

MOONHACK

— MOONHACK 2018 GAMEFROOT PROJECT —

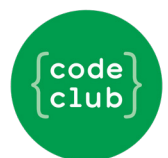


INTRODUCTION

While the difficult task of landing on the Moon was an important step in space exploration, travelling further through the solar system has its fair share of risks. Our solar system has hundreds of thousands of asteroids filling the space between the orbits of Mars and Jupiter, and the total number may range in the millions or more. Fortunately all 12 spacecraft that have travelled through the asteroid belt have made it safely through.

In this activity we are going to make a game out of dodging asteroids. Follow the instructions below to create your own Asteroid Dodger Game.

Is this your first time using Gamefroot? This [guide](#) introduces coding with Gamefroot.



STEP 1: CONTROLLING THE SPACESHIP

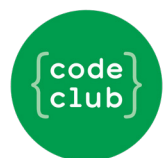
Let's start by creating code that will let us steer the spaceship left and right.

Activity Checklist

- Open the Moonhack 2018 Gamefroot project online at <http://make.gamefroot.com/games/remix/101981>
- Add a script to the spaceship by right-clicking on it and clicking "Add Script".
- The first block we'll use is from "Events" and is named "When backspace/delete pressed". Drag this block into the workspace. To detect when the right arrow key is pressed, click "backspace/delete" and change it to "right arrow":



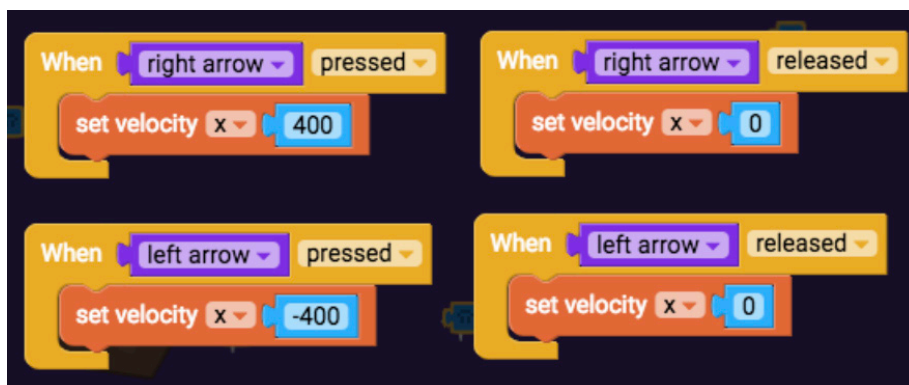
- To make the ship move to the right, add "set velocity x to 0" from "Physics", and change 0 to 400.



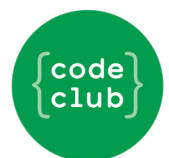
- Right-click on the first block and select “Duplicate” to make a copy. Change the copy to say “When left arrow pressed, set velocity x -400”:



- Duplicate both of these blocks and click on “pressed” to change it to “released”. Set the x velocity to “0” in both blocks.



- Test out your code by clicking the orange Play button (you should name your script “Spaceship”, then click Done to play). Does the ship move left and right when you press the arrow keys?

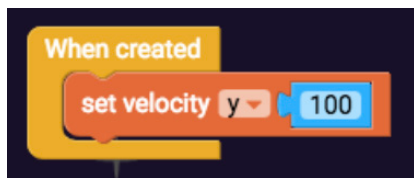


STEP 2: INCOMING ASTEROIDS!

Now we are going to program the asteroids to hurtle towards you.

Activity Checklist

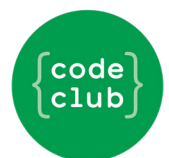
- Close the spaceship script, and edit the script on an asteroid by right-clicking on one of them and selecting “Edit script”.
- Make the asteroids move downwards by giving them a y velocity of 100. You can change the velocity direction by clicking on “x” and changing it to “y”.



- Lastly, we are going to make the spaceship detect when it is hit. Close the asteroid script, and edit the script on the spaceship. Open “Physics” and drag “When I am touched get toucher” into the workspace. Open “Control Flow” and drag “go to next level” into the previous block. Click on “next” and change it to “current”.



- Click Play to test your program. You probably have a spaceship which can dodge incoming asteroids. Next we are going to improve this game by making the asteroids reappear at the top.

