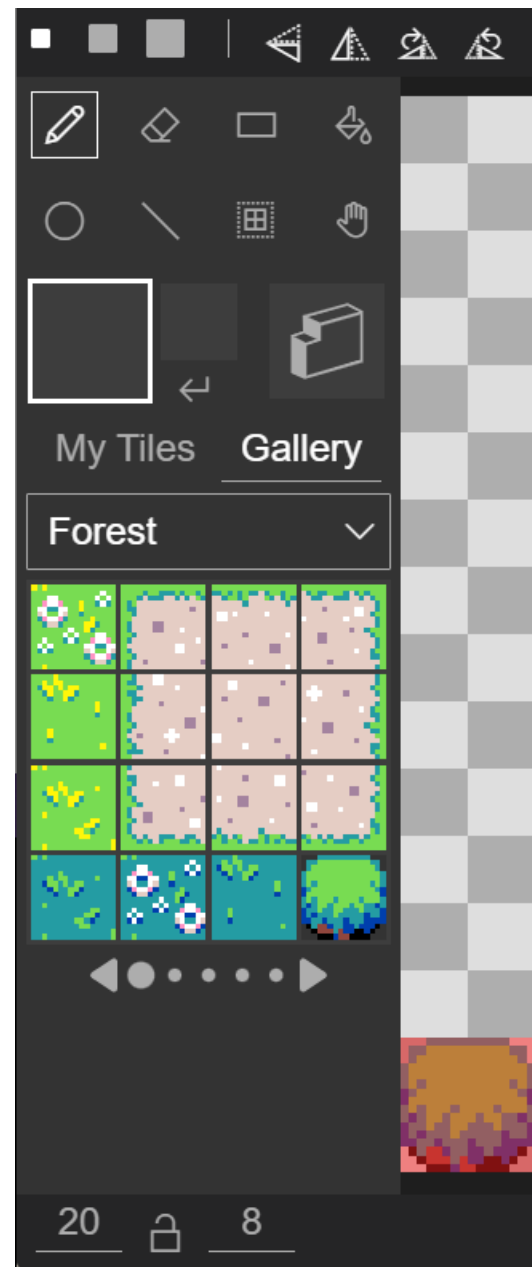
Controls for design are on the lefthand side of the screen. Near the top there are three different sized squares that control the brush size, as well as controls to flip or rotate the entire design. Below these options are your drawing tools. Hover over the tools to see what they do (**paint, erase, rectangle, fill, circle, line, marquee, canvas pan**).

NOTE: Marquee allows you to select your drawing by clicking and dragging the square around the design. You can then move the design on the canvas or “resize” it. Canvas pan allows you to click on the screen and move it around – this is very useful for intricate designs.

Beneath the tools you will find two tile boxes and a brick button. The two tile boxes are your selected tile. The bigger one can be controlled by the left click on your mouse, the smaller with the right click on your mouse. You will explore the brick button later in this guide.

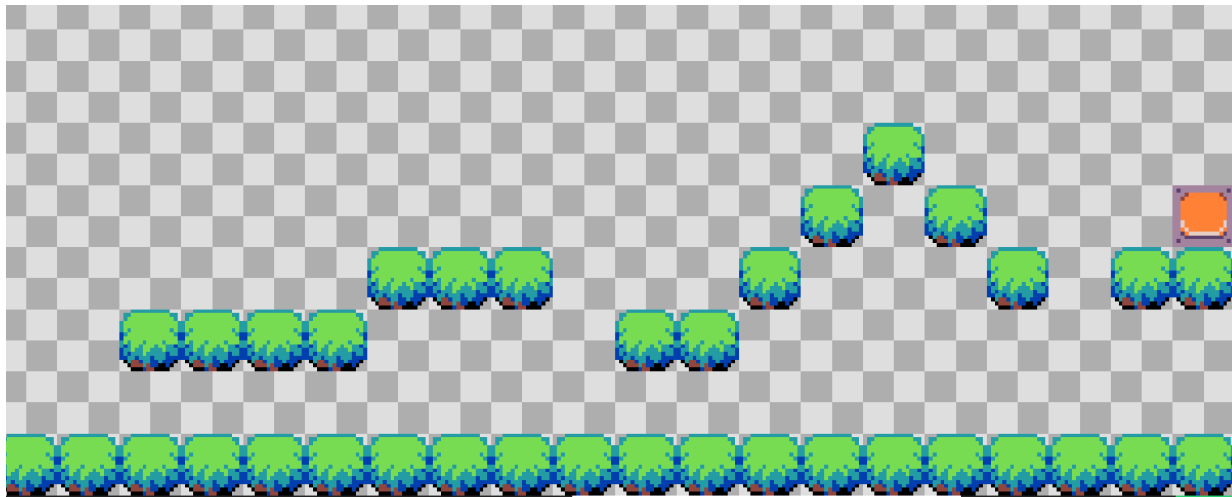
Explore the galleries by clicking on the word “forest” to get a drop-down menu of options. The arrows under the pre-made tiles allow you to view multiple pages within each category.

