

# MakeCode Arcade Challenges

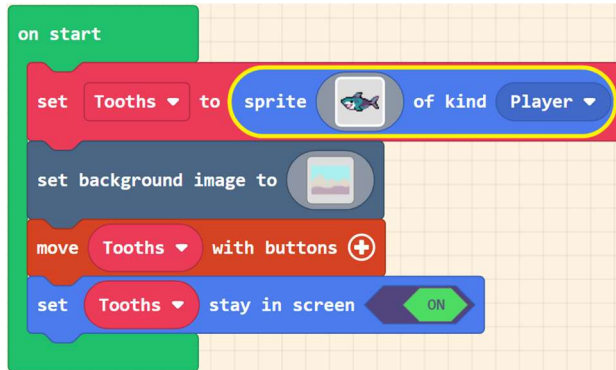
Pick one coding challenge from each row. Choose how spicy you'd like each challenge!

| Mild 🌶️   | Medium 🌶️🌶️  | Spicy 🌶️🌶️🌶️  |
|---|--|---|
| Change the game's sprites for the player and collectable (food) or make your own!                             | Animate your player sprite so it changes directions depending on which way you are moving.                                 | Create a super boss that appears after a certain number of enemies have been killed. How will you make your super boss tougher?           |
| Change the score needed to win and how fast your food appears.<br><br>Did it make your game easier or harder? | Add a projectile to defend yourself against enemies.<br><br>Remember it needs a way to fire and a way to hurt the enemies! | Make some of your collectables give you health or a super power like faster movement speed.<br><br>How long should your super power stay? |
| Add background music or sound effects to your game.<br><br>How can you get your music to repeat?              | Create a title screen and opening dialogue for your game.<br><br>Does your character say anything?                         | Create multiple levels using time, score, or enemy kills as the measure for the level change.   |

## Mild Challenges

### 1. Changing **Player Sprite**

- I. Click on the sprite image



- II. On the top of the new window, click on **Gallery**

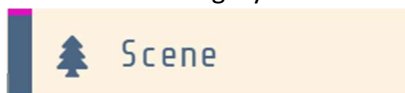


- III. Select your picture, then press **Done** in the bottom right corner.

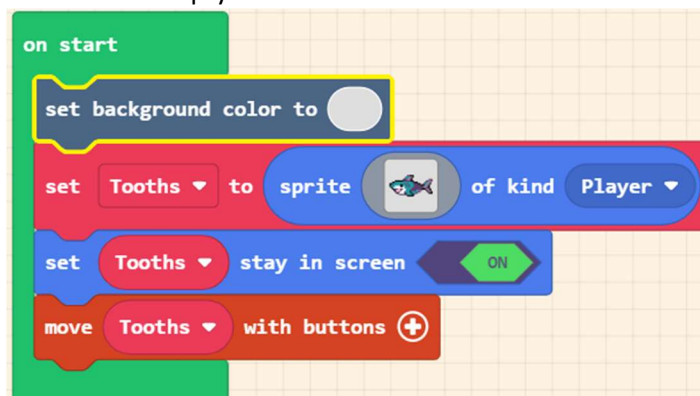


### 2. Changing the game **Background Colour**

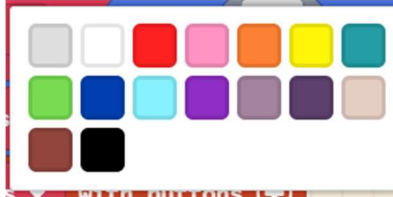
- I. In the **Scene** category



- II. Click on the empty icon beside **colour to**

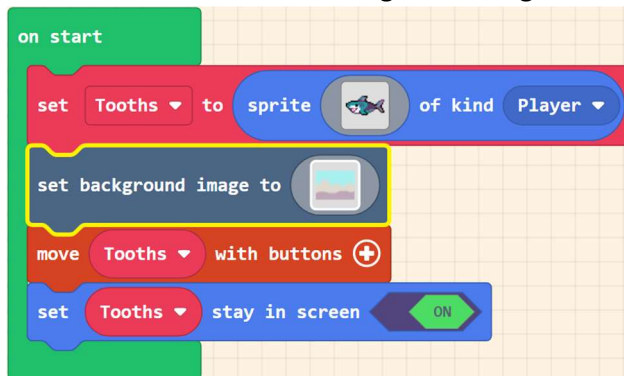


- III. Select a desired colour for the background from the drop-down menu.

