Loops Mini Lesson

Summary

In this lesson, students will learn the important role of loops in code. We will use loops to create enemies that continually spawn as well as collectables that can earn points!

Background

Loops in coding are a way to take code that has a repeating pattern and shorten and simplify it. Some loops have a set amount of repeats before a condition is met. Others continue indefinitely.

Materials

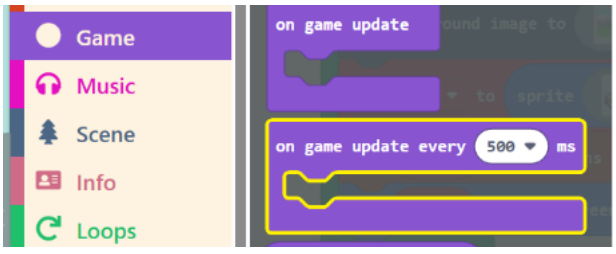
Chromebooks

Lesson

Coding Collectable and Enemy Spawns: (20 Minutes)

Today we are going to use special types of loops to cause enemies and collectables to spawn. These special loops are called "On game update" blocks. They are event blocks that go in their own separate space in your workspace.

From the game menu, find the "On game update 500ms"



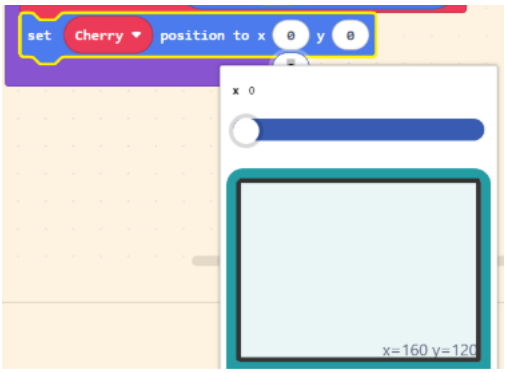
Ask students if they can guess what 500 ms might mean. After the guess, explain that it will control how often the loop repeats the commands inside. The slower the collectables appear, the more challenging the game is.

Next, from the sprite menu, get a new "Set mySprite" block. Have students pick a new image and give it a name. The new thing, is students must change their type to "food."

Now the collectable sprite should be appearing in the centre of the screen. Explain that it looks like there is only 1, but they are all spawning in the same spot. We have to code them to change locations.

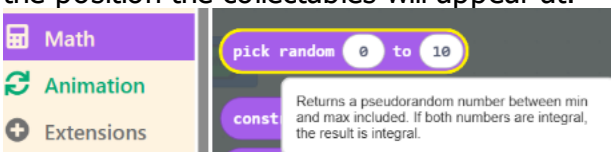
From the sprite menu, find the "set mySprite position" block, 4th from the top. Put it underneath your food sprite block. Make sure to change the variable name to match. Now your food should be appearing in the top left corner.

To make them pop up randomly over the screen, we need to add a couple more blocks and know our screen size. If you click on the 0 in the position block, a window will pop up. Show students how each spot on the screen is a coordinate, and we can find the size of the screen.



The screen is 160 pixels across, and 120 down.

From the math menu, find the pick random. Explain how this block isn't a puzzle shape, so it must fit inside another block of the same shape. This will allow the computer program, not us, to pick the position the collectables will appear at.



Once in the set position block, change the max value from 10 to 160 and 120 respectively.

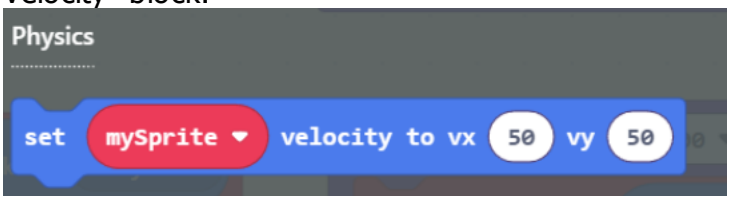
Now our collectables should be popping up randomly around the screen. We can move our character to them, but nothing else happens. Perfect!

Next, we will duplicate this block to create enemies. Show students how to right click on the game update block. The first option in the menu will be duplicate.

Click and a new block will appear. In this new block, we need to change our set mysprite. We have 3 things to change: The name, the picture and the kind to enemy. Give students a few minutes to do these 3 things.

Next, we need to change the variable on the position block to be our enemy character. We are also going to change the position. We are going to make the enemies appear at the top, then rain down. To do this, we will keep the pick random block on the x direction, and delete it from the y direction.

Lastly, we will give the enemies some velocity. From the Sprites menu, find the "Set mySprite Velocity" block.



Put it in our enemy on game update block and change the variable to be your enemy's name.

Now the enemies should be flying sideways. This is because they have velocity in both the x direction and y direction. To make them rain down, take away the x velocity.

Allow students some time to pick how fast they want their enemies to rain down, as well as how fast they want their enemies to spawn by changing the ms. As an added bonus, students can also put a pick random block in the velocity block so the enemies move at random speeds.


on game update every 1000 ms
set Ghost to sprite of kind Enemy
set Ghost position to x pick random 0 to 160 y 0
set Ghost velocity to vx 0 vy 50

Or:


on game update every 1000 ms
set Ghost to sprite of kind Enemy
set Ghost position to x pick random 0 to 160 y 0
set Ghost velocity to vx 0 vy pick random 20 to 100