“Undo” and “redo” arrow buttons are on the lower righthand side next to the two magnifying glass icons. These can also be controlled using keyboard shortcuts **CTRL+Z (undo)** and **CTRL+Y (redo)**.



Select a tile and start designing! We recommend using a specific type of tile to be your platform tile and using another unique tile to be a goal to trigger the end of the level!

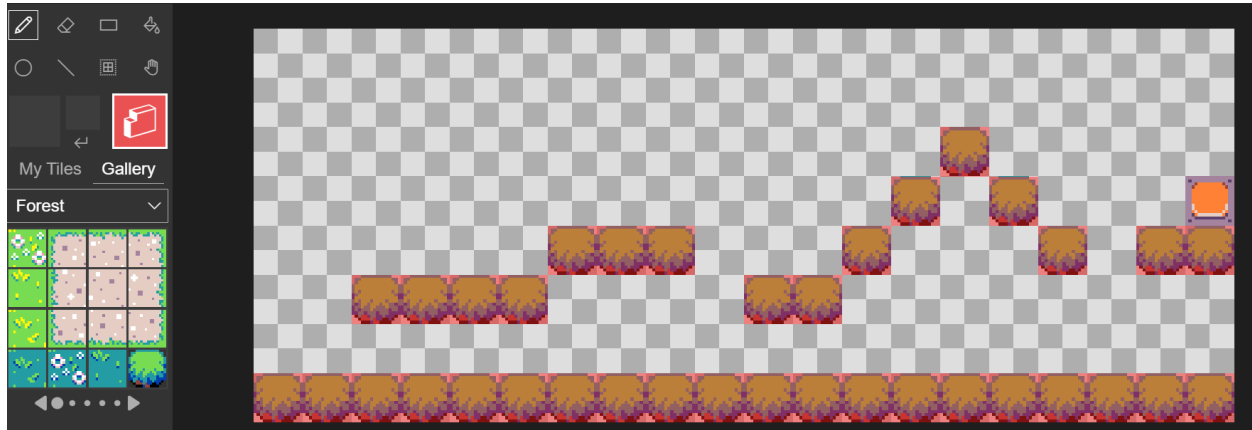
Here is an example of a completed map. Generally, platformer games will have a ground along the bottom and some platforms to jump onto and collect things/move around! You can see here that we used a bush to make the platforms/ground and an orange button as your goal.



Don't close the tilemap editor just yet! You now need to make your tiles "solid", a.k.a make them **walls** that your character sprite cannot pass through. Make sure you have selected the paint tool and then click on the brick in the side panel. Clicking the brick will turn it red to indicate that it has been selected. **Selecting tiles on your map when the brick tool is selected will turn the tiles into walls that your character can't pass through.** These can be either walls to block the character's path, or platforms to jump on. Make sure you don't turn the unique end-point tile into a wall.

NOTE: Walls will now have a red tinge to them. This will not show in the game.

Click the green "Done" button to complete your tilemap.