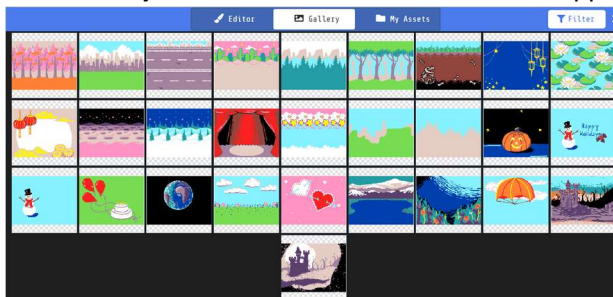


### 3. Changing the **Background Image**

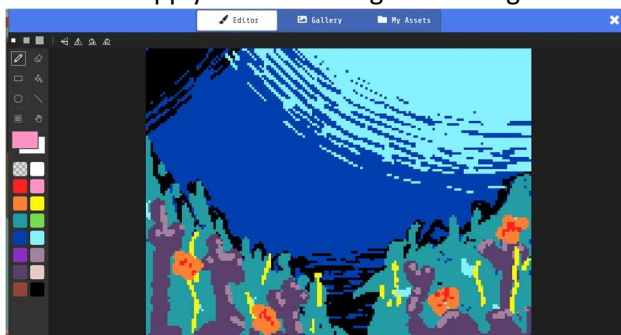
- I. Click on the icon of the **set background image to**



- II. Click **Gallery** in the new window and select an appropriate **background image**



- III. You will end up back to the **Editor** window. Select **Done** on the bottom right corner of the window to apply the new background image.



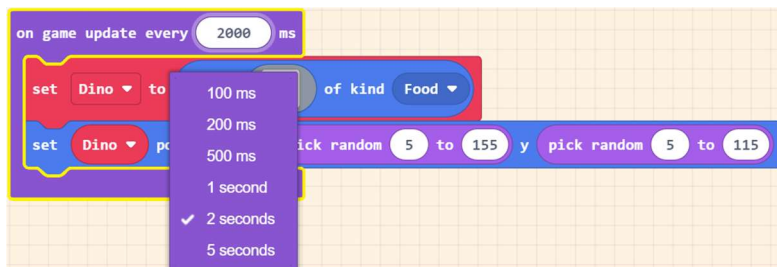
4. Changing the **score** needed to win
- I. Look for the pink block **on score 25**



- II. Click on the white bubble with the number 25 in it. Change the number to be higher or lower.

5. Make collectables appear **faster**

- I. The **on game update every 2000 ms** block, change the value for ms to any number lower than 2 seconds

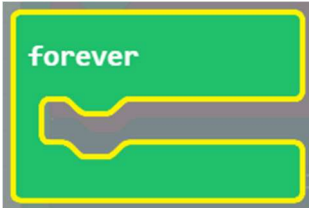


6. Adding **music** to your game

- I. Select the **Loops** category



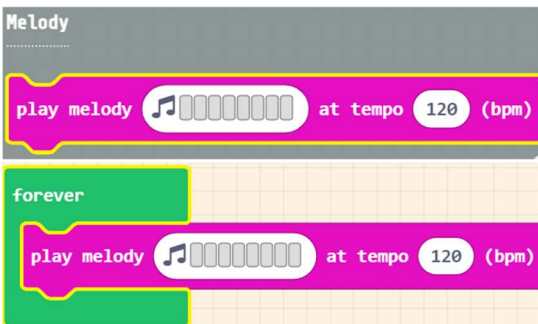
II. Drag the **Forever** code block into an empty space



III. Select the **Music** category



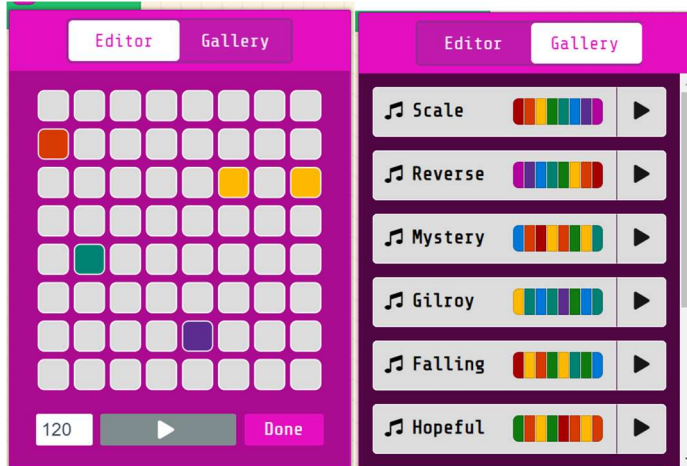
IV. Drag the **Play Melody at tempo (120)(bpm)** from the **Melody** subcategory into the **Forever** code block



V. Click on the box that contains the music note



- VI. Create your own melody by clicking on the squares in the **Editor**



You can also select pre-set melodies located in the **Gallery** option

the melody should now play throughout the entire game!

## Medium Challenges

### 1. Animating your player Sprite

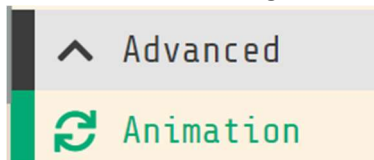
- I. Click on the **Controller** category



- II. Click and drag the **On [A] button [pressed]** code block.

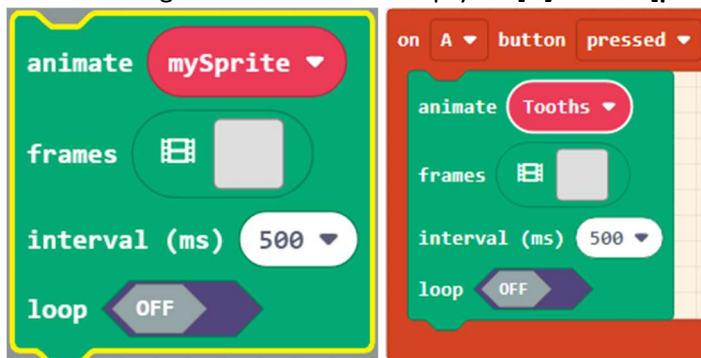


- III. Click on **Advanced** to gain access to more categories.



