

Avoid the Asteroids



Ruth Patrick Science
Education Center

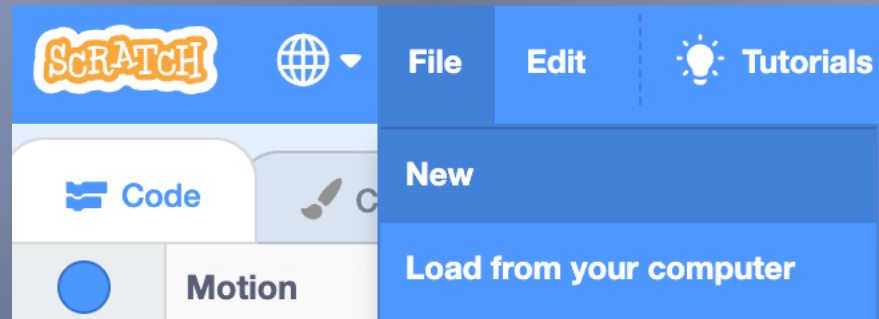
Infusing a love for Science, Technology, Engineering and Math



Create a project where a player must
avoid asteroids

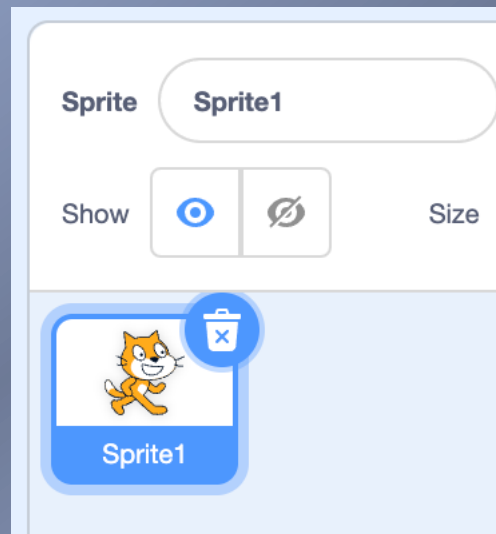
Getting Started

- Open Scratch
- Click on **File** at the top left of the screen
- Choose **New** from the drop-down menu



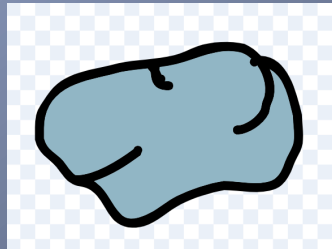
Remove Scratch Cat Sprite

- We will not use Scratch the Cat, so click the **Garbage Can** with the X.



Add Sprites

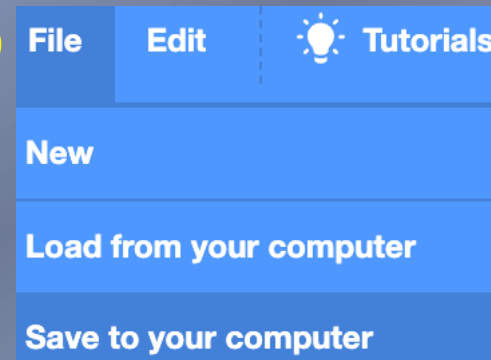
- Add sprites for
 - Rocketship
 - Rocks – The rocks are not the best for our purposes. You could try to make your own.



Save Your Project

- Save Avoid the Asteroids

- Chose **File** then **Save to your computer**.



- Change the name (starting with your last name) to
 - *Patrick* Avoid the Asteroids.sb3
- Click **Save**.

Change Backdrop to Red

- Click on the **Paint** option in the **Backdrop** tab
- Click Convert to Bitmap
- Use the fill to to paint the backdrop red

Add Stars Backdrop

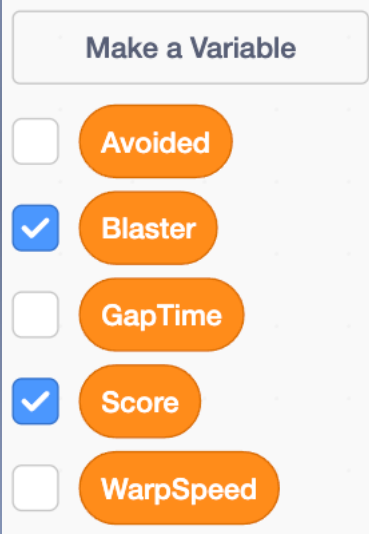
- Click on the **Stage** section on the right side of the window
- Click Choose a Backdrop
- Key “star” in the search field
- Choose **Stars**

Set Default Backdrop

- Click on the **Backdrop** tab
- Verify that Stars is selected
- The selected background will be the default.