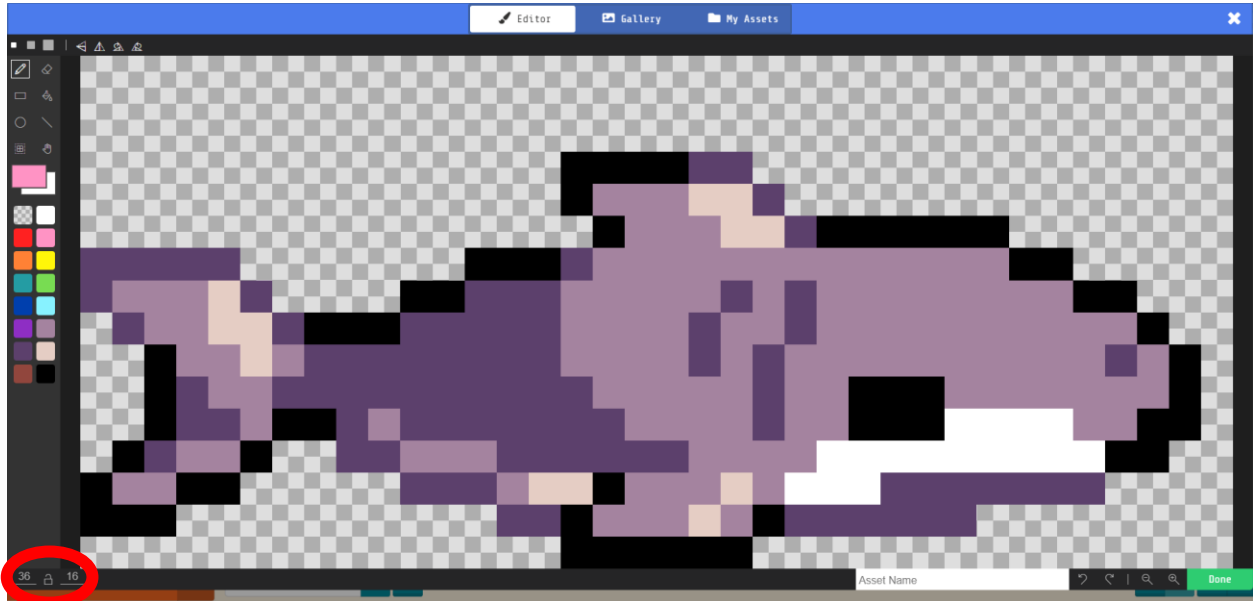
Create a Sprite

Time to create a sprite. In the **Sprites** menu grab a **set mySprite to sprite () of kind player** and place it below the tilemap inside of your **on start** event block. The first thing you should always do when creating a character is **give the variable a name**. Click on the word **mySprite** and select **new variable**.



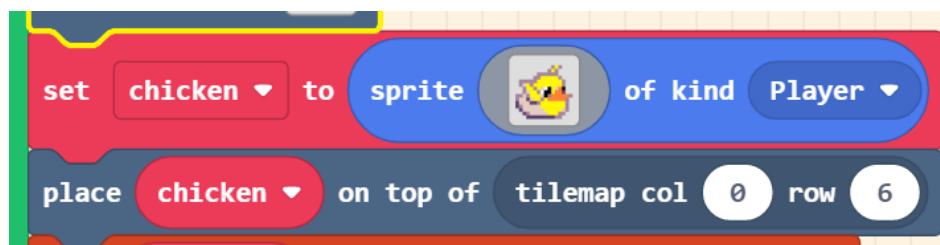
Then, click on the grey square **select or design an image** for your sprite. There are a lot of options to choose from in the gallery, or you can use the art tools on the left-hand side (these work similarly to the tilemap editor).

We strongly recommend you choose a sprite with dimensions 16 x 16. You can see the dimensions of your sprite in the lower lefthand corner of the sprite editor (example below).

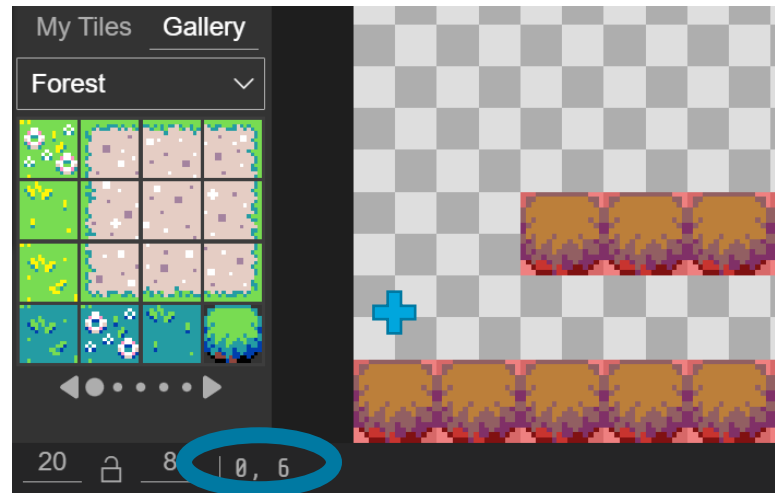


The shark above has dimensions 36 x 16 and is therefore not your best choice for this tutorial! (If you do use a bigger sprite like the shark, make sure when you place it on your tilemap that the entire sprite is visible, and that your sprite can fit in between all your platforms. Otherwise this can lead to bugs in your game.)

To place the sprite at a specific location on your tilemap go into the scene menu and select **place mySprite on top of tilemap col (0) row (0)**. Place this below the sprite creation block.

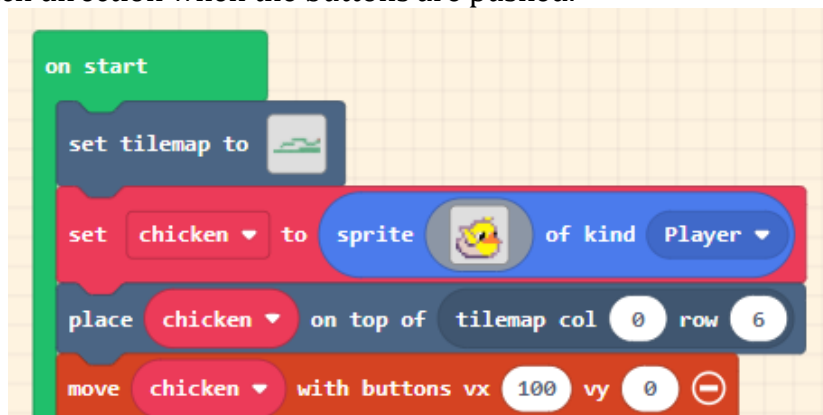
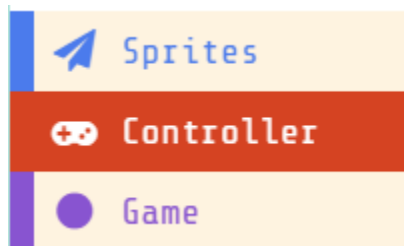


To find the coordinates for your sprite's location go into your tilemap and **place the cursor over the position you want your player to start at**. Do not move your mouse! Now look at the bottom left corner (next to the dimensions from earlier!) to see the coordinates of that location. Insert these into the **place mySprite on top of tilemap col (0) row (0)** block.