Then click on **Animation**.

- IV. Click and drag this code into the empty **on [A] button [pressed]** code block.



**NOTE:** Ensure you change the **mySprite** variable to **the name of your character** so that we animate the **player** sprite

- V. Select the empty image box beside **frames**.



- VI. Click on **Gallery**.



**NOTE:** Filtering the gallery will remove the animated sprites.

- VII. Scroll down the menu and look for an animation for your chosen sprite. Most sprites have animations already created. Select this animation and click **Done**.

**NOTE:** If the chosen sprite does not have an animation, you can draw your own frames and make one within the edit window.



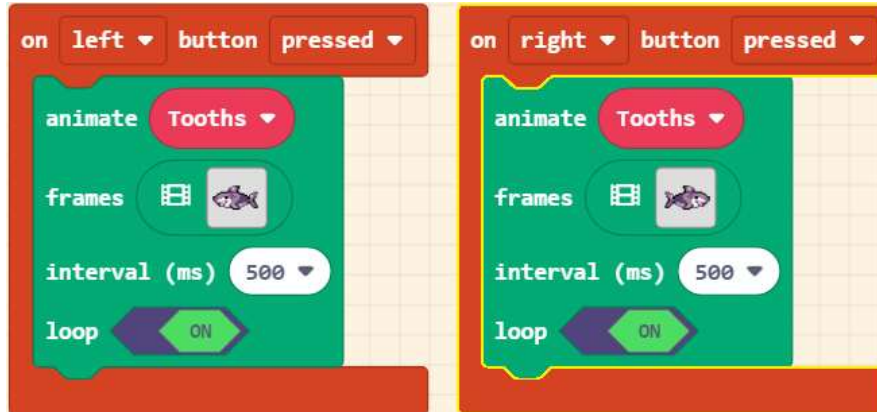
**NOTE:** Hovering over the sprite with your mouse will give you a preview of the animation.

Switch **Loop** → **On** and change the **[A]** variable to **[Left]**



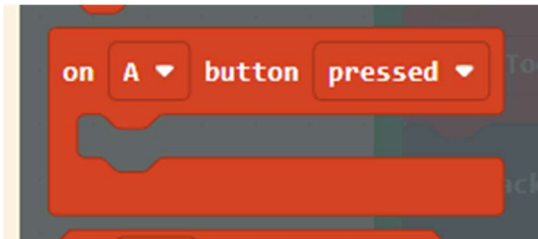
**NOTE:** Changing the interval of the animation will change the speed of the animation.

VIII. Repeat this process for the **Right** so that the shark is animated for each direction.



## 2. Adding PROJECTILES

I. In the controller menu, find the **On [A] button [pressed]** block. Place it in a new space.



II. Under sprites, find the projectiles section and put the **set [projectile] to (projectile [ ] from [mysprite] with vx50 vy50)** block inside.



III. Choose your sprite for your projectile, and change the **[my sprite]** variable to your character sprite name.

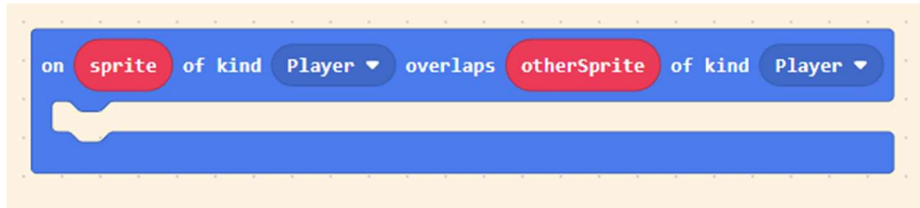


IV. Change the vy velocity to 0 to make the projectile shoot to the right.

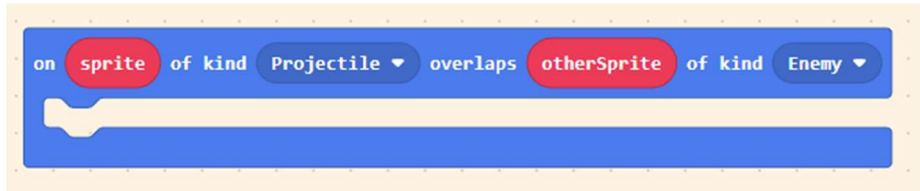


NOTE: If you created an animation to change the direction of your sprite, you may need to add an **if, then, else** block to have the projectile move in either direction. Movement to the left needs a negative number (-50).

