

Scratch Project—Alien Attack

Your town is under attack by a group of aliens and you are the only person that can save us. Your character is going to blast these aliens away.

In this game, you must fire upon the attack aliens while dodging their invasion. To play the game, move your character with the arrow keys and press the spacebar to fire. You lose one of your three lives each time an alien hits you.

In this game, you will:

- Add special effects to make sprites materialize and evaporate
- Enable one sprite to fire upon another
- Use broadcasts to swap information between sprites
- Add looping background music to your game
- Display the score of each game
- Create variables that will keep track of the player's score and lives lost
- Give the player three lives

Extra credit will be given if you can:

Clone an alien sprite so that they duplicate either upon a specific score or after a specific amount of time.

Add a script to your stage so that each time the green flag is clicked, the stage changes color to a random number between 1 and 200.

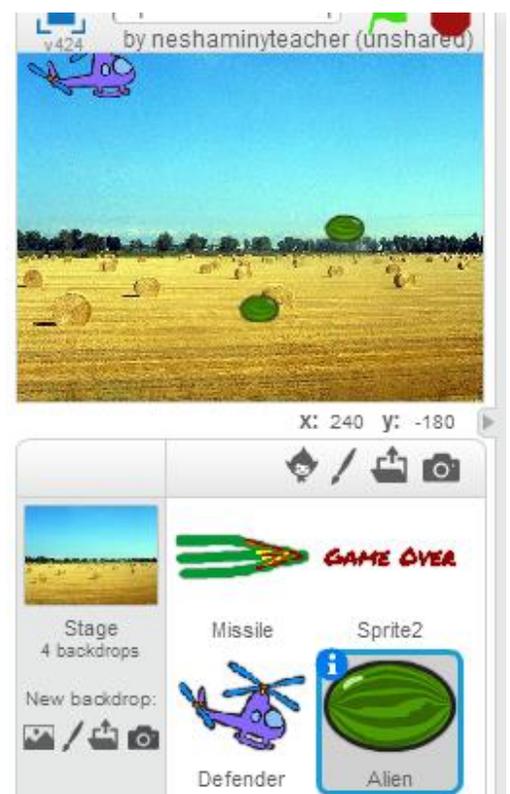
Background Selection:

Select a stage that is appropriate to the game. A simple background is best. Backgrounds that are too busy will make the sprites difficult to view.

Sprites:

Begin by deleting the Scratch Cat sprite, as it is not going to be used in this game. Add 4 sprites:

1. Your character (I used a helicopter). This should be facing to the right as that is the way that it will be shooting. Rename this sprite "Defender."
2. The attack alien (I used watermelons). This should be facing towards your character, or to the left. Rename this sprite "Alien."
3. The missile that will be shooting the aliens. This sprite should be designed as if firing to the right, or towards the alien. Rename this sprite "Missile."
4. A Game Over message will be another sprite. This sprite will be text and will say "Game Over".



Costumes:

You need to add a second costume to the alien sprite to show what it will look like when it is hit by the missile. Since your alien will be quickly zapped away, this costume will only display briefly. Click on your alien sprite and go the Costumes Tab. Duplicate the first costume of your alien by right clicking on it and then going to duplicate. Change the look of the new costume you just created so that it looks as if it was struck by the missile. This can be as simple as a color change or as involved as an alien broken into pieces.

*You **MUST** change the names of your Alien costumes so that you can control which costume you want to display in your programs.*

Name the first costume: Costume1.

Name the second costume: Costume2.

Sounds:

A game is so much better with sounds. You will be adding the following sounds to the sprites listed below. In this step, you are only adding the sounds to the sprites—we will be using them later in your scripts.

1. You need to add a sound that will play throughout the game as background music. Add this sound to your **Defender sprite**. When you go to sounds, be sure to select a sound from the Music Loops category.
2. Your **Defender sprite** also needs a sound that will be played when your sprite is hit by the aliens (such as scream-male1 or scream-female).
3. Add a sound to your **Alien sprite**. For this one, I want you to use the spiral sound that is in the Electronic sound effects category.
4. Add a sound to your **Missile sprite**. For this one, use the laser1 sound from the Electronic sound effects category.
5. The **Game Over sprite** needs three sounds: trumpet1, trumpet2 and triumph.

