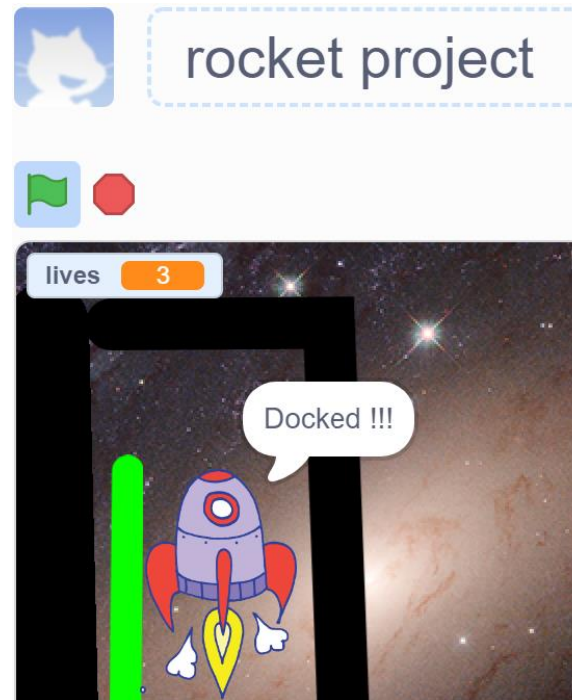


Understanding the Rocket SIM

- a scratch project with real Physics



Speed variables and movement

When the left arrow is pressed the X_Speed variable is changed by -0.1

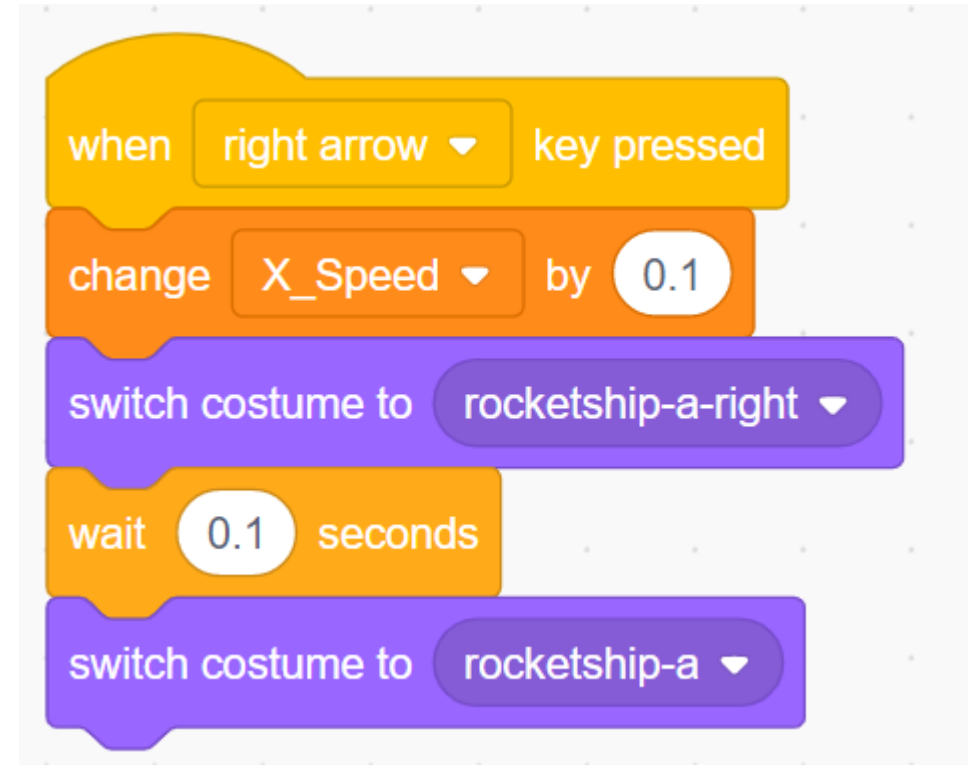
In the move block the X_Speed variable is used to change the x (horizontal) position of the rocket ship.

The image displays two parts of the Scratch interface. On the left, the 'Variables' panel is open, showing a list of variables: 'lives' (checked), 'my variable', 'Spins', 'Spins Delay', 'X_Speed' (checked), and 'Y_Speed' (checked). At the bottom of this panel, there is a 'set lives to 0' block. On the right, a script area shows a 'define move' block containing a 'forever' loop. Inside the loop, there are three blocks: 'change x by X_Speed', 'change y by Y_Speed', and a 'detect' block. Below the loop, there is a 'when left arrow key pressed' block followed by a 'change X_Speed by -0.1' block.

The costumes

When the right arrow is pressed the right costume will display for 0.1 seconds

The rocketship-a-right costume will have a puff of gas going to the left to simulate the rocket using its thruster to push it right.



Detection (sensing)

The detect block is defined here but is called from inside the move block loop so sensing happens after the rocket ship has moved.