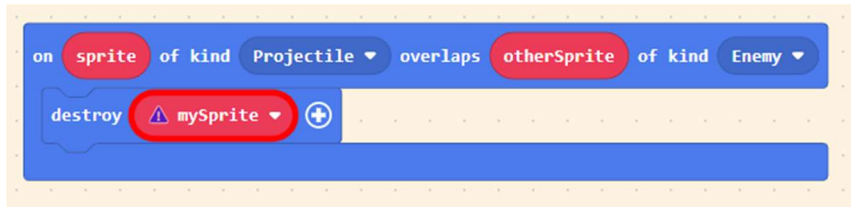
- V. Find a new overlap block.



- VI. Change it to read **on [sprite] of kind [projectile] overlaps [othersprite] of kind [enemy]**.



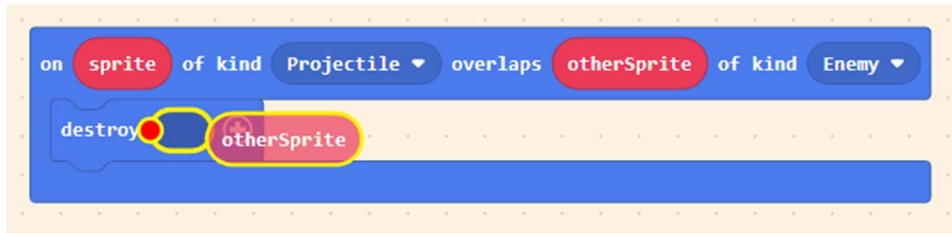
- VII. From the player menu find a **destroy[mysprite]** block and place it inside the overlap.



- VIII. Remove and delete the **[mysprite]** bubble.



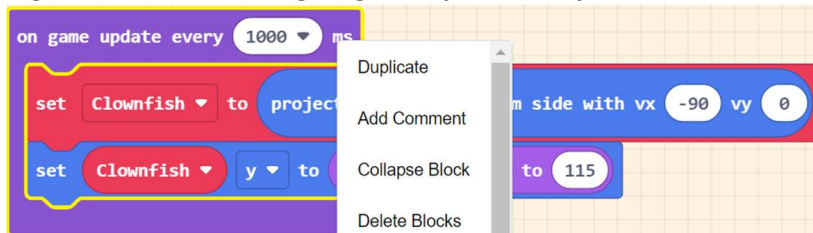
- IX. Drag the **[othersprite]** bubble down to create a copy and place it inside the hole we made by removing the **[mysprite]** bubble.



X. Bonus: Add a **change score by** block to give a point for killing an enemy.

### 3. Adding DANGERFOOD (Bad collectables)

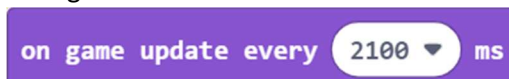
I. Right click on the existing **on game update every (1000) ms** container and click **duplicate**



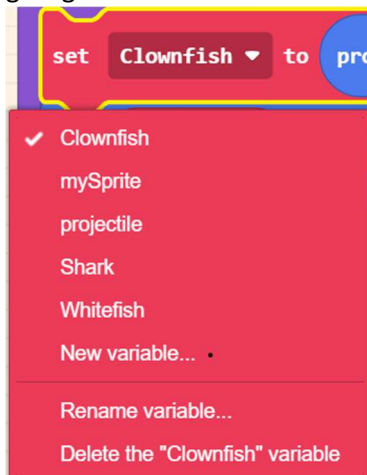
II. Change the fish sprite to a different sprite of your desire to represent your DangerFood (Ex., Snake)



**NOTE:** You can change the rate of which the snakes will spawn by changing the **ms** value  
Change the **ms** value to **2100 ms** in this activity



- III. Change the **Clownfish** variables for BOTH blocks to **Snake** by clicking **Rename variable** and giving it a new name like “Snake”



- IV. Setting the snakes to damage your sprite  
Click on **Sprites**

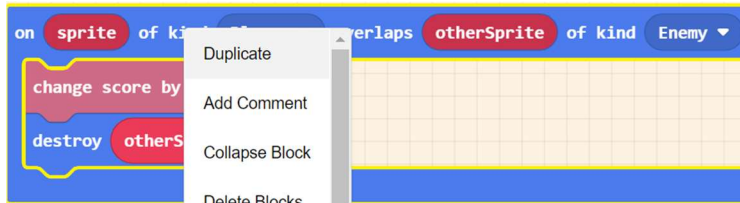


Scroll to the **Overlaps** subcategory and drag the **set (mysprite) kind to (Player)** block to the **BOTTOM** of the **on-game update every (1000) ms**



Change the **mySprite** variable to **Snake** and **(Player)** option to **(Enemy)**. OR, make a new kind with a different name such as “**DangerFood**”.

- V. Right click an existing **on(sprite) of Kind (otherSprite) of kind (Enemy)** container and click **Duplicate**

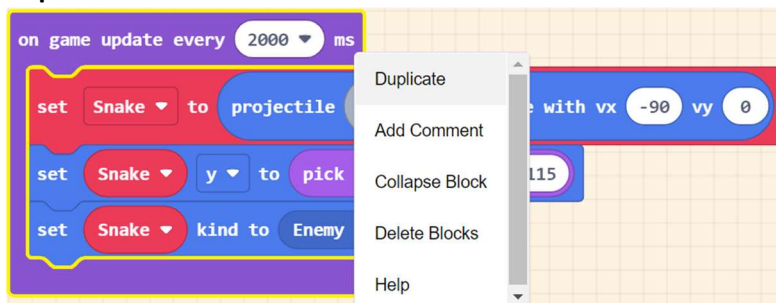


Instead of “change score by 1”, set it to “change score by -1” so that the DangerFood will decrease your score.

