

# Space Invaders

The invasion is coming!!!!

Play the game we are building:  
[Click](#)

# Today's Game

**Challenge:** Reproduce the famous Space Invaders arcade games

**Goal:** Add your own creativity into a game that you know.

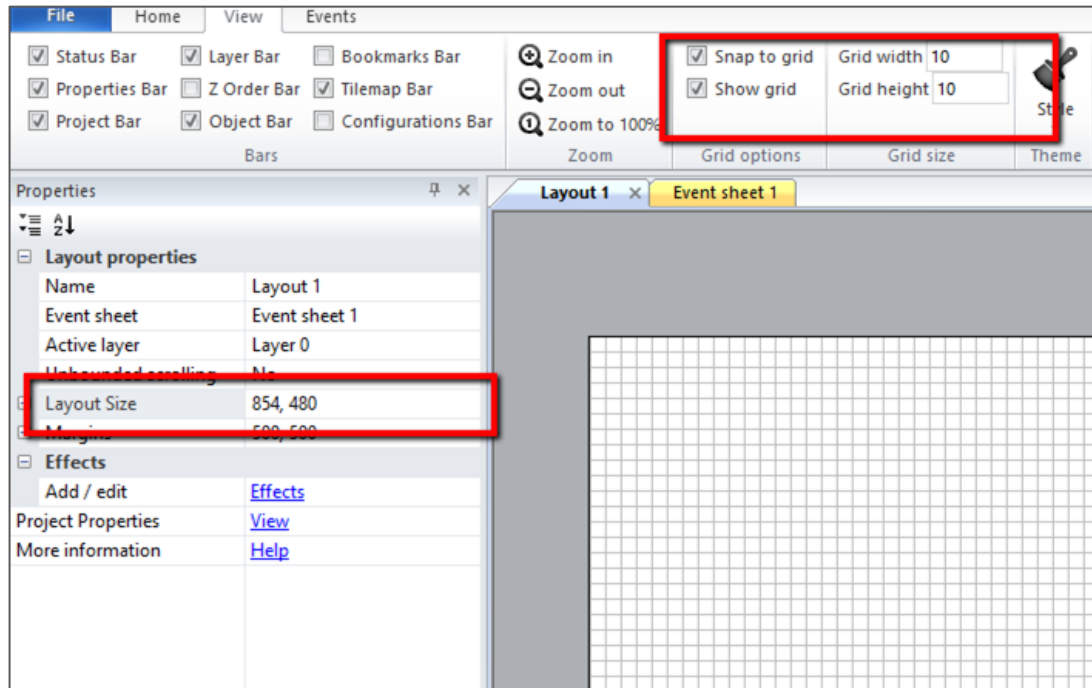
## Features:

- Invaders move back and forth across the screen
- A UFO comes out for extra live
- Use 8-bit characters, fonts, and game-play

# Setup Layout

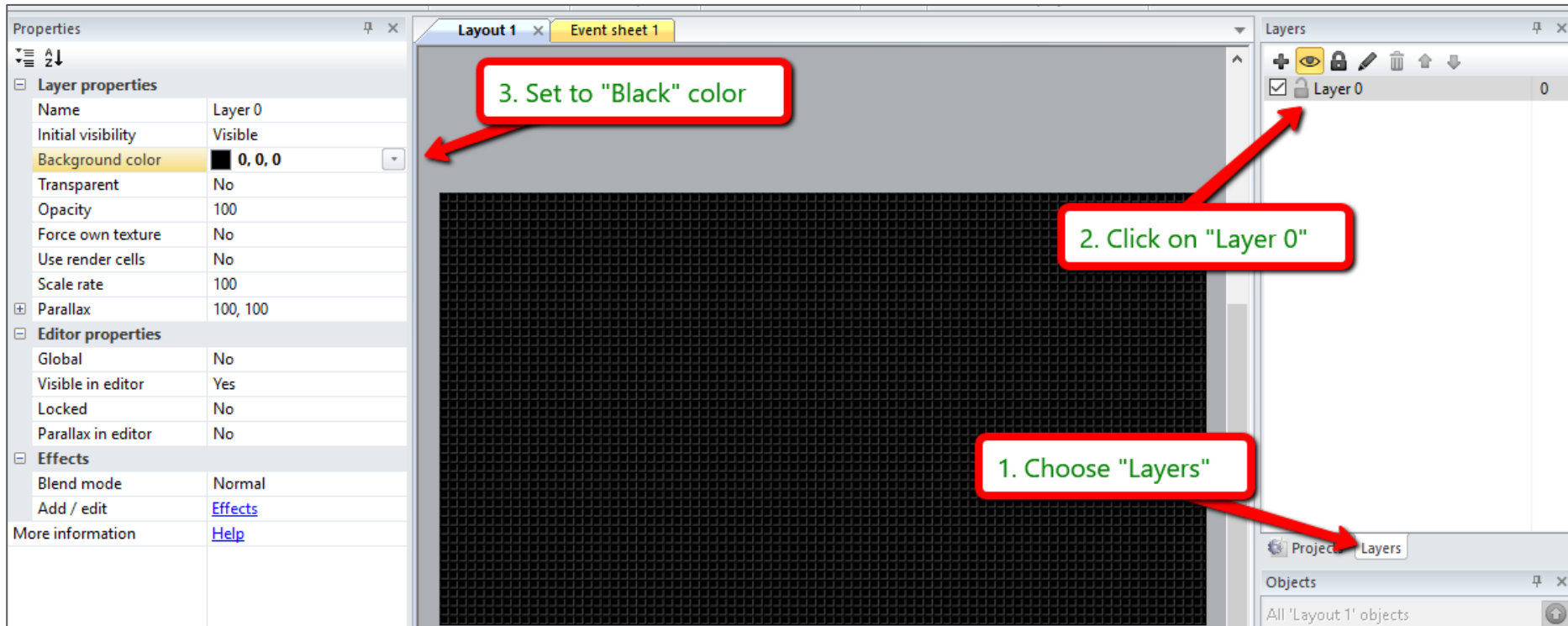
- Layout size (854, 480)
- Enable “snap to grid”
- Enable “show grid”
- Set grid to 10 & 10

*(NOTE: You must click back to another grid width to get it to set. It is a bug in Construct 2)*