Variables:

Variables are simply a storage location for data that will be used throughout a program. Variables are very important in programming because they allow you to write flexible programs. Instead of writing a separate script for each value, you are able to write a script that allows the program to run as data changes.

For this game, you will need to create two variables. When creating these variables, go to the Data blocks and make sure you click on the box to create it for all sprites:

1. Score. This variable will keep track of the player's score.
2. Player Hit. This variable will be used to remember whether the player has been hit or not. We need this variable so that we know when to end the game.

Programming the Defender Sprite

Script 1:

Click on the defender sprite and add the following blocks to set the score to zero and hide the score from being displayed while you play the game:

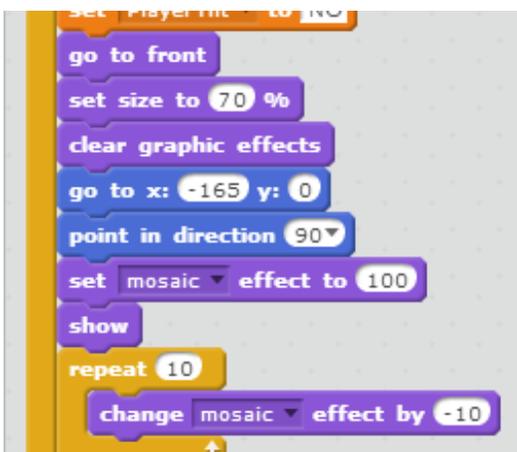


Add the following blocks to reset the variable “player hit” to NO at the beginning of the game. This will repeat 3 times; after the defender is hit 3 times, the game will end.



The next blocks go within the Repeat 3 loop. Add blocks to make sure the Defender appears on top of all other sprites, clear any graphic effects, point to the right (90 degrees) and position the Defender in its starting location of X: -165, y: 0. You will also add a block to set the size of the Defender sprite.

Depending on what graphic you are using for the Defender, this number will need to be adjusted until the size seems appropriate to you. Last, we are putting in a mosaic effect so that your Defender will seem to materialize as if it's arrived in pieces that are then put together.



Finally, we need to make a script that will control the Defender's movements and will repeat until the player is hit. Add these blocks directly under the Repeat 10 loop.



When the Repeat Until loop ends, the player has died. When you lose a life, the Defender will scream (or make whatever sound you chose for when the defender dies), spin around and fade away. These blocks go directly under the Repeat Until loop.



The next life will begin after your Defender and Alien disappear. Your Defender sprite will send a message to the Alien sprite to cloak (hide) itself. This is called broadcasting. You will create a new message for this broadcast naming it "Cloak Alien". These blocks go directly under the Repeat 10 loop.

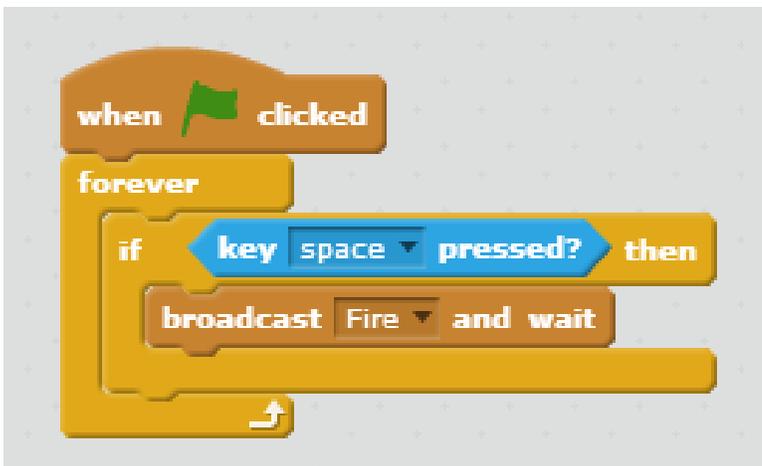


When the Repeat 3 loop ends, the player has died three times and the game is over. A "game over" broadcast will be sent out to all sprites to end the game. Again, you will create a new broadcast message, naming it "Game Over".



Script 2:

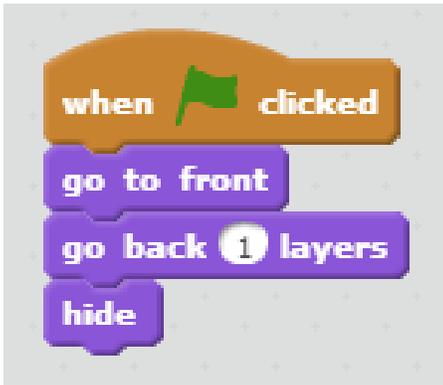
Create a separate script for the defender sprite that will tell the missile to fire when the space key is pressed. This time, your broadcast message will be "Fire".