Create Variables

- Click the Code tab
- Add the variables
- Be sure that only these are “checked”
 - Blaster
 - Score



The screenshot shows a dialog box titled "Make a Variable" with a list of five variables, each with a checkbox and a blue checkmark icon. The variables are: Avoided (unchecked), Blaster (checked), GapTime (unchecked), Score (checked), and WarpSpeed (unchecked).

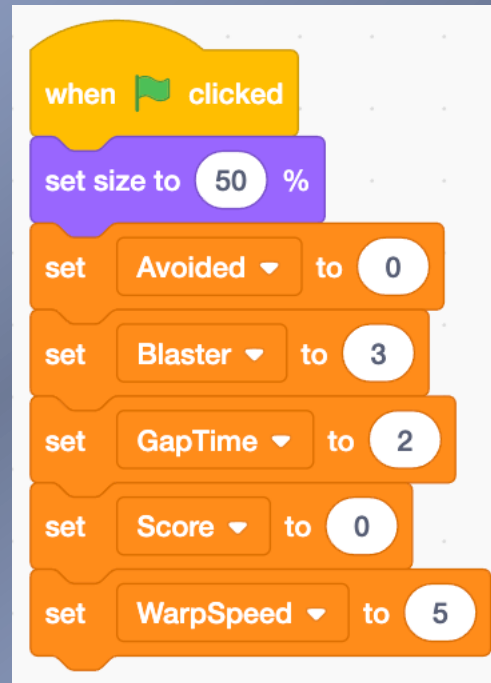
Variable	Checked
Avoided	No
Blaster	Yes
GapTime	No
Score	Yes
WarpSpeed	No

Variable meanings

- Avoided: counts how many asteroids were dodged
- Blaster: How many shots left in laser blaster
- GapTime: The gap in seconds between new asteroids appearing. Gets smaller as the game goes on
- Score: The score
- WarpSpeed: Speed of rocket