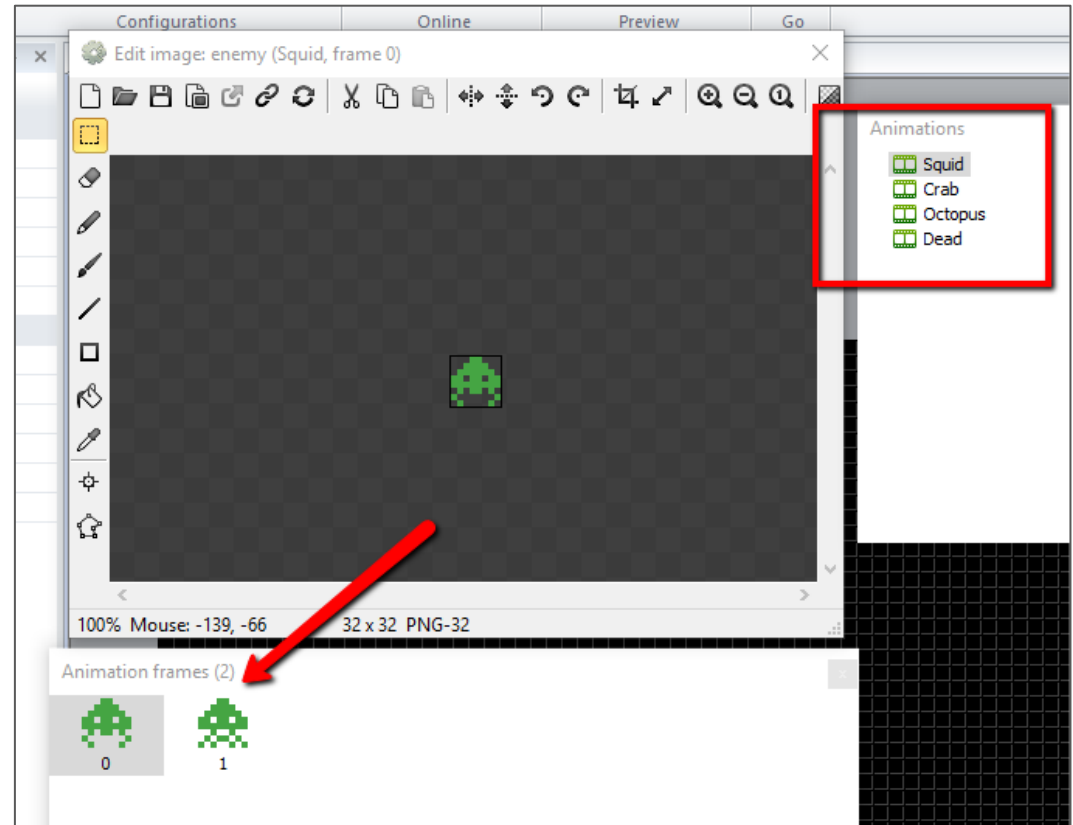
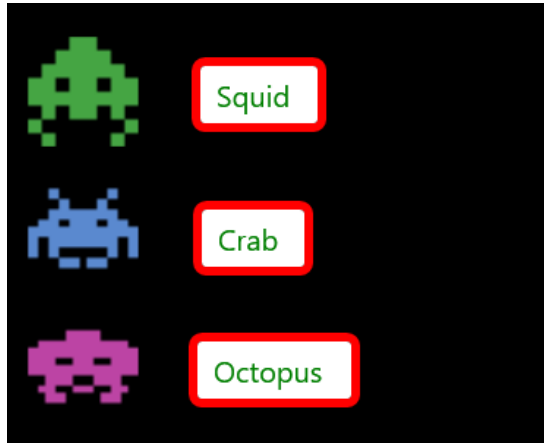
# Set the Layout Background Color

- We are going to use a black background



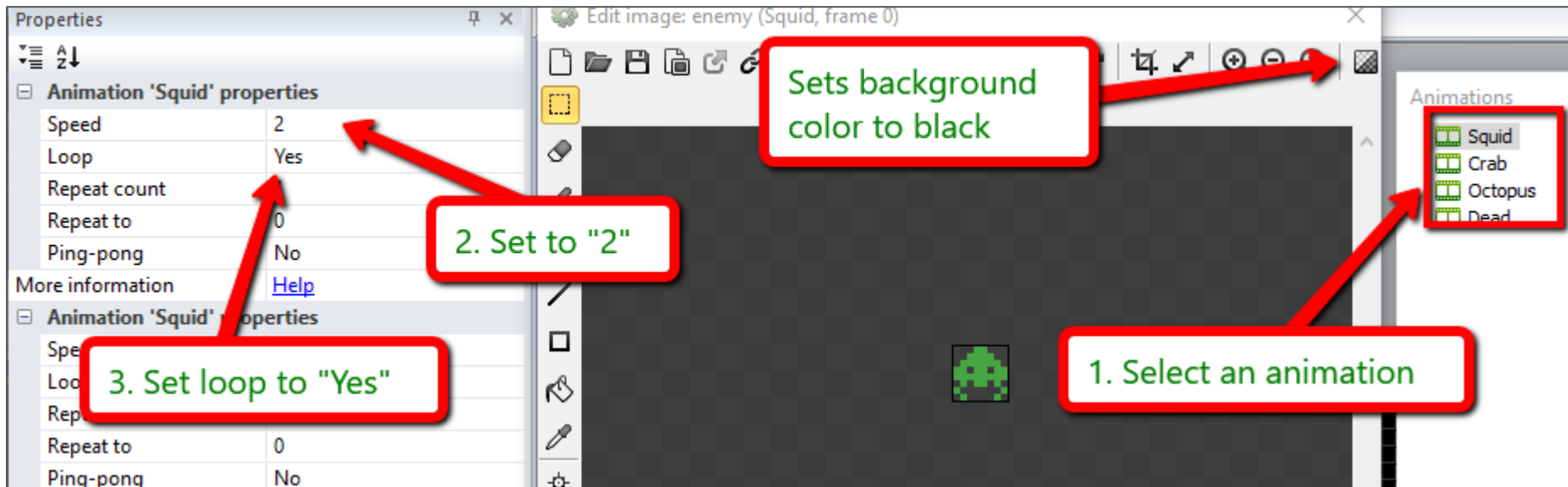
# Create Invaders

- New Sprite
- Create 4 animations:
  - **Crab, Squid,**  
**Octopus, and Dead**
- Each has 2 images (except Dead)