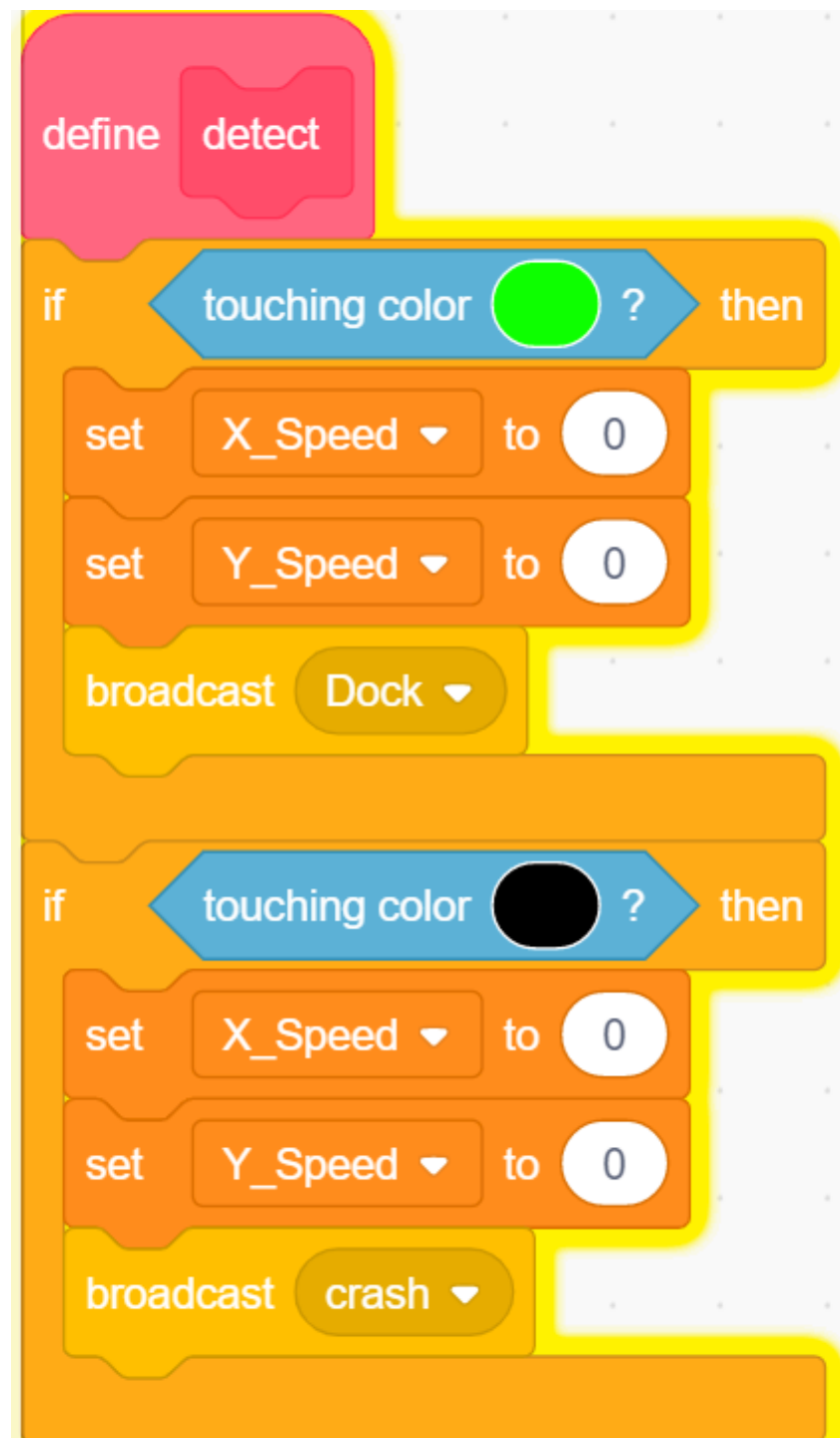
If green is detected then Dock is broadcast.

If black is detected then crash is broadcast.

Does the broadcast...

Appear as a message for the player? ❌

Get received by the project objects? ✅



```
define detect
  if touching color green ? then
    set X_Speed to 0
    set Y_Speed to 0
    broadcast Dock
  if touching color black ? then
    set X_Speed to 0
    set Y_Speed to 0
    broadcast crash
```

The image shows two Scratch code blocks. The top block is a 'define detect' block. It contains an 'if touching color green ? then' block. Inside this 'if' block, there are two 'set' blocks: 'set X_Speed to 0' and 'set Y_Speed to 0'. Below these is a 'broadcast Dock' block. The bottom block is another 'if touching color black ? then' block. It also contains two 'set' blocks: 'set X_Speed to 0' and 'set Y_Speed to 0'. Below these is a 'broadcast crash' block.

Adding more

This dock sprite script makes the dock change to costume2 when it receives the Dock broadcast.

The broadcast could also be used to signal the start of level 2 of the simulation.

What additions could you add to the simulation?

asteroids

lost aliens

Slalom, maze,
obstacle course

docking speed
restrictions

lives, health,
energy levels

time challenge