OR create a “change *life* by -1” block to have your DangerFood take away lives instead of points.

4. Adding SUPERFOOD (Rare collectables that greatly increase the score)

- VI. Right click on the existing **on game update every (1000) ms** container for the **snake** and click **duplicate**

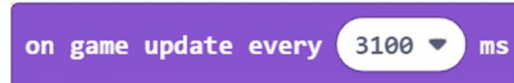


- VII. Change the **Snake** sprite to a different sprite of your desire to represent a SUPERFOOD Ex. Whitefish

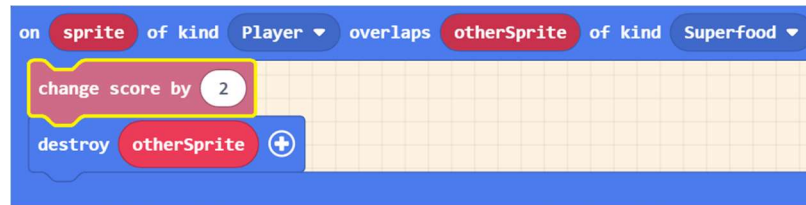


Change the **Snake** variable to **Whitefish**. Click the existing **Enemy** drop down menu, click **Add a new kind...** and create a **Superfood** kind.

Change the value of **on game update (2000) ms** to **3100 ms**. We want our superfood to be rare, so it should appear less frequently!



Right click an existing **on (sprite) of kind (player) overlaps (otherSprite) of kind (Player)** block and change the second **player** dropdown menu to **Superfood**.



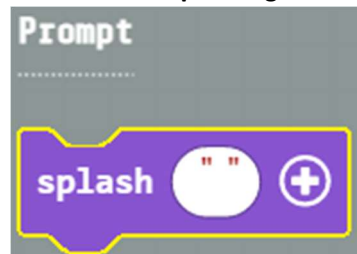
Change the **change score by (1)** value to a **number larger than 1** so that the SUPERFOOD will add more points to the score.

## 5. Create a Title Screen OR Opening Dialogue

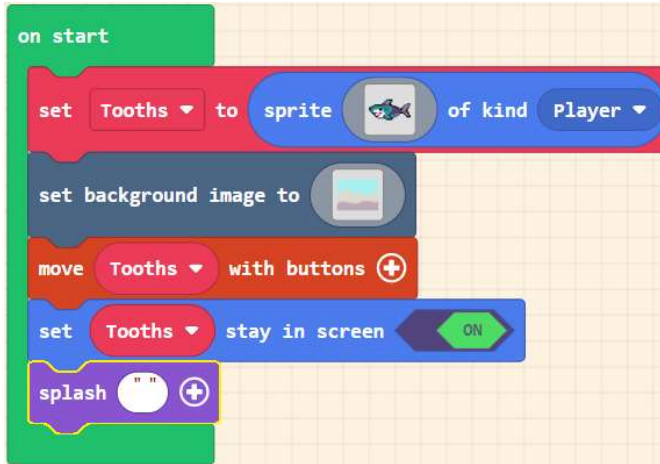
- I. Select the **Game** category



- II. Scroll to **Prompt** and grab the **Splash (" ")** code block



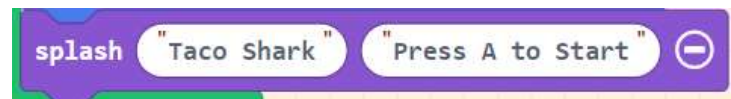
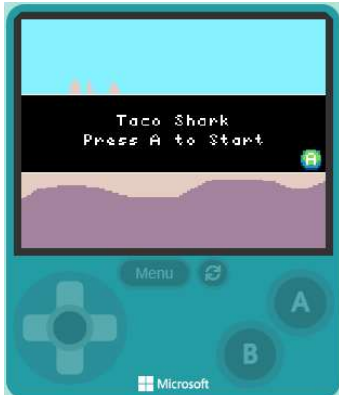
Drag it into the **end** of the **On Start** container



- III. Click on the bubble containing quotation marks and type an appropriate opening dialogue or Title Screen that you will see at the beginning of your game



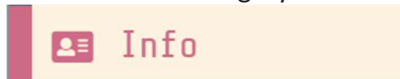
**NOTE:** Clicking the (+) will add 1 more line of text



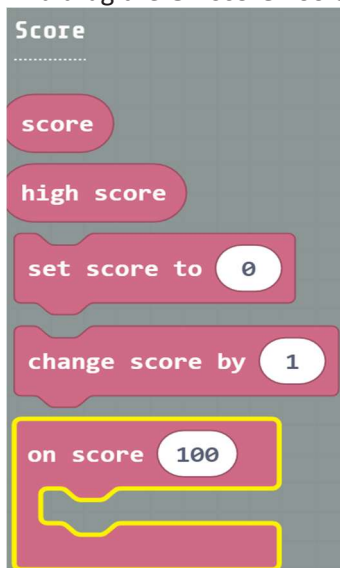
## Spicy Challenges

Create a super boss that appears after a certain number of enemies are killed.