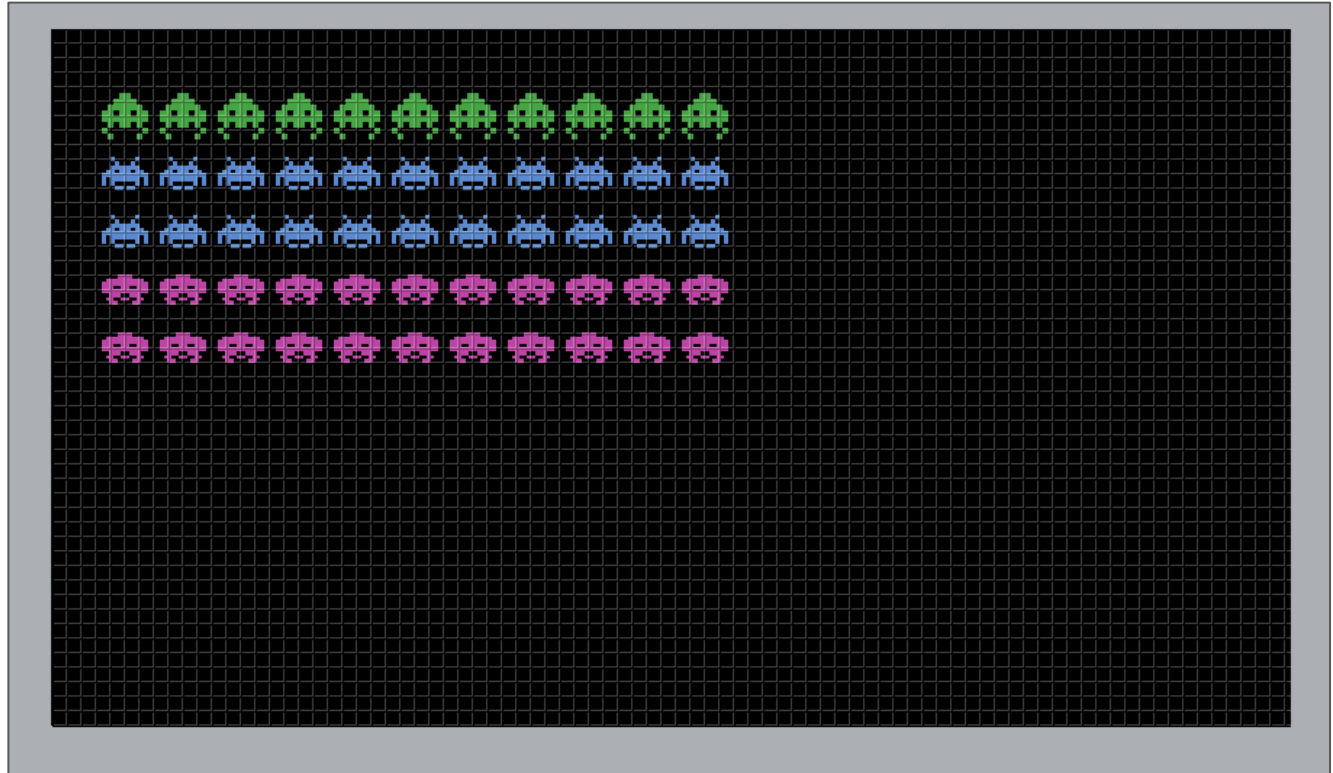
# Adjust Animation Speed

- Set the animation's Speed to "2" and loop to "yes" for each animation
- Also, this button changes the background to black. Helps see the white objects



# Layout Invaders

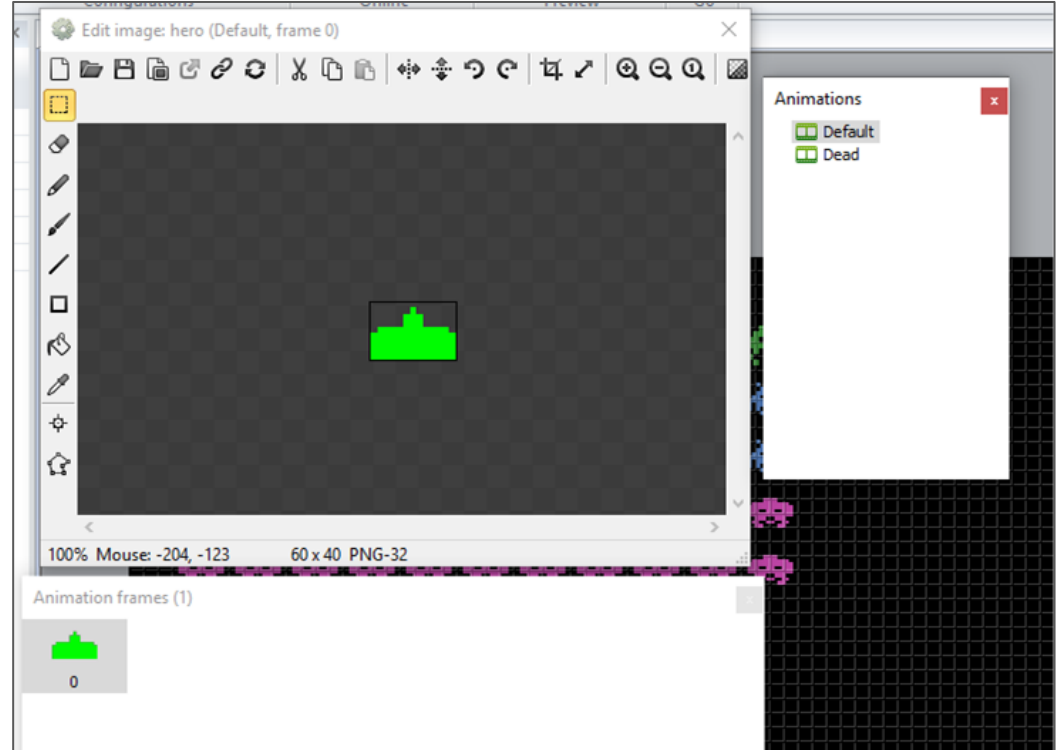
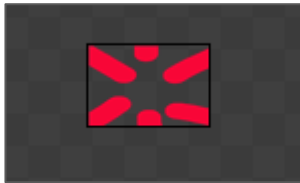
- Name it “**enemy**”