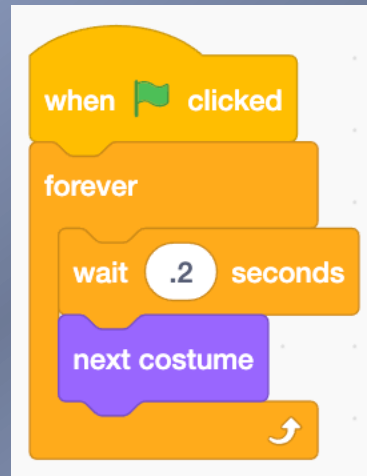
Set up the Variables

- Add these code blocks to the Rocketship sprite



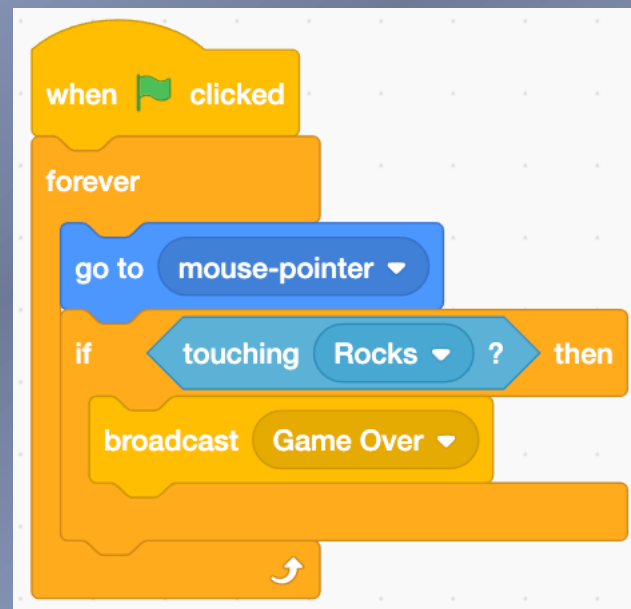
Rocket Animation

- Add these code blocks to the Rocketship sprite



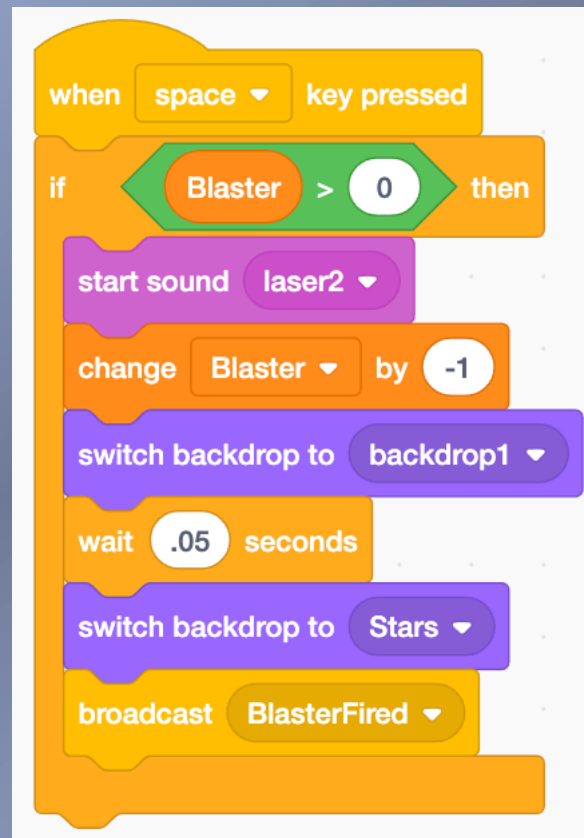
Steer the Rocket – End Game

- Also add these code blocks to the Rocketship sprite
- Create the broadcast message using the drop-down menu