- I. Select the **Info** category



And drag the **On score 100** code block into the board



- II. Create a new **boss sprite** using this code



drag this code into the **On score 100** code block.



Create a new variable **BossSprite**, a new kind **Boss**, select an appropriate boss sprite, and change the score to 5 (or whatever score you want the boss to appear at)

- III. Next, we want to position the boss sprite on the far left of the screen. Select the highlighted code from the **Sprites** category.

```

Physics
-----
set mySprite velocity to vx 50 vy 50
set mySprite position to x 0 y 0
  
```

drag it to the **bottom** of the **on score** code block.

```

on score 5
  set BossSprite to sprite [Boss] of kind Boss
  set BossSprite position to x 5 y 50
  
```

Adjust the X and Y values accordingly.

- IV. Select **Variables**



Drag this code to the bottom of the **on score** code block

```

set BossAttack to 0
  
```

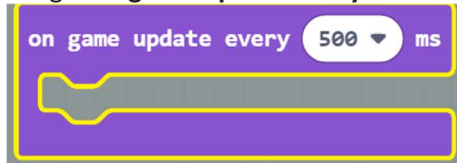
Create a new variable **BossAttack** and change the value from 0 → 1

```

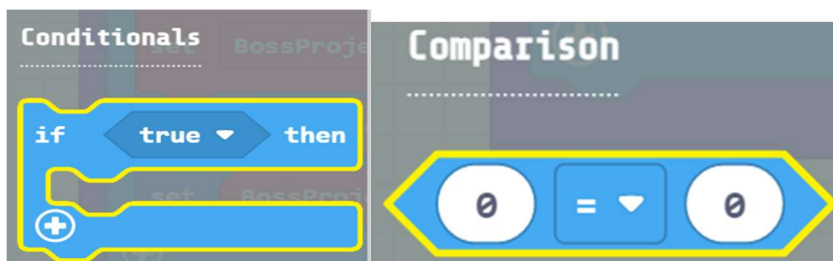
on score 5
  set BossSprite to sprite [Boss] of kind Boss
  set BossSprite position to x 5 y 50
  set BossAttack to 1
  
```

- V. Now, to create projectiles coming from our Boss Sprite.

Drag a **on game update every 500ms** code block.



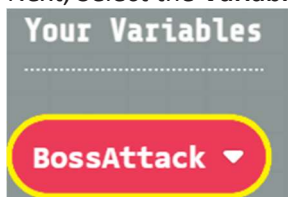
- VI. Select the **logic** category and drag the **if <true> then** code block and a comparison block with the '=' sign



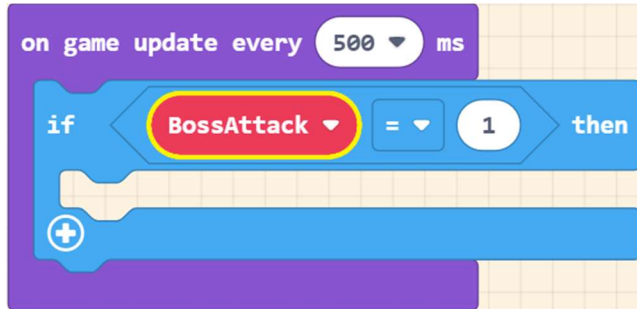
Drag the **if <true> then** code into the **on game update** code block and drag the **comparison block** into the **<true>** block. Change the 0 on the right to **1**



Next, Select the **Variable** category and select the **BossAttack** variable from **Your variables**



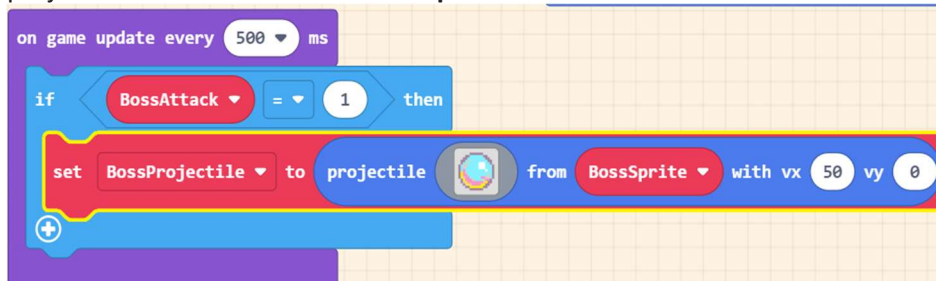
Drag this variable into the left side of the equal sign as seen below.



```

on game update every 500 ms
  if BossAttack = 1 then
  
```

- VII. Set the Boss projectile by create a new variable **BossProjectile**. Select an appropriate boss projectile that will come from **BossSprite**