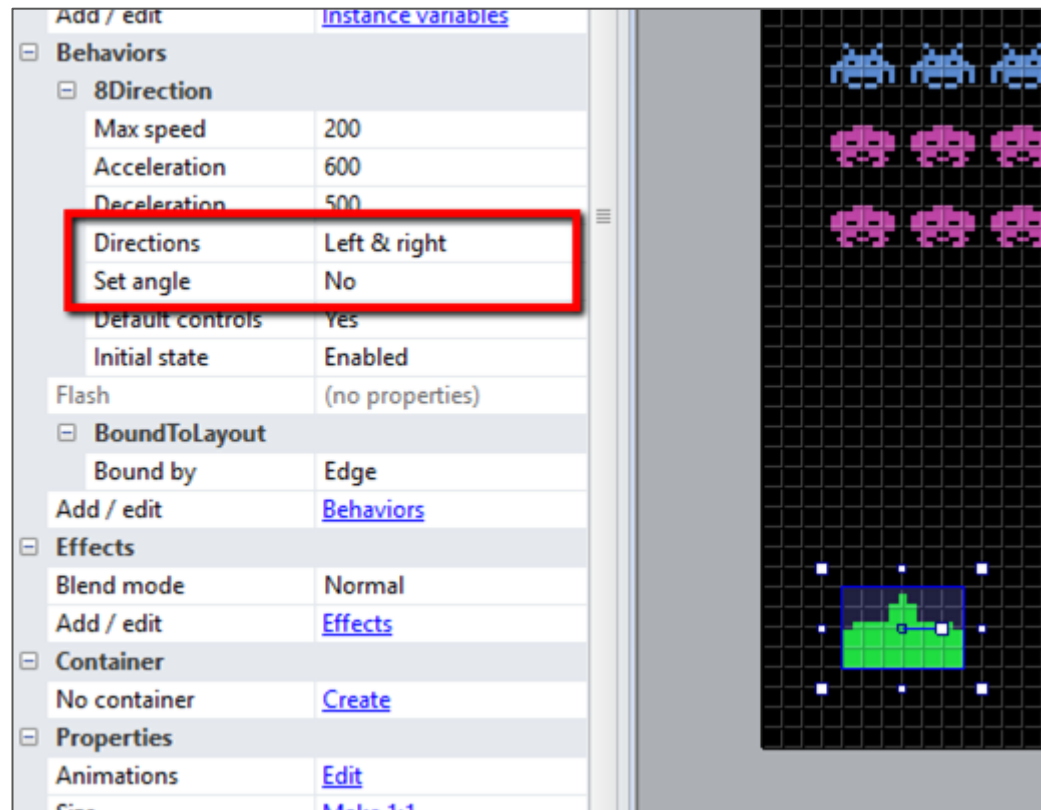
## Create Player

- New Sprite
- Two Animation
  - **Default**
  - **Dead**
- Create your own “**Dead**” image
- Name it “**player**”



# Create Player

- Name “**Player**”
- Behaviors
  - **8-Direction**
  - **Flash**
  - **Bound to Layout**
- Set Properties
  - Direction: **Left & Right**
  - Set angle: **No**



# Create Two Sprites

- Fill them with a “Red”
- Name them:
  - **flipLeft**
  - **flipRight**
- Set Opacity to “40”
- Initial Visibility to “Invisible”



# Define Global Variables

- Setup four global variables, all “**Numbers**”
- “**direction**” will be used to determine which direction the enemies are going



*Global number* **level** = 1



*Global number* **life** = 3



*Global number* **score** = 0



*Global number* **direction** = 20

Add event

# Move Our Enemies

- Event: **System** / “**Every X Seconds**” with the value: **0.5/level**

Parameters for System: Every X seconds

Specify time, in seconds, between running the actions. Interval is limited by the framerate (actions will not run more than once per tick).

Interval (seconds)



[Help on expressions](#)

Parameters for enemy: Set X

New X co-ordinate, in pixels.













x

[Help on expressions](#)

1	 System	Every <b>(0.5/level)</b> seconds	 enemy	Set X to <i>enemy.X + direction</i>
			Add action	

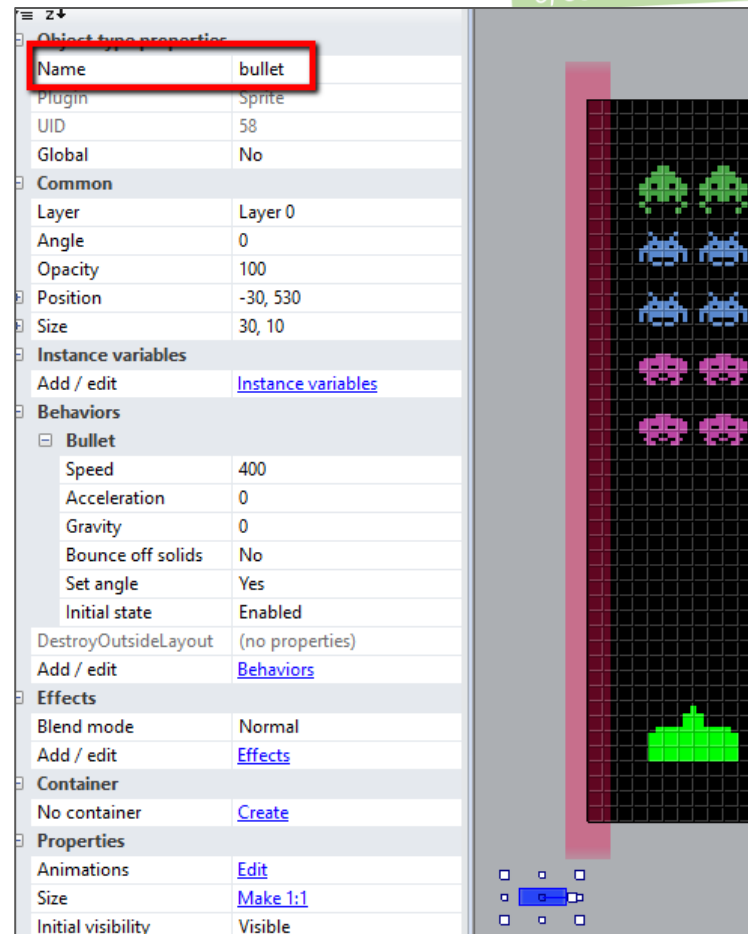
# Turn Enemies Around at Edge

- **Two Events** with **Two Conditions** each.
- First: On collision with **flipRight** - change direction to **-20**
- Second: On collision with **flipLeft** - change direction to **+20**
- **Test Game** - enemies move back & forth while slowing dropping

2	 enemy	On collision with 	 enemy	Set Y to <i>enemy.Y + 1</i>
	 System	Pick all  enemy	 System	Set <b>direction</b> to -20
Add action				
3	 enemy	On collision with  <b>flipleft</b>	 enemy	Set Y to <i>enemy.Y + 1</i>
	 System	Pick all  enemy	 System	Set <b>direction</b> to 20
Add action				

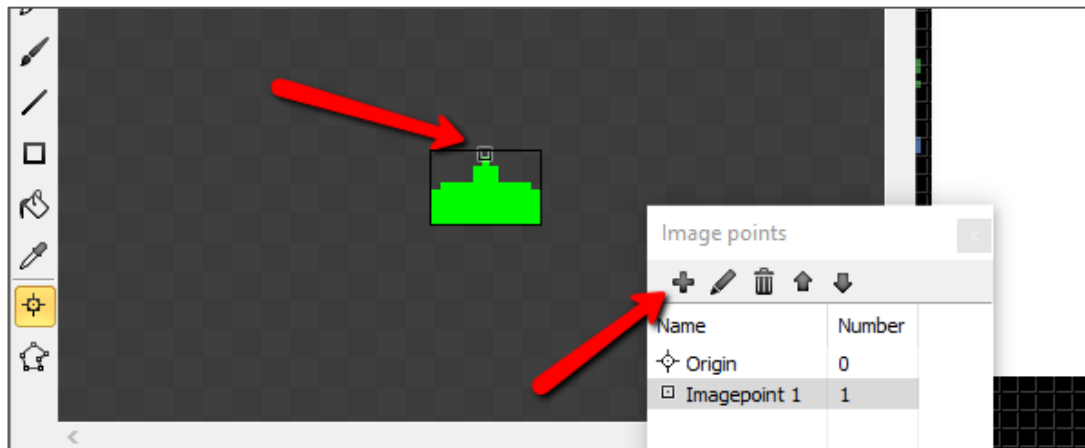
# Add Player's Bullet

- Add a new Sprite
- Fill with a solid color (like Blue)
- Name “bullet”
- Behaviors
  - **Bullet**
  - **Destroy Outside of Layout**
- Place outside of layout
- Make sure it is “**pointing**” right
- **Also** - Add **Keyboard** to layout



# Player Can Shoot!!!

- Add an image point for the bullet.