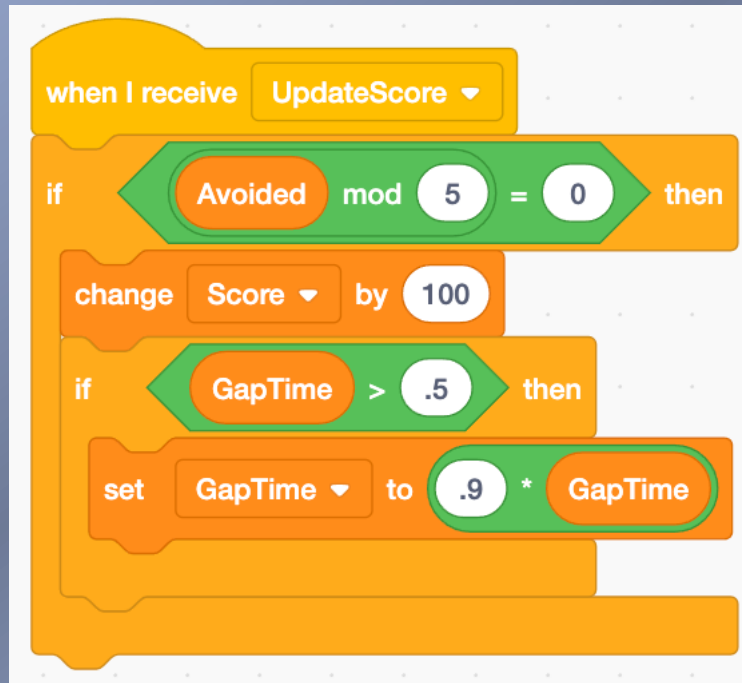
Fire the Laser

- Add these code blocks to the Rocketship sprite to fire the laser



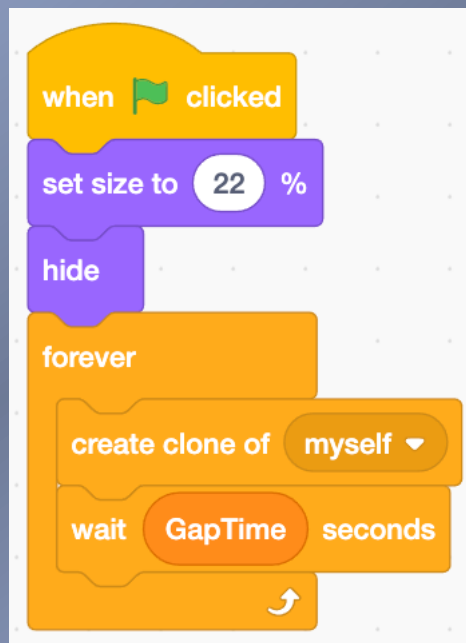
Update the Score

- Add these code blocks to the Rocketship sprite to change the score and GapTime



Coding Rocks

- Add these code blocks to the Rocks sprite



Flying Rocks

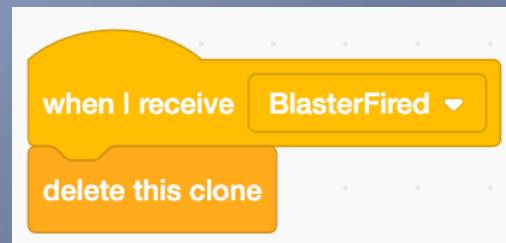
- Add these code blocks to the Rocks sprite

The image shows a Scratch script for a rock sprite. The script starts with a 'when I start as a clone' event block. This is followed by a 'set size to' block with a 'pick random' block set to 20 to 50 percent. A 'forever' loop contains a 'show' block, a 'go to x:' block with a 'pick random' block set to -240 to 240 and a 'y:' block set to 200. Another 'forever' loop follows, containing a 'turn' block set to 15 degrees, a 'change y by' block with a '-1' multiplier and a 'WarpSpeed' variable. An 'if' block checks if the 'y position' is less than -170. If true, it contains a 'change' block for 'Avoided' by 1, a 'broadcast' block for 'UpdateScore', and a 'delete this clone' block. The script ends with two return arrows.

```
when I start as a clone
  set size to pick random 20 to 50 %
  forever
    show
    go to x: pick random -240 to 240 y: 200
    forever
      turn 15 degrees
      change y by -1 * WarpSpeed
      if y position < -170 then
        change Avoided by 1
        broadcast UpdateScore
        delete this clone
    
```

Blast All Asteroids

- Add these code blocks to the Rocks sprite



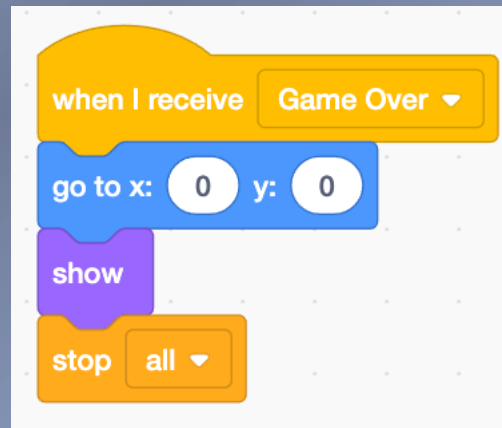
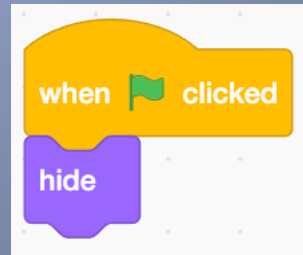
Special Effects Sprite

- Choose Paint from the Choose a Sprite menu near the bottom right.
- Name the sprite “Whoops”
- Paint a “Whoops” Explosion



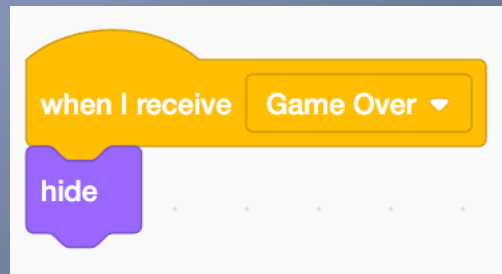
Special Effects Code

- Add these code blocks to Whoops Sprite



Game Over – Hide Rocket

- Hide the rocketship when the game is over.



Well done!

- Save your project
 - Chose **File** then **Save to your computer**.
 - Click on the name that you saved earlier
 - Click **Save** then click **Replace**.