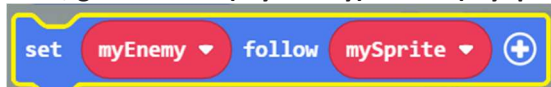
```

on game update every 500 ms
  if BossAttack = 1 then
    set BossProjectile to projectile from BossSprite with vx 50 vy 0
  
```

Ensure the **vx** is 50 and the **vy** is 0

**NOTE:** You can adjust the speed of the projectile by changing the **vx** value

Next, grab the **set (myEnemy) follow (mySprite)** code block inside of the **if then** code block



```

set myEnemy follow mySprite

```

We want the Boss projectiles to follow Toths. Change the first variable to **BossProjectile** and the second variable to **your player sprite's name**.



```

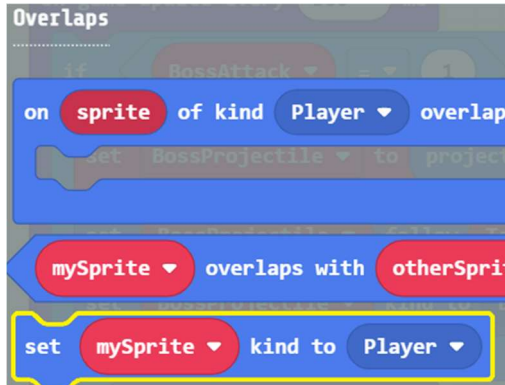
on game update every 500 ms
  if BossAttack = 1 then
    set BossProjectile to projectile from BossSprite with vx 50 vy 0
    set BossProjectile follow Toths with speed 50
  
```

**NOTE:** By clicking the (+) of the allows you to adjust for the speed of the Boss projectiles

 to adjust for speed.

- VIII. Lastly, we want the Boss Projectiles to delete when we shoot them with our own projectiles. This code will cause the Boss projectiles to follow your player sprite as it moves.

In the **Sprites** category, select **set (mySprite) kind to (player)** found in the **Overlaps** subcategory.

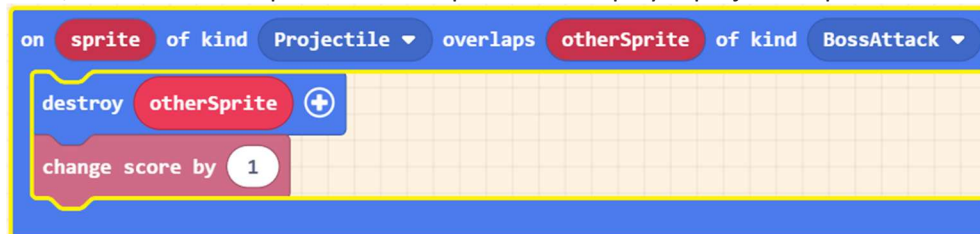


Drag this into the **if <(BossAttack) = (1)> then** code block.



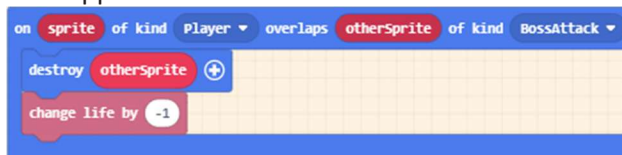
Change the variable to **BossProjectile** and create a new **kind BossAttack**

- IX. Next, create an overlap for the boss sprite and the player projectile sprite.

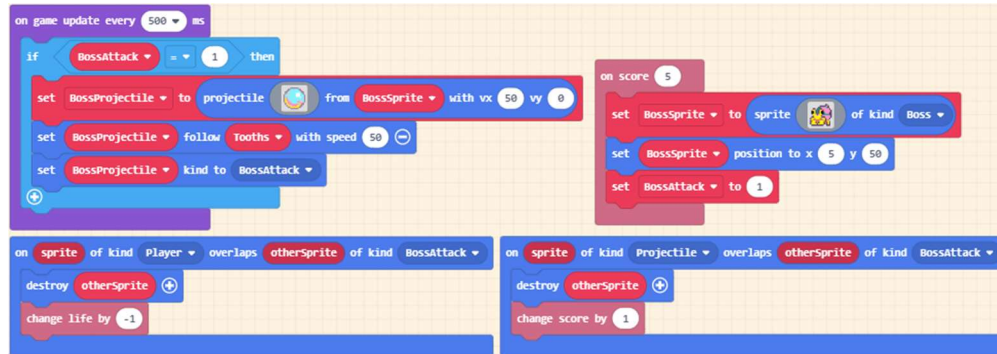


Change the last **kind** to **BossAttack**. When Toths' projectile sprite overlaps with the Boss projectile sprites, this will delete the Boss projectiles and add a point to our score.