- Set bullet's “Angle of Motion” to 270 (up)

4	Keyboa...	On <b>Space</b> pressed	player	Spawn bullet on layer 0 (image point 1)
			bullet	Set Bullet angle of motion to 270 degrees
			Add action	





# Kill Enemy & Track Score

- Different points for each type of enemy.

5	 enemy	On collision with  <b>bullet</b>	 bullet	Destroy
			Add action	
6	 enemy	Is animation "Crab" playing	 System	Add 300 to <b>score</b>
			 enemy	Set animation to <b>"Dead"</b> (play from beginning)
			Add action	
7	 enemy	Is animation "Octopus" playing	 System	Add 200 to <b>score</b>
			 enemy	Set animation to <b>"Dead"</b> (play from beginning)
			Add action	
8	 enemy	Is animation "Squid" playing	 System	Add 100 to <b>score</b>
			 enemy	Set animation to <b>"Dead"</b> (play from beginning)
			Add action	

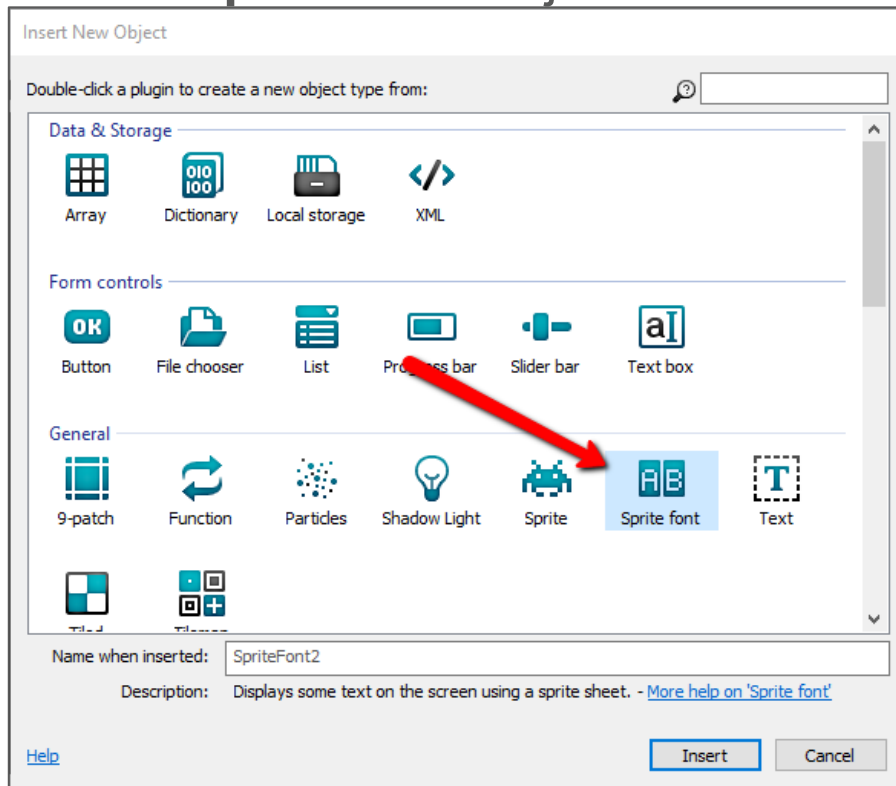
# Kill Enemies

- After the “**Dead**” animation finishes, destroy the enemy

9	 enemy	On animation "Dead" finished	 enemy	Destroy
			Add action	

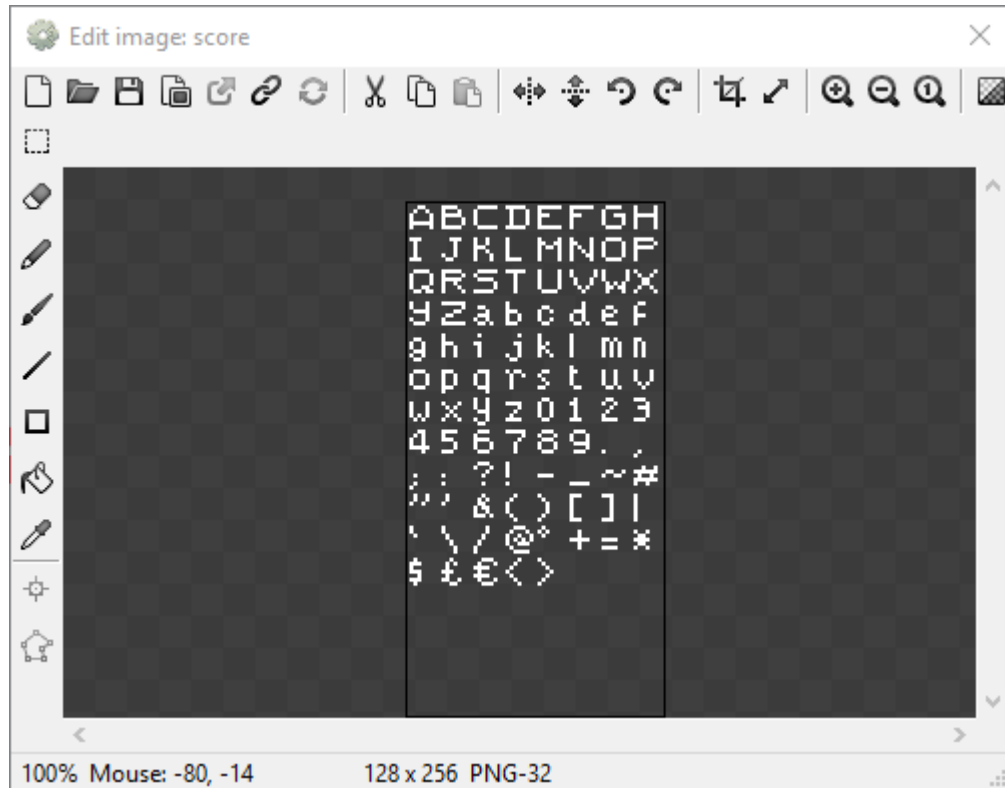
# Create On Screen Display

- We are going to use “**Sprite font**” object



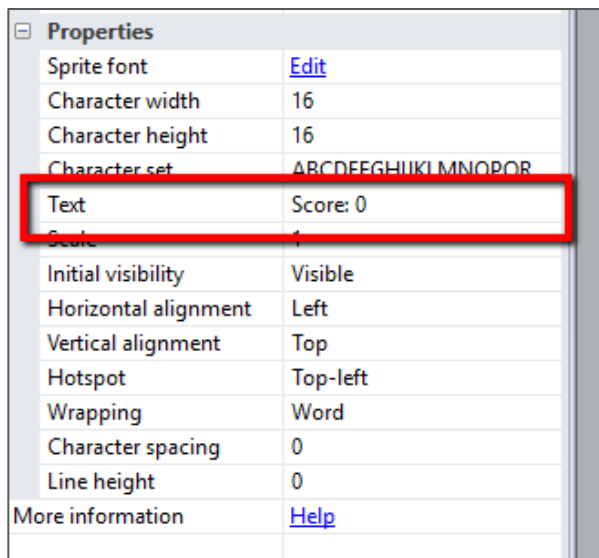
# Create On Screen Display

- After selecting “Insert” and choosing where to go, you will be prompted with an image with black fonts.