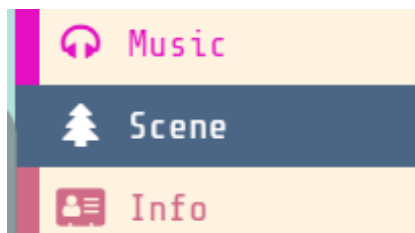


To make the character sprite move, go into the Controller menu, and select **move mySprite with buttons**. Change the sprite name to match and then click on the plus button at the end of the block to open up **vx (100) vy (100)**. Change your **vy to 0** so that you can only control left and right, not up and down.

NOTE: Vx = velocity in the x direction, vy = velocity in the y direction. These control how fast your sprite will move in each direction when the buttons are pushed.



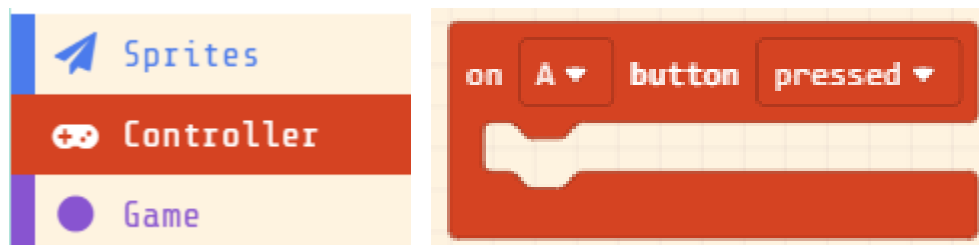
You will notice that your sprite can now disappear off the screen! To fix this problem go into the **scene** menu and select **camera follow mySprite** and place it under the move block.



TIP: You will notice that you keep adding blocks at the bottom of the big green on start event block. This is important because the code runs sequentially. If you tell the code how to move the character sprite **BEFORE** creating the character sprite, the computer will get confused and not work properly.

Jumping Chickens

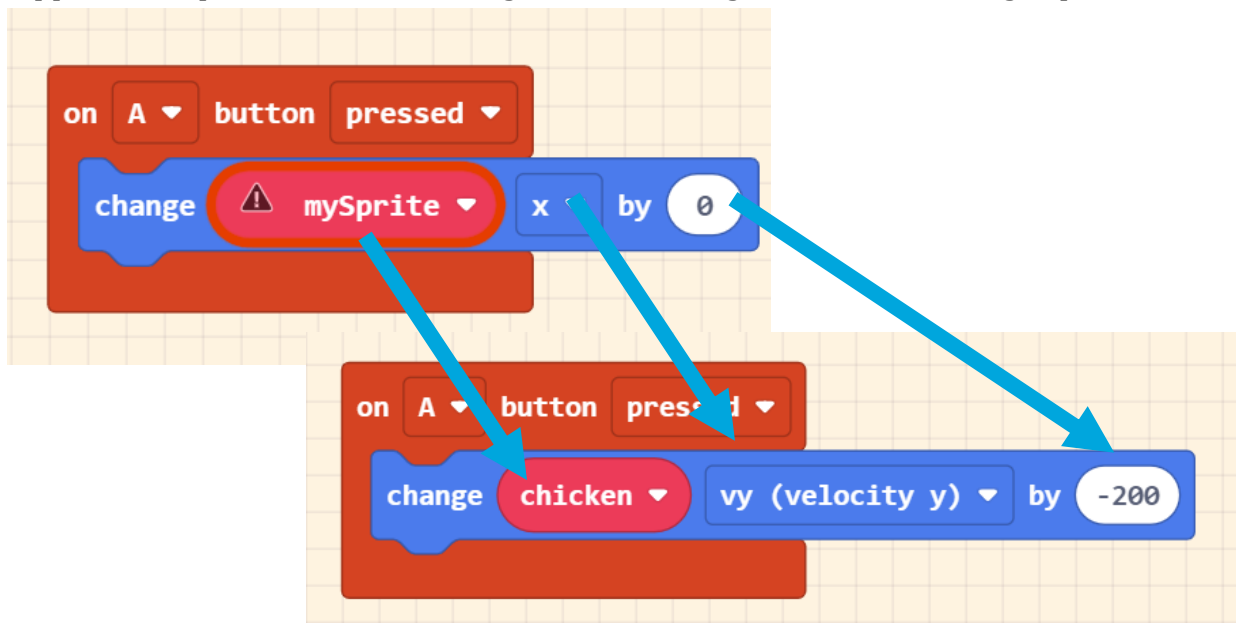
Choose a button to make your sprite jump. Go to **Controller** and select a **on A button pressed** block. You will notice that this block looks similar in shape to the green On Start block. This is because it is an event block. Anything that you put inside the **on A button pressed** will only happen when you press A on the game “device” (space bar on the keyboard).



