

Intro to Programming

Scratch #12h – Alien Invasion

Objective: Use the techniques you've learned in Scratch to create a shooter game. You will shoot upwards at alien invaders.

1. Login to the Scratch website. Create a new project. Change the name of this project to *first_last_scratch_12*. Click *File->Save now*
2. Your game will have a rocket ship that moves left and right across the bottom of the screen and shoots upwards at alien ships that move from the right side of the screen to the left side of the screen at different intervals.

You need 4 different costumes for an alien ship and 4 different speeds. You can decide the speeds and the costumes. You can change the colors of an existing costume or have completely different costumes.

3. Create the necessary sprites:
 - a. Create a sprite of a **rocket ship**. You can use the one that comes with Scratch, or find one on the Internet. It needs to point towards the top of the screen. (See a sample below.)
 - b. Create a sprite of an **alien ship**. You'll probably find this one on the Internet. (See sample below.) It should have 6 costumes. You can change the colors of an existing costume, or you can have different images for each costume. 4 of the costumes will be of an alien ship; the 5th and 6th costumes will look like an explosion roughly the same size as your alien ship.
 - c. Create a sprite of a **bullet**. You already know how to do this. The bullet should point up, not sideways.
4. Create the necessary variables:
 - a. Create a variable called *Score* for **all** sprites. This variable should appear on the Stage. It must be in large readout mode. There must be text that describes what it is. This variable must hide when the game is over, and show when the game starts.
 - b. Create a variable called *clone percent* for the **alien ship** only (not all sprites). This variable should **not** appear on the stage.
 - c. Create a variable called *speed* for the **alien ship** only (not all sprites). This variable should **not** appear on the Stage.
5. Create 2 backdrops for the Stage:
 - a. one that displays when the game is playing
 - b. one that displays when the game is over.
6. Create 2 scripts for the **Stage**:
 - a. When green flag clicked, display the backdrop for playing, then **play music** in a forever loop.
 - b. When I receive *game over*, display the game over backdrop.
7. Create 2 scripts for the **rocket ship**:
 - a. When green flag clicked:
set Score to 0, go to front layer, and show.

Now, inside a forever block, use 2 if-then blocks so that if the left arrow key is pressed, the rocket moves to the left (change x by -10), and if the right arrow key is pressed, the rocket moves to the right (change x by 10).

- b. When I receive game over:
stop *other scripts in sprite* and then hide.
8. Create 3 scripts for the **alien ship**:
- a. When green flag clicked:
hide
then in a forever block,
set *clone percentage* to a random number from 1 to 100. Set the value of the *speed* variable and switch the costume based on the value of *clone percentage*. The *speed* values will be negative so that the alien ship moves to the left. You can choose the speeds. Your different alien ships should clone 34%, 26%, 22%, and 18% of the time.
create a clone of myself, and then wait *pick random 0.25 to 1.25* secs. This will cause the ships to come out at different intervals.
 - b. When I start as a clone,
go to the top of the screen off the right side (go to x: 275, y:155) then show
Then, inside a forever block, change x by *speed* followed by 3 if-then blocks.
 - i. The first if-then block will add 1 to the score, switch to one of the explosion costumes, play an explosion sound until done and then delete the clone if it is *touching bullet*.
 - ii. The second if-then block will subtract 2 from the score and delete the clone if its *x position* < -238 or whatever value of *x position* you need for it to be off the screen on the left.
 - iii. The third if-then block will check if *Score* < 0 and if so, broadcast *game over*.
 - c. When I receive game over,
stop *other scripts in sprite* and delete this clone.
9. Create 3 scripts for the **bullet**.
- a. When green flag clicked
hide
Then, inside a forever-block there is one if-then block. If key space pressed then create clone of myself and wait 0.4 secs.
 - b. When I start as a clone,
go to the rocket ship, go back 5 layers, show.
Then inside a forever-block, change y by 10 followed by 2 if-then blocks. If touching alien ship then, wait .05 secs, delete this clone. If y position > 180 then delete this clone.
 - c. When I receive game over
stop *other scripts in sprite* and delete this clone.

10. Play your game. The aliens should come out at different intervals on the right side of the screen and move to the left. The alien ships should have different looks and move at different speeds. Use the left and right arrow keys to move the rocket ship. Press the space bar to shoot bullets. If an alien ship is hit, its costume should change to a random explosion, you should hear a sound, the ship should disappear, and you should get a point. If the ship makes it to the left edge, it should disappear and you should lose 2 points. If your score gets below 0, the game is over.
11. Always do *File->Save now* before you log out of the Scratch website.
12. Now do *File->Save to your computer*.
13. Turn in your *first_last_scratch_12.sb3* file to *missblomeyer.com* in the usual way.