- We are going to replace them with an image of white fonts
- Open the provided font image named “**font-white.png**”







# Add Three Sprite Fonts

- Add three “**Sprite Fonts**” each with the white text
- Name them **score**, **level**, and **lives**
- Set text for each.



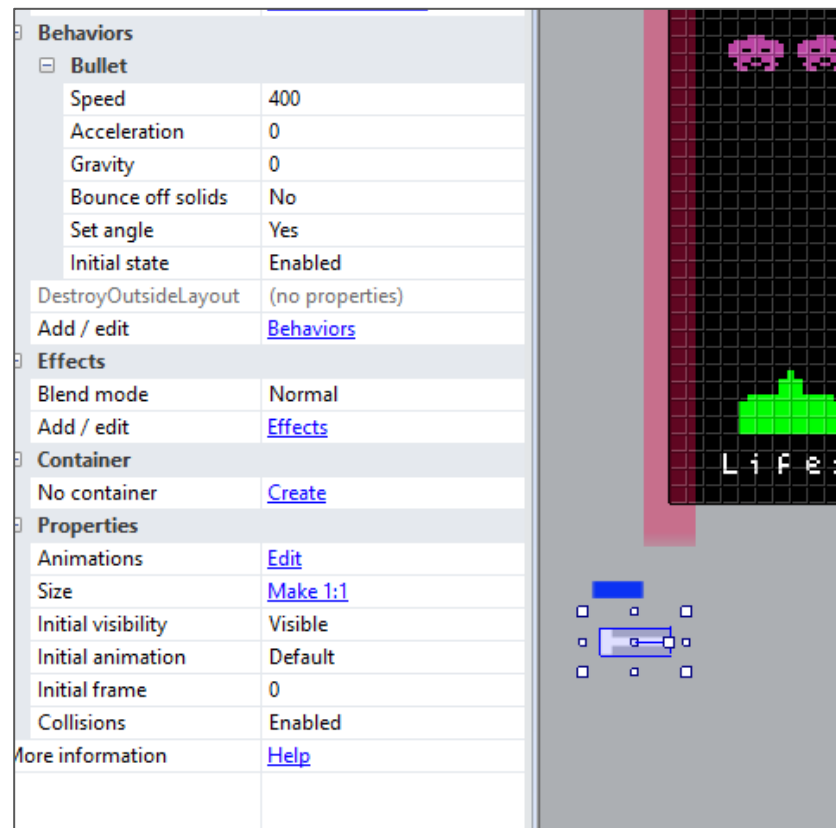
# Update the Display

- Keep the display updated with the global variables

10	 System	Every tick	 score	Set text to "Score: " & <i>score</i>
			 lives	Set text to "Lives: " & <i>life</i>
			 level	Set text to "Level: " & <i>level</i>
			Add action	

# Invaders Shoot Back

- Add a **Sprite** for the invader's bullet
- Name it “**bulletenemy**”
- Behaviors
  - **Bullet**
  - **Destroy Outside of Layout**



# Invaders Shoot Back













- Every (0 to 1) second, ONE of the invaders shoots
- Two **Event** conditions - second one is “Pick a Random”

11	System	Every <b>random(0,1)</b> seconds	enemy	Spawn <b>bulletememy</b> on layer <b>0</b> ( <i>image point 0</i> )
	System	Pick a random <b>enemy</b> instance	bulletememy	Set  Bullet angle of motion to 90 degrees
Add action				



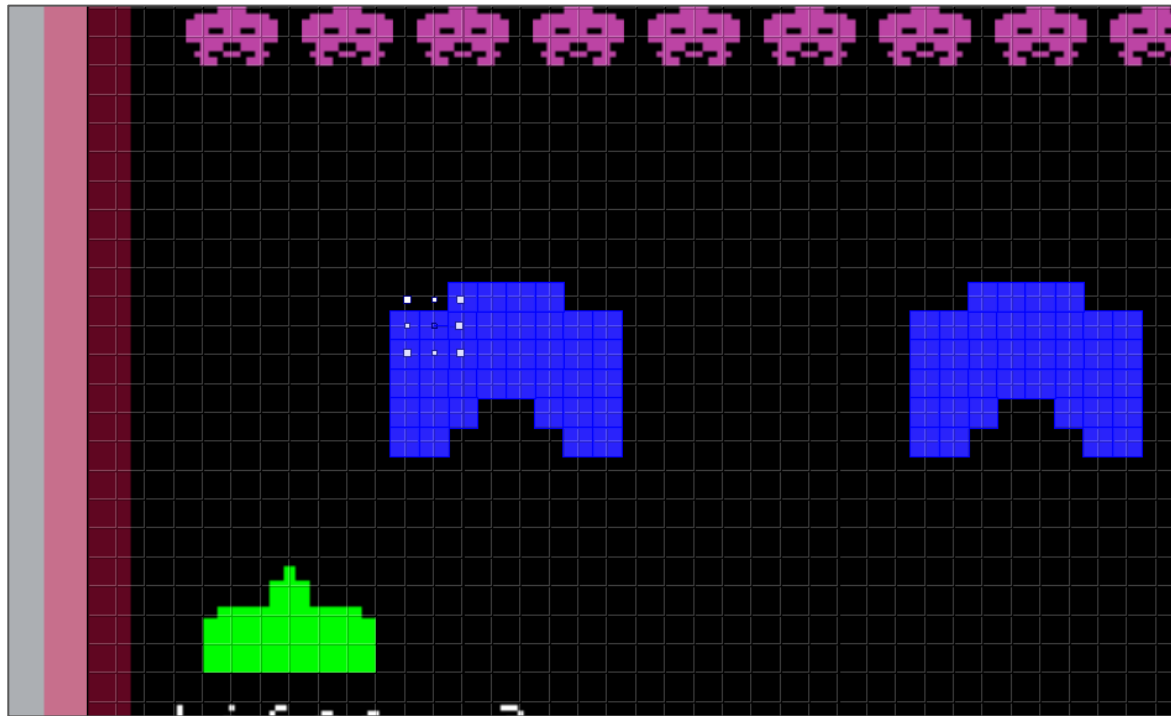
# Invaders Shoot Back

- Bullet hits player, lose a live, flash & change animation
- Once **dead** animation finishes, change player back