To make your character jump when you press the A button go into **Sprites** and select a **change mySprite x by 0** block. Make sure to change the name from **mySprite** your sprite's name.

Next, click on the **X** and select **VY (velocity Y)** from the drop-down menu. Finally, type **-200** in where the 0 is. Now you can go up... forever!

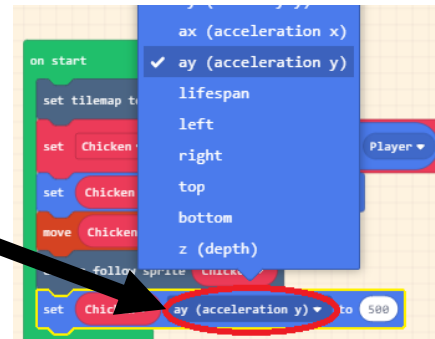
NOTE: In MakeCode Arcade 0,0 is in the top left corner and the whole cartesian plain is flipped. Thus, positive numbers will go down, and negative numbers will go up.



Let's fix this by adding two things; (1) "gravity" and (2) a rule that **ONLY** allows you to jump if you are touching the ground.

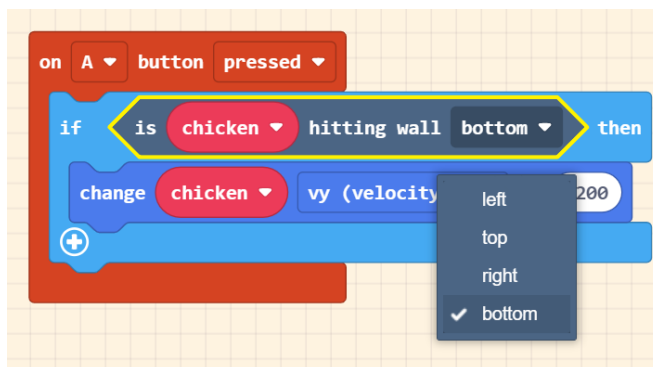
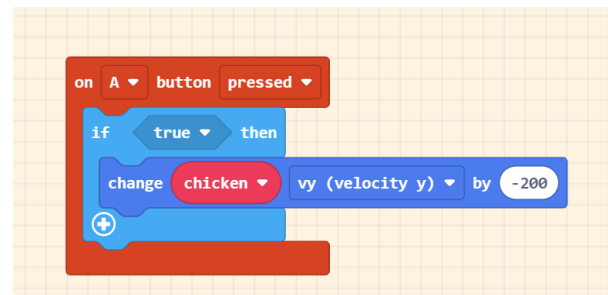


To add gravity, you need to set a default acceleration. Go to **Sprites** and select **set mySprite x to 0**. Place this in your **On Start** block under the **camera follow sprite mySprite** block. Make sure you change the name to your sprite. Then change the **x** to **ay (acceleration y)** and change the number to **500**.



Now your character can jump when you press A and then fall to the ground due to the “gravity” you have created. You will, however, be able to jump indefinitely. To fix that, you need to create a **conditional that evaluates whether the character is touching the ground**. When the character IS touching the ground it can jump, but if it is in the air it cannot jump.

First, go into **Logic** and select **if <true> then** and place it inside the **on A button pressed** event block. Make sure to put the **change mySprite vy by (-200)** INSIDE the conditional block.



Then, in **Scene** select **is mySprite hitting wall [left]** and replace the “true” with it. To do this, drag the block over the word “true” and they will connect with a yellow line. When you let go of the block, it will snap into place and replace “true”. Be sure to change your sprite to your sprite’s name and select ‘bottom’ from the drop-down menu.

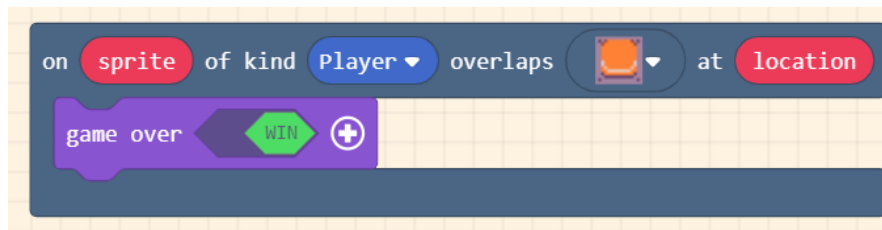
Now you will want to check and make sure that your character is able to jump up to each of your platforms! If your platforms are too high, you have two options: remake your tilemap, or play with the numbers used for gravity/jumping velocity so that your character can jump higher!

You Move, You Jump... Time to Win

Let's wrap this game up with a 'game over' condition. In **Scene** find the **on (mySprite) of kind [Player] overlaps [] at (location)** block. Set the block to be the button image that you used as your end tile.