- X. Create another overlap code with the **player** and **bossattack** so the player sprite will lose a life if overlapped



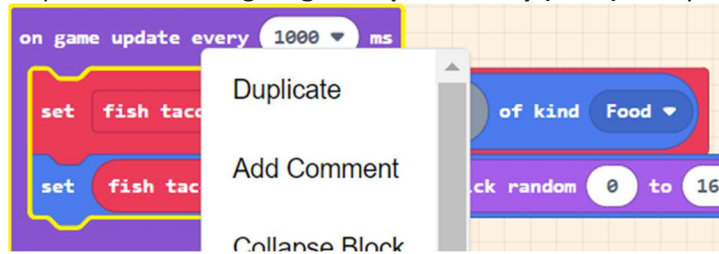
### Final Boss Code:



The code consists of several blocks:

- on game update every 500 ms**
  - if BossAttack = 1 then**
    - set BossProjectile to projectile from BossSprite with vx 50 vy 0**
    - set BossProjectile follow Tooth with speed 50**
    - set BossProjectile kind to BossAttack**
- on score 5**
  - set BossSprite to sprite of kind Boss**
  - set BossSprite position to x 5 y 50**
  - set BossAttack to 1**
- on sprite of kind Player overlaps othersprite of kind BossAttack**
  - destroy othersprite**
  - change life by -1**
- on sprite of kind Projectile overlaps othersprite of kind BossAttack**
  - destroy othersprite**
  - change score by 1**

2. Make some of your collectables give you health or superpowers like faster movement.
  - I. Duplicate an existing **on game update every (1000) ms** by right-clicking on the code block.



The screenshot shows a code block: **on game update every 1000 ms** containing **set fish taco to sprite of kind Food** and **set fish taco position to x pick random 0 to 160 y pick random 0 to 160**. A context menu is open over the block with options: Duplicate, Add Comment, and Collapse Block.

- II. Change the sprite into an appropriate enemy sprite and the variable to a heart sprite and change the spawn rate to **5000 ms**

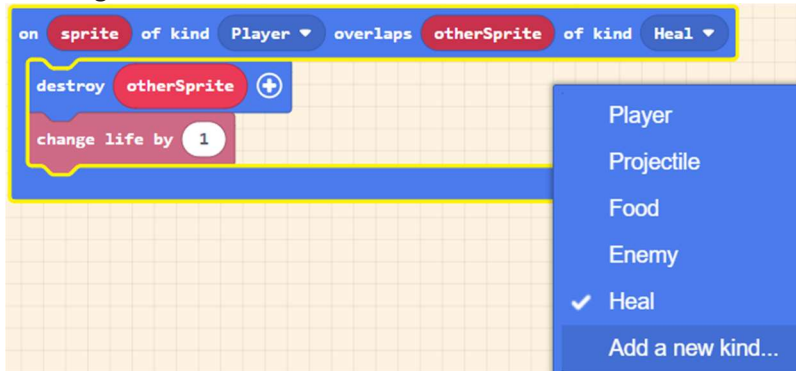


The screenshot shows the modified code block: **on game update every 5000 ms** containing **set Heal to sprite of kind Enemy** and **set Heal position to x pick random 0 to 160 y pick random 0 to 120**.

Create a new sprite kind called **Heal**.

- III. Duplicate an existing **on sprite of kind (player) overlaps (othersprite) of kind (Food)** by right clicking it and selecting duplicate.

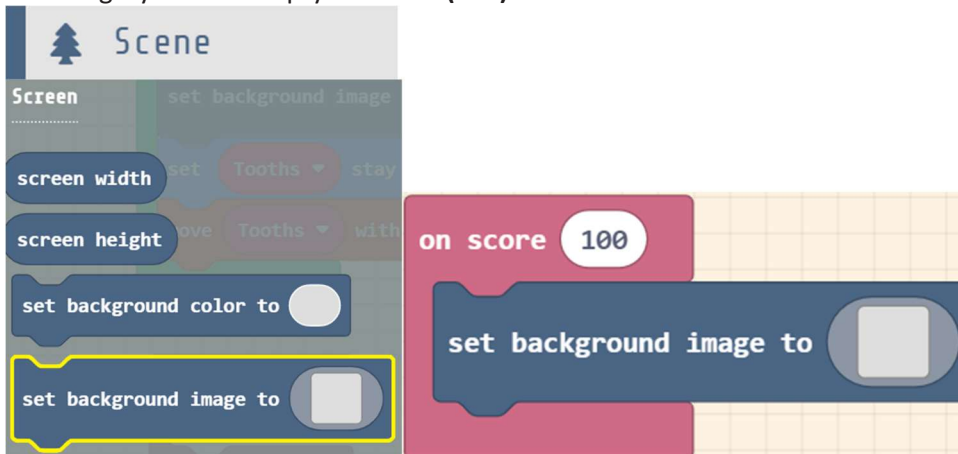
- IV. Add a new **kind** to replace the **Food** kind. Name the new **kind** to **Heal**, or another name such as “Healing Food”



Change the **change life by 1** value to **2** as seen above.

3. Create multiple levels using time, score, or enemy kills as the measure for level changes.

- I. On the **Scene** category, click and drag the **Set background image to ( )** code block in the **Scene** subcategory into an empty **On score (100)** Code container.



- II. Change the score from **100 --> 25** AND change the background image to the desired image.



Now your background will change when you reach a certain score! This is like entering a new level of the game. You can also add other changes to this block – maybe different enemies appear on level 2.

To make even more levels, duplicate this code and change the score needed to go to the next level. Pick another background image and repeat.