12	 bullete...  player	On collision with  <b>player</b>  Is flashing	 System  player  player Add action	Subtract 1 from <b>life</b>  Flash: Flash 0.1 on 0.1 off for <b>1.0</b> seconds Set animation to <b>"Dead"</b> (play from beginning)
13	 player	On animation "Dead" finished	 player  player Add action	Set animation to <b>"Default"</b> (play from beginning)  Flash: Stop flashing



# Add Shields

- Create a **Sprite**, fill with “**Blue**”
- Name it “**shield**”
- And resize it to **10, 10** (*smallest it came be because of our grid*)
- Build a shield with copies of this Sprite
- Make **4** shields



# Destroy The Shield

- If either the enemy or the player's bullet hits the shield, the shield gets destroyed.

14	→  bullete...	On collision with  <b>shield</b>	 bulletenemy	Destroy
			 shield	Destroy
			Add action	
15	→  bullet	On collision with  <b>shield</b>	 bullet	Destroy
			 shield	Destroy
			Add action	

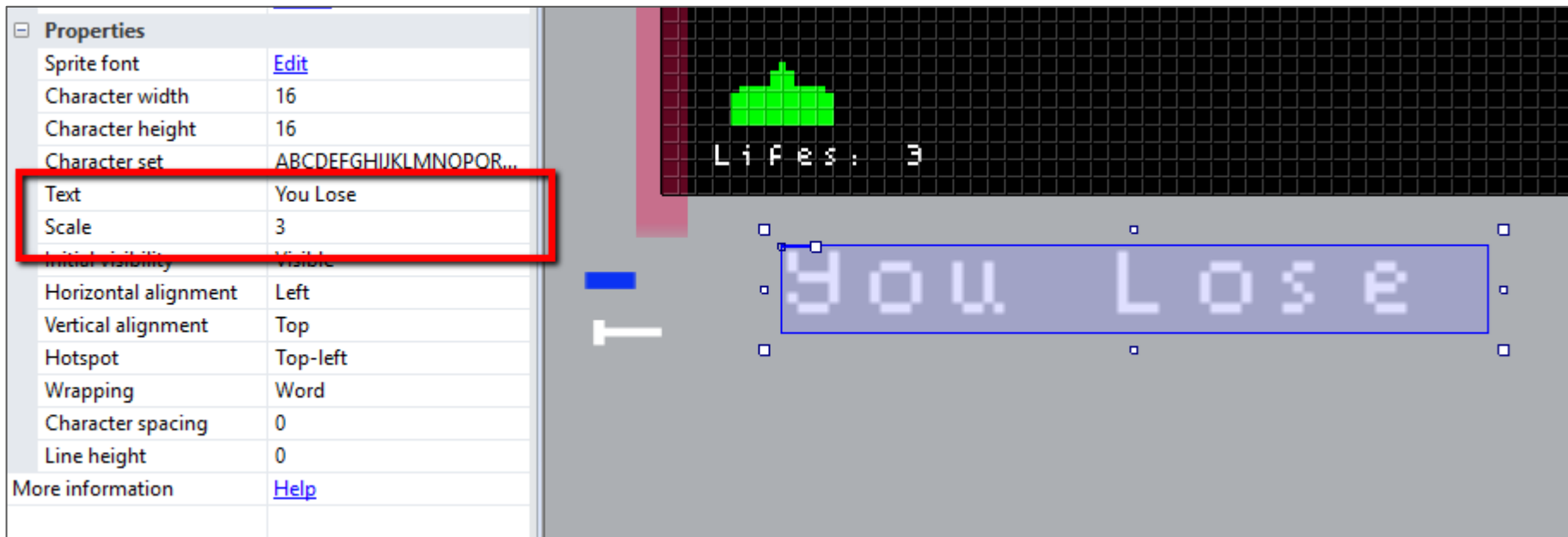
# Bullets Colliding With Bullets

- Let's let our bullets destroy an enemy bullet if they hit

16	  bullet	On collision with  <b>bullet</b> <b>enemy</b>	 bullet	Destroy
			 <b>bullet</b> <b>enemy</b>	Destroy
			Add action	




# You Lose

- Add another **Sprite Font** for a “**you lose**” message
- Set the “**Scale**” to “**3**”
- Place under your layout



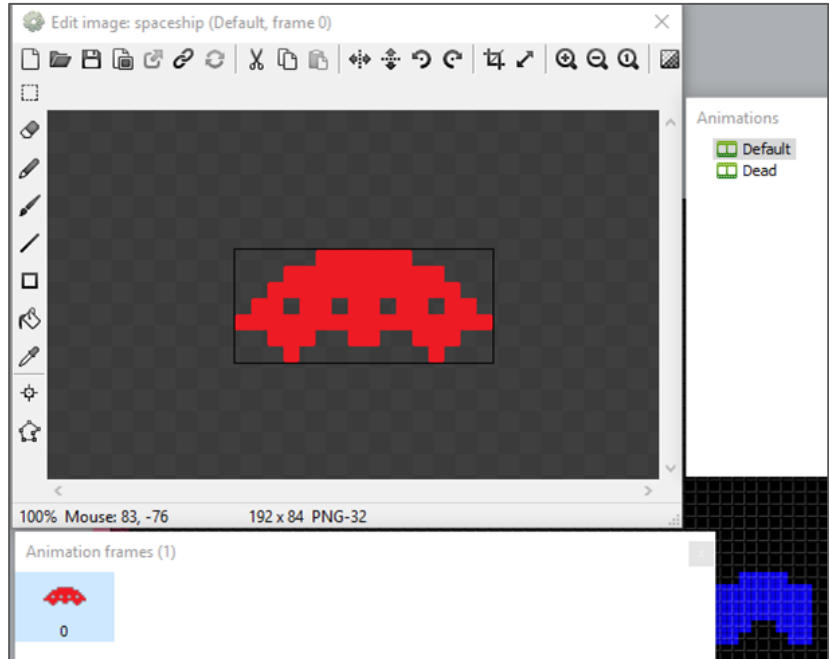
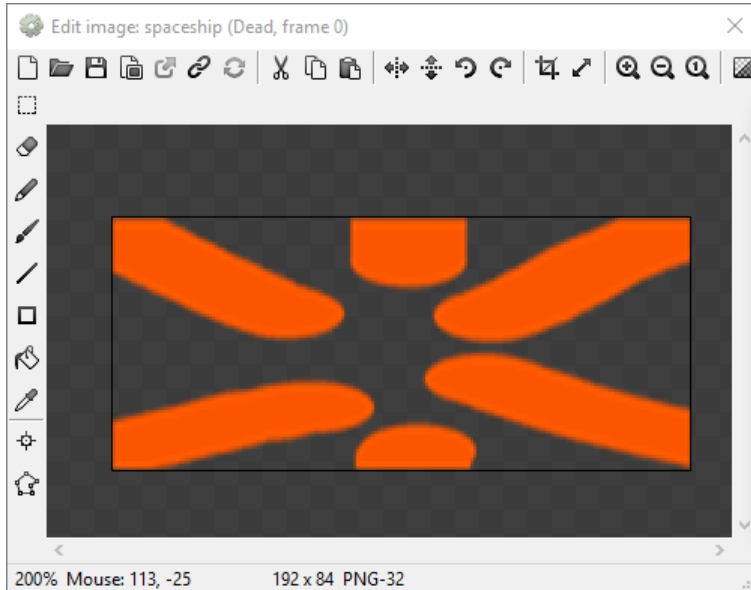
# You Lose