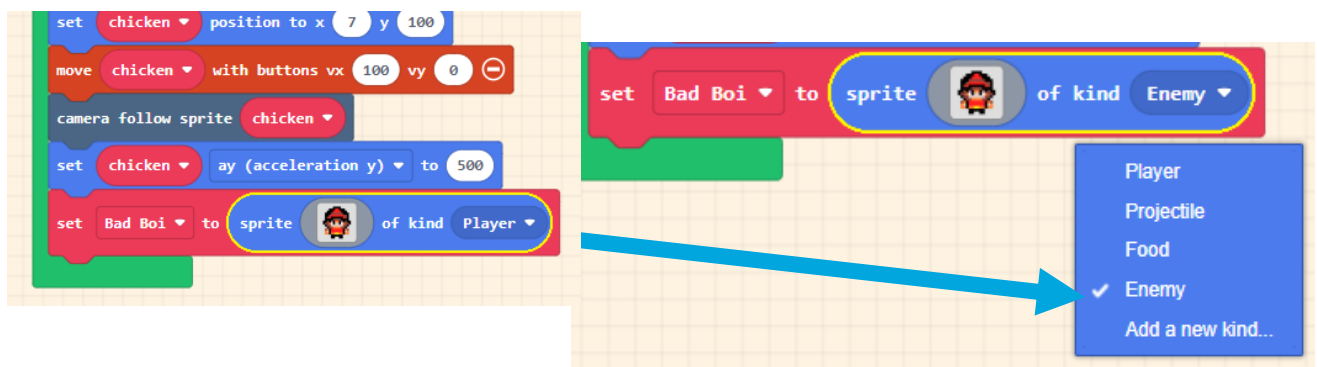


Add a game over block from the **Game** menu. Click on the word lose to change it to win!

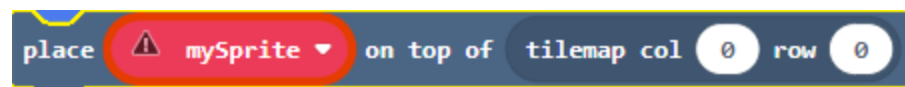


Adding some Difficulty

So far, your game is fairly easy, so let's add an enemy! First, find your **On Start** event block. This is where you will create your enemy. Next, go to **Sprites** and grab a **set mySprite to [] of kind player** and place it under the acceleration block. Change **Player** to **Enemy**, create a new variable to name your enemy, and then click the grey square to select or design an image.



To place your enemy on your map, repeat the same steps as placing your main character. From **Scene**



select **place mySprite on top of tilemap col 0 row 0** and add under the enemy creation block.

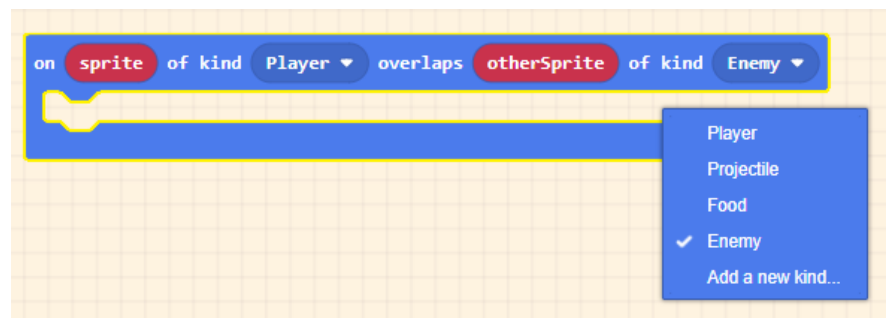
Open your tilemap and hover over the position you want your Enemy to start at. Look in the bottom left corner for the co-ordinates of this tile



Insert the desired co-ordinates into the **place mySprite on top of tilemap col 0 row 0** block.



To make your Enemy able to hurt your Player, you need to get an **On sprite of kind Player overlaps with other sprite of kind player** event block. Select **Enemy** from the second drop down menu.

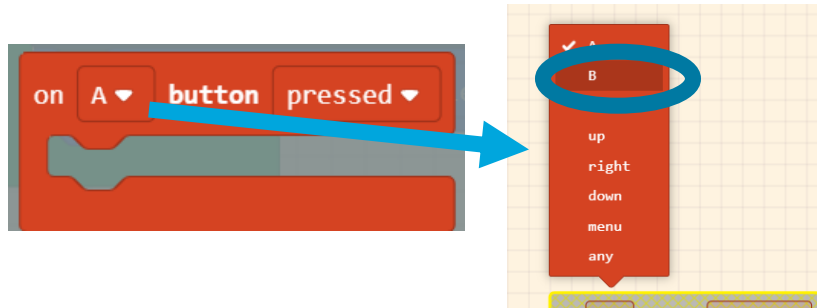


Once your enemy hurts you, you want to lose a life and go back to the start. Do this by selecting **change life by -1** from the **Info** menu. Then, find a **place mySprite on top of tilemap col 0 row 0** block. Insert the starting point co-ordinates (found in the Green on start block)



On the Defensive

The enemy can hurt your sprite, but you can't hurt it back... yet. To fix this, you're going to need another button. Go to the **Controller** menu and add an **on A button pressed block**. Change the **"A" to "B"**.