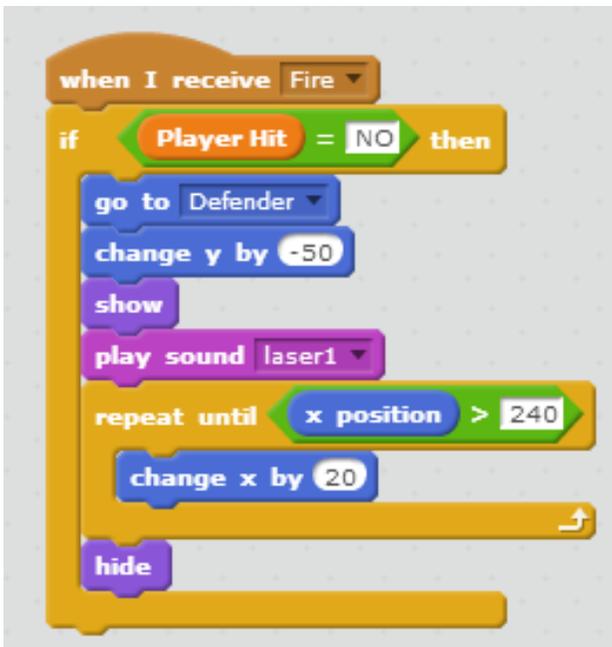
Programming the Missile Sprite

Script 1:

Click on the missile sprite and add a script to hide the missile when the game starts and position it behind the Defender.



Add a separate script for when the broadcast “fire” is received. Use an If loop for this so that it will only work if the player is not hit (we don’t want to fire when the player has already been hit). This script will position the missile so that it is fired from the correct area of the Defender (this is the Y axis). You will have to adjust this number depending upon where you want your Defender to fire from. For the sound, select the sound that you previously selected for when the missile is fired. A Repeat Until loop is needed so that the missile moves until it moves off the right side of the screen.



Programming the Alien Sprite

Script 1:

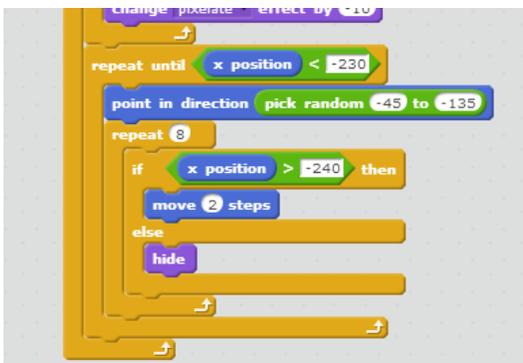
Click on the Alien sprite and add a script to set the rotation of it to left-right only since it will only glide from left to right. Set the size of this sprite to what you feel is appropriate. Keep adjusting the size until you are happy with the result. The smaller the alien, the harder it will be to fire at them.



Under the rotation block, add a Forever loop that continually repositions the Alien in a random Y axis position and makes it pixelate when it appears.



Next, the Alien needs to be programmed to move. You can adjust the number of steps to change the speed of the Alien. The higher the number of steps, the faster it will move and the game will be more difficult.