- Display the you lose message if you run out of lives

17	 System	<b>life</b> $\leq$ 0	 player	Destroy
			 youLose	Set position to (240, 260)
			Add action	

# Create the UFO

- Create a new **Sprite**
- Add the UFO as the “**Default**” animation
- Create your own “**Dead**” animation



# Create the UFO

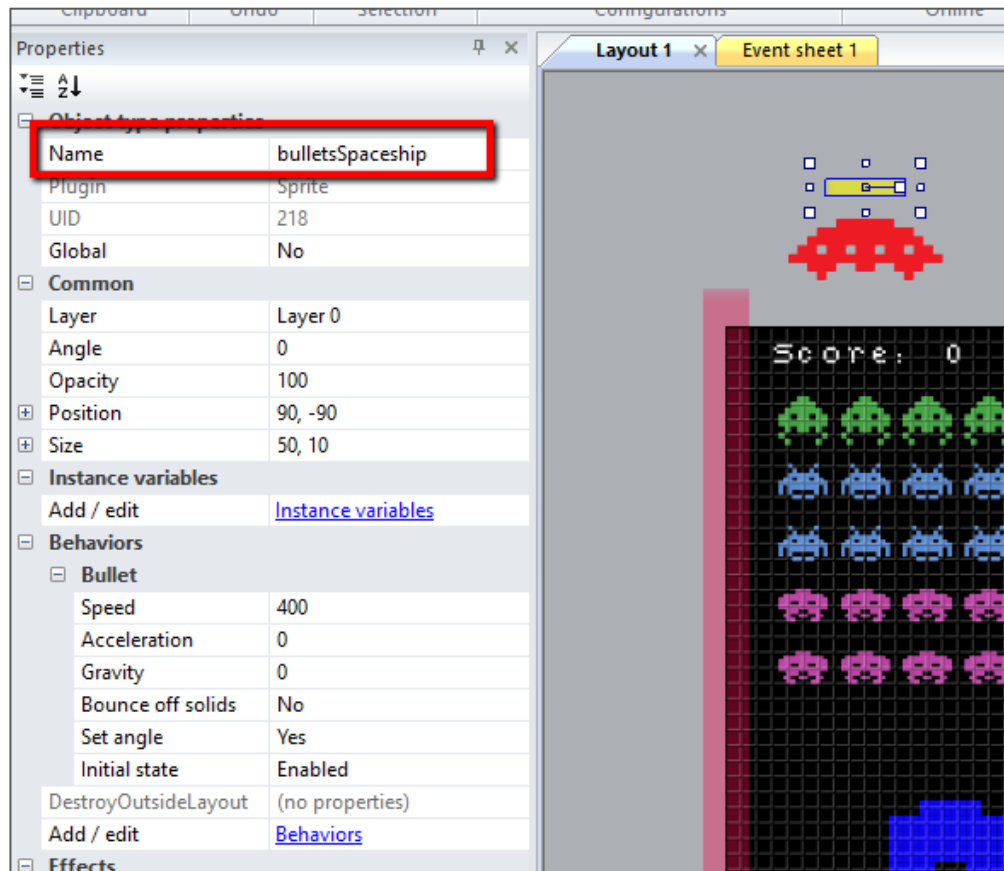
- Name “spaceship”
- Behaviors
  - **Bullet**
  - **Destroy Outside Layout**
  - **Flash**
- Place outside of layout

Add / edit	<a href="#">Instance variables</a>
Behaviors	
Bullet	
Speed	150
Acceleration	0
Gravity	0
Bounce off solids	No
Set angle	Yes
Initial state	Enabled
DestroyOutsideLayout	(no properties)
Flash	(no properties)
Add / edit	<a href="#">Behaviors</a>











# Create UFO Bullet

- Create a Sprite for the UFO bullet
- Name **bulletSpaceship**
- Fill with a solid color (or make an image)
- Make sure it points “**right**”
- Behaviors
  - **Bullet**
  - **Destroy Outside Layout**






# Spawn The UFO

- Every 15 seconds, spawn the UFO and have it randomly shoot at us
- Set the angle of motion to **90** (down)

18	 System	Every <b>15</b> seconds	 System	Create object  <b>spaceship</b> on layer <b>0</b> at (0, 45)
			 System	Wait <b>random(0,6)</b> seconds
			 spaceship	Spawn  <b>bulletsSpaceship</b> on layer <b>0</b> ( <i>image point 0</i> )
			 bulletsSpaceship	Set  Bullet angle of motion to 90 degrees
			Add action	










# UFO Shoots Player

- UFO bullets take a live for our player
- Also, make sure they destroy the shield

19	→  bullets...	On collision with  <b>player</b>	 System	Subtract 1 from <b>life</b>
			 player	Set animation to <b>"Dead"</b> (play from beginning)
			 player	 Flash: Flash 0.1 on 0.1 off for <b>1.0</b> seconds
			Add action	
20	→  bullets...	On collision with  <b>shield</b>	 shield	Destroy
			Add action	




# Shoot the UFO

- Player shoots the UFO and gets 900 points PLUS a bonus life

21	 bullet	On collision with  <b>spaceship</b>	 System	Add 900 to <b>score</b>
			 System	Add 1 to <b>life</b>
			 spaceship	Set animation to <b>"Dead"</b> (play from beginning)
			 spaceship	 Flash: Flash 0.1 on 0.1 off for <b>999</b> seconds
			Add action	
22	 spaces...	On animation "Dead" finished	 spaceship	Destroy
			Add action	

# Go To Next Level

- When there are no more invaders, increase the level and restart layout

23	 System	enemy.Count = 0	 System	Add 1 to <b>level</b>
			 System	Restart layout
			Add action	