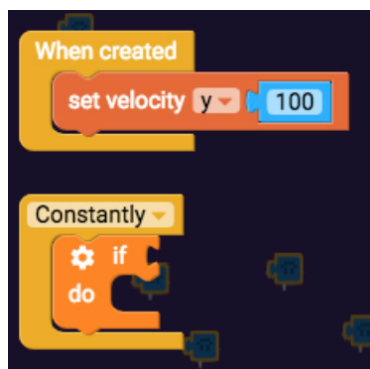


STEP 3: INFINITE ASTEROIDS

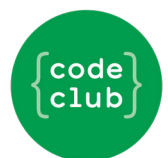
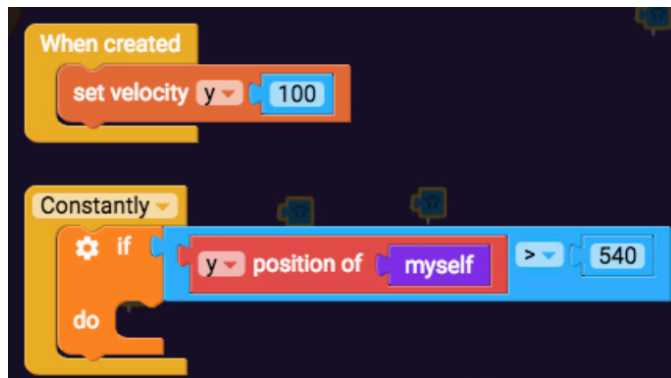
Now that the spaceship has dodged the first few asteroids, we need to keep up the pressure.

Activity Checklist

- We are going to create a conditional statement that states if an asteroid has moved below the bottom of the game, it will reposition itself to the top. Edit the asteroid script and use a “Constantly” block (from Events) combined with an “if do” block (from Control Flow).



- Make this if-statement check if the y position of the asteroid is larger than the height of the game (which is 540 pixels). Connect “_=_” (from Operators) onto the “if do” block. Click on “=” and change it to “>”.
- Drag “x position of myself” (from Transform) into the left slot. Click on “x” to change it to “y”. Drag “0” (from Operators) into the right slot. Change “0” to “540”.



- Open "Transform" and drag "set x position of myself to 0" into the "if do" block. Change "x" to "y" and change "0" to "-100".



- Test your code. Do the asteroids reappear at the top?

STEP 4: RANDOM POSITIONS AND FASTER SPEEDS

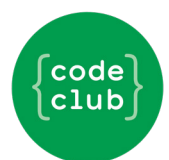
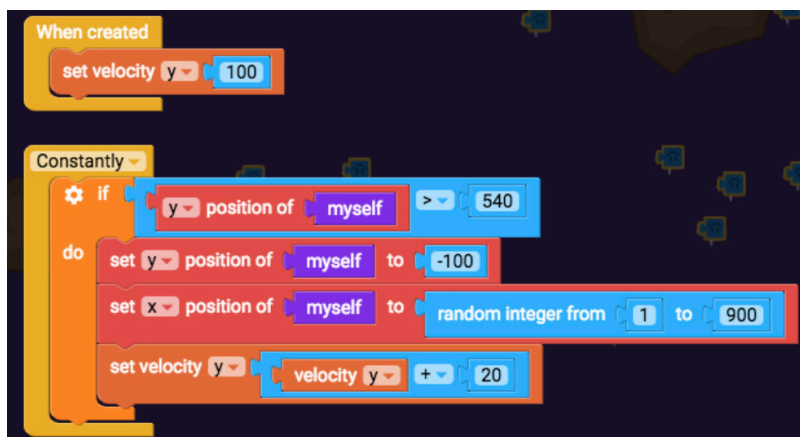
We are going to make this game more challenging by randomly positioning the asteroids and making them go faster.

Activity Checklist

- Use “set x position of myself to 0” (from Transform) to reposition the asteroid if it goes beyond 540 pixels.
- Next, replace that “0” with “random integer from 1 to 100” (from Operators). Change “100” to “900”.



- Lastly, drag “set velocity x 0” under “set x position” inside the “if do” block. Change “x” to “y”.
- Drag “_+_” (from Operators) into where the “0” block is to replace it. Drag “velocity x” (from Physics) into the left slot. Change “x” to “y”. Grab “0” (from Operators) and put it in the right slot. Change 0 to “20”.



CONGRATULATIONS!

You have completed the Moonhack Gamefroot project of 2018!
Celebrate by inviting your friends and family to have a go at your new Asteroid Dodger game.

Now that this project is done there are so many other things you can do.

Extra Activities

- Have a go at the Moonhack Scratch or Python project.
- Create your own “Moon” themed project in Scratch, Python or HTML/CSS!
- Land the Lunar Module with the Moonhack Micro:bit project.