Next, go to the **Sprites** menu and select a **set [projectile] to (projectile []) from (mySprite) with vx (50) vy (50)** block.

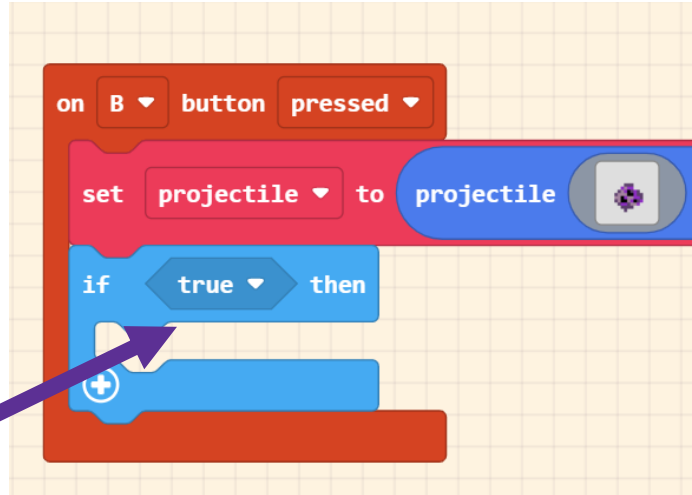
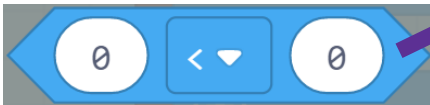


Change **mySprite** to your character sprite name. Click on the grey box and either make your own projectile sprite or get one from the Gallery. Change **vx to 200** (so the projectile moves to the side) and **vy to 0** (so the projectile does not go up or down)! Now your character can shoot when you press the B button (ENTER on your keyboard)!

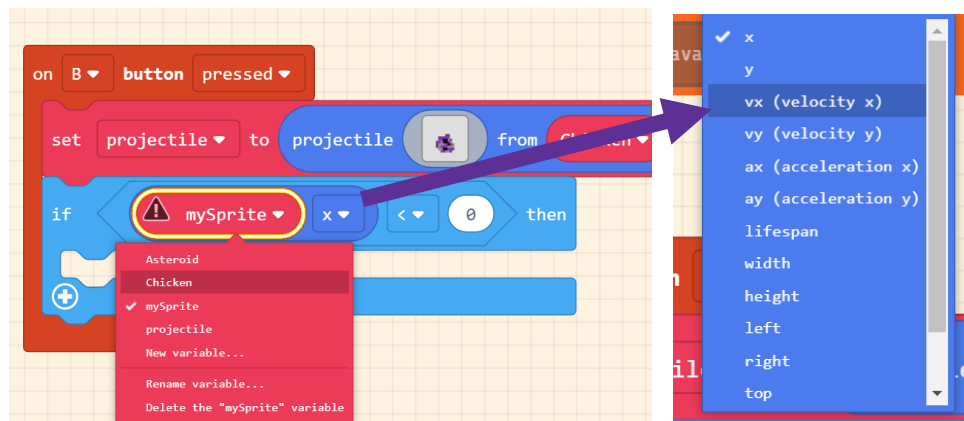


With this code, you can only shoot forward (to the right)! you will need to do something different if your character is moving towards the left. Let's start with a conditional to evaluate the direction your character is moving. First, add an **if <true> then** block from the **logic** menu.

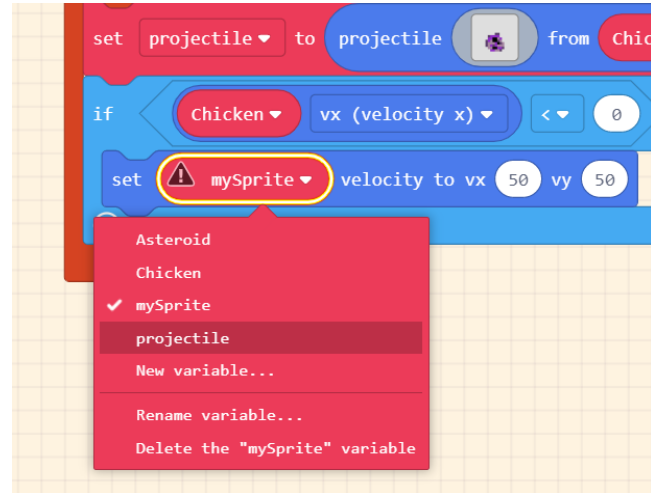
Next, go back to the **logic** menu and add a **<(0) [<] (0)>** comparison block