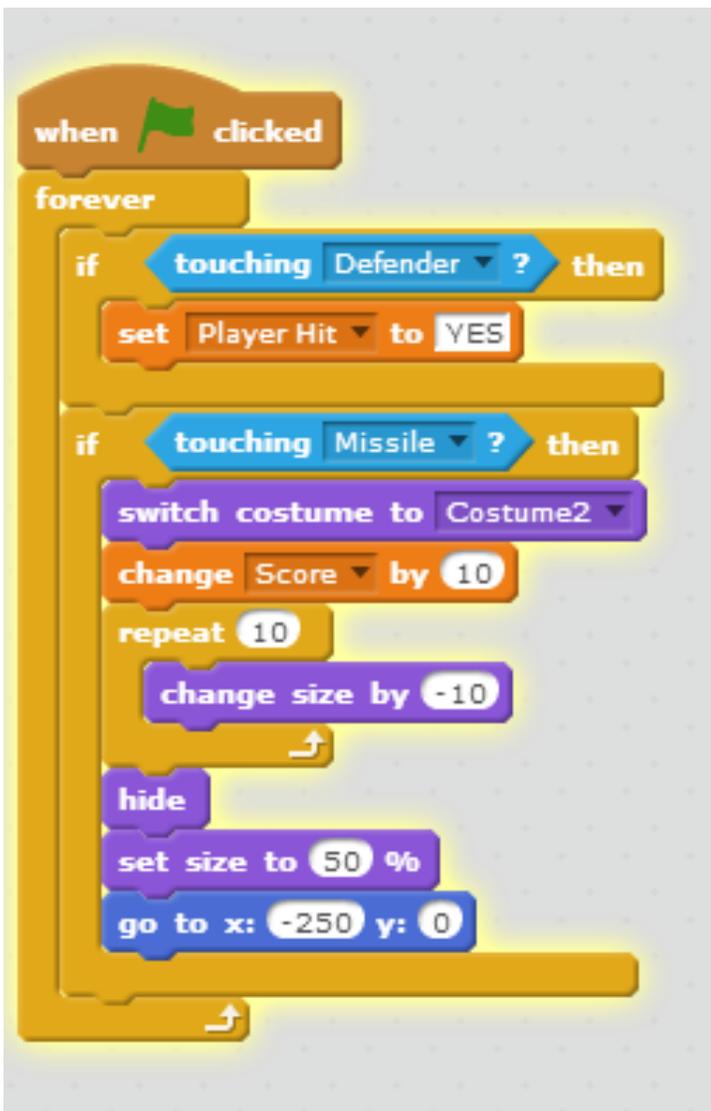
Script 2:

Add a separate script that will hide the sprite while the defender is materializing.



Script 3:

The last script for the Alien program will control what it will do when it either hits the defender or the missile. When the Alien has been shot by the missile, the costume changes to Costume2 and the score increases by 10.



Adding a Second Alien Sprite

To make the game harder, add a second Alien sprite. To do this, right click on the Alien sprite and select Duplicate.

Programming the Game Over Sprite

Script 1:

Click on the Game Over sprite and add a script that will hide the Game Over Message when the game begins:



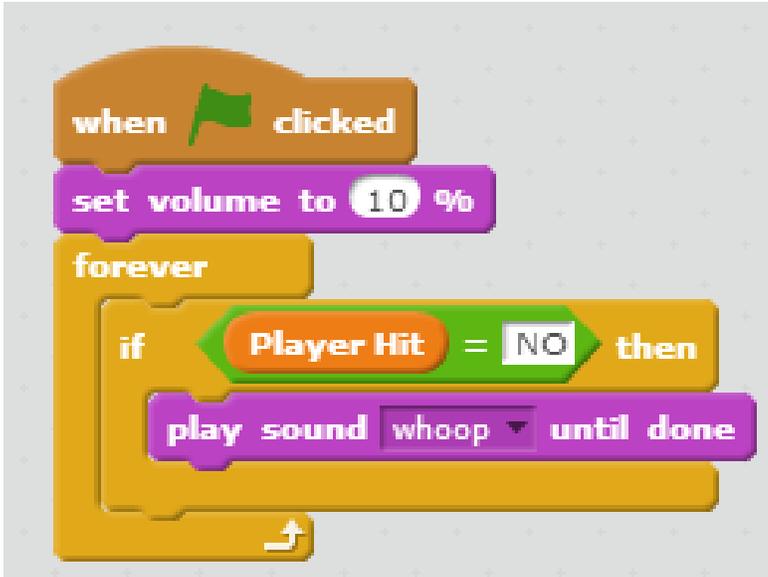
Script 2:

Add one more script to the Game Over sprite that will control what you want to happen when the game is over. The Stop All block is very important, as it tells every sprite in the game to stop when the game is over.



Programming Background Music

Click on the Defender sprite and add the following script to play music throughout the game. Select the sound that you previously selected from the Music Loop section of the Sounds tab.



Extra Credit:

Option 1: 5 bonus points

Add a script to your stage so that each time the green flag is clicked, the stage changes color to a random number between 1 and 200.

Option 2: 15 bonus points

Clone an alien sprite so that they duplicate either upon a specific score or after a specific amount of time.