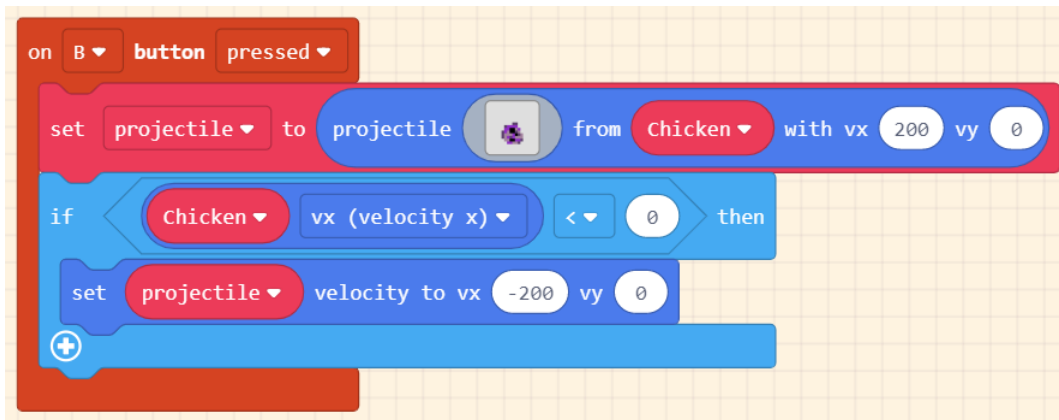
Grab a **(mySprite) [x]** block from the **Sprites** menu. Put it into the first 0 in the **<(0) <(0)>** block. Don't forget to change **mySprite** to your character name. Change **x** to **vx** (velocity x).



Now the conditional is evaluating if the character's velocity x is less than 0, which would make the character be moving to the left. To make the projectiles move to the left, go to the **Sprites** menu and select a **set (mySprite) velocity to vx (50) vy (50)** block and place it inside the conditional statement. Make sure to change the name from **mySprite** to **projectile**.

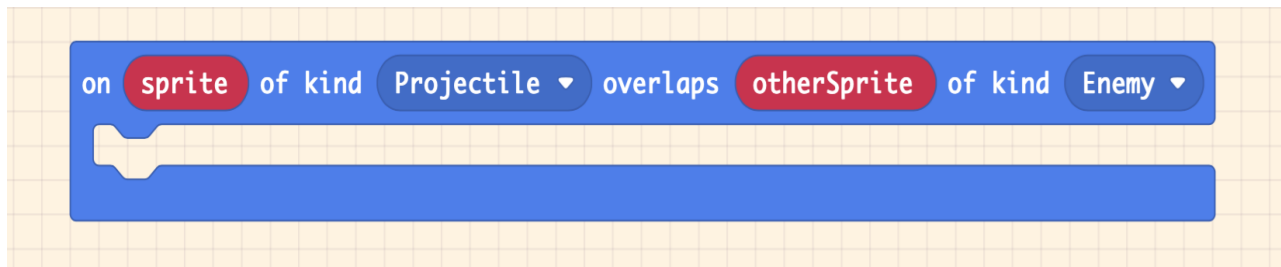


Next, to make the projectile move to the left change the **vx** to **-200** and **vy** to 0. Notice that the negative number goes left.



Now the projectile moves to the right if your character is moving right or standing still, but if you are moving left, then the projectile will move to the left instead!

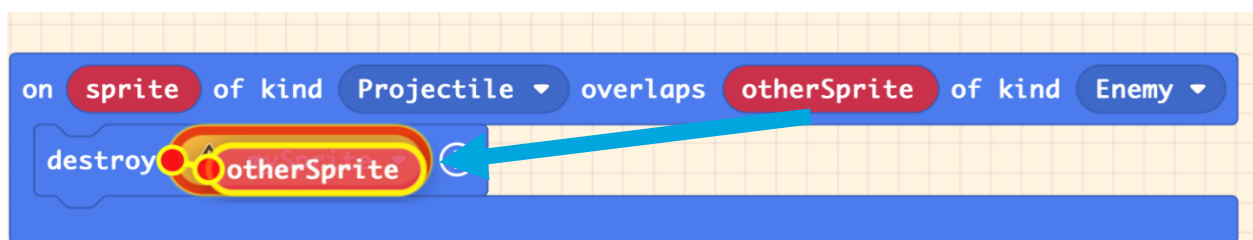
Now you need to make your **Projectiles** destroy your **Enemy**. Get an **on sprite of kind Player overlaps with other sprite of kind player** block from the **Sprites** menu. Change the **first player to say Projectile**, and the **second one to say Enemy**.



From **Sprites** select **destroy (mySprite)** and place it inside the overlap event block.



To make sure that the projectile is affecting the correct enemy sprite, click on the word **othersprite** and drag away from the event block. Then replace the word **mySprite** with the word **othersprite**. This will make it so that the enemy sprite that is hit by the projectile is the one destroyed, instead of the most recently created enemy sprite (which would happen if you create multiple enemies!)



There you have it! Try playing your game and don't forget to share it! 😊