

# Centipede

Bugs everywhere!!!!

Play the game we are building:  
**Click**

# Today's Game

**Challenge:** Reproduce a similar version of the iconic Centipede game

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

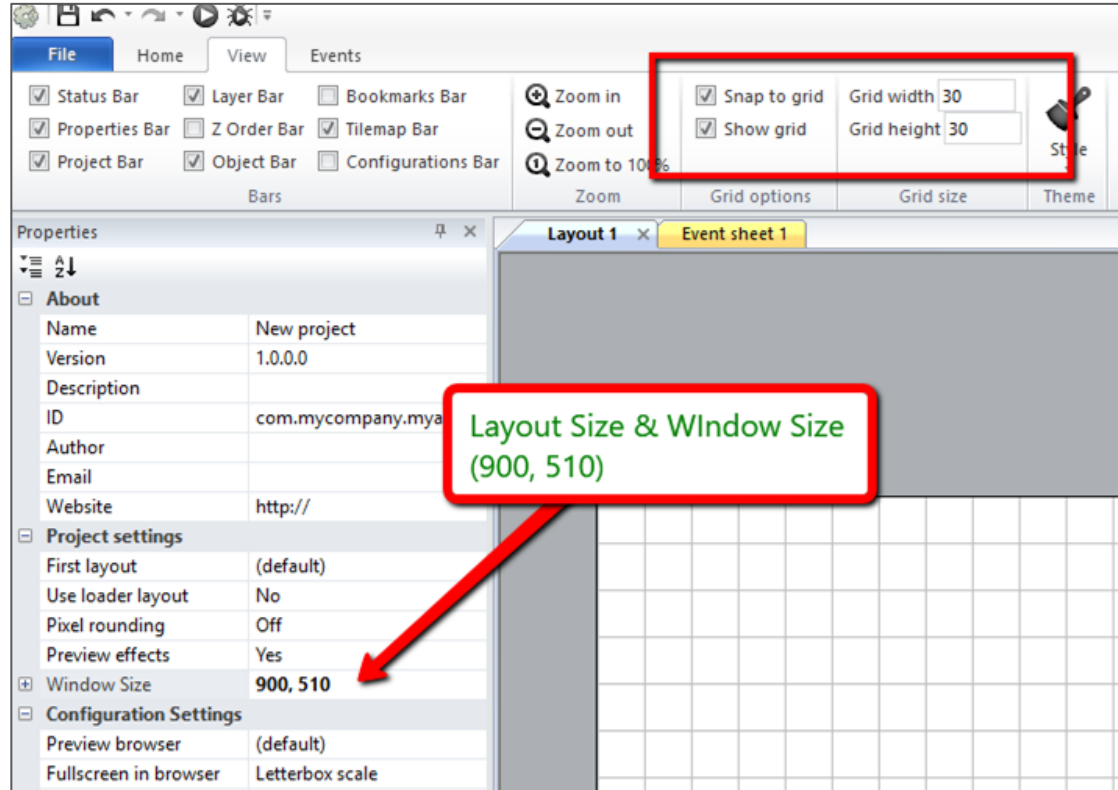
## Features:

- Bugs that auto scan across the screen
- When shot, the bugs turn into obstacles
- The bugs go faster as the game progresses

# Setup Layout

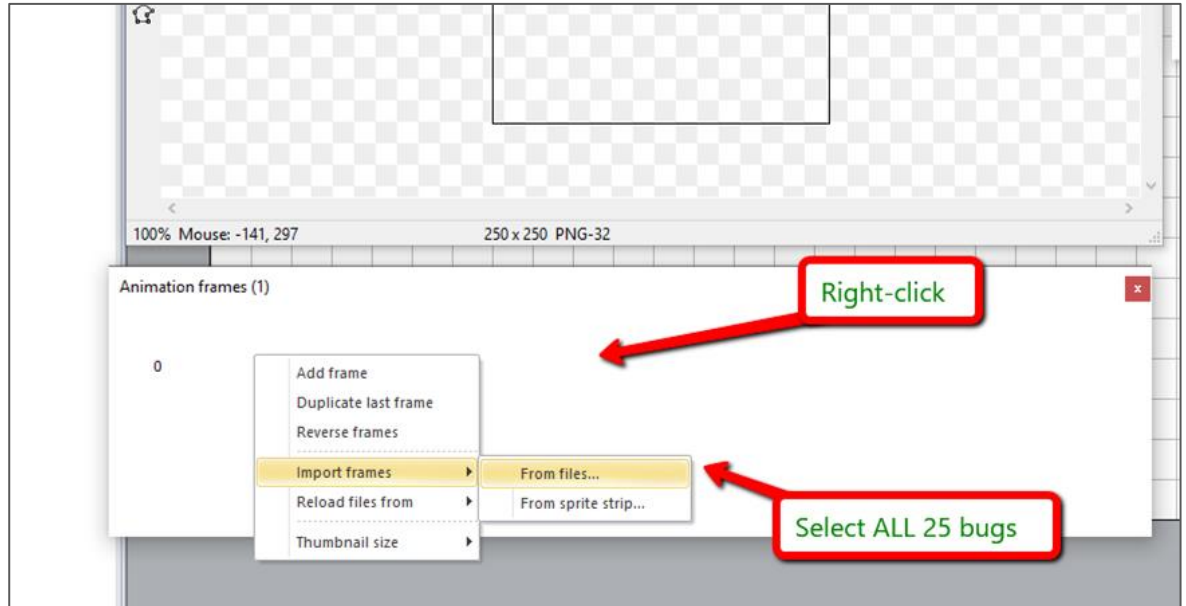
- Layout size (900, 510)
- Windows size (900, 510)
- Enable “snap to grid”
- Enable “show grid”
- Set grid to 30 & 30

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



# Create Bugs

- Import all 25 bugs
- Delete frame 0, which is blank



# Setup Bugs

The screenshot shows the 'Properties' panel on the left with the following settings for the 'Default' animation:

Property	Value
Speed	0
Loop	No
Repeat count	1
Repeat to	0
Ping-pong	No

On the right, the 'Animations' list shows a single entry: 'Default'.

Two red arrows point to the 'Speed' field and the 'Default' animation entry. Red boxes with green text contain the following instructions:

- 2. Set Speed to '0'
- 1. Click on Animations

# Setup Bugs

- Name it “bugs”
- Add Behaviors
  - Bullet
  - Destroy
- Outside of Layout
- Set:
  - Speed: 300
  - Set angle: No

The screenshot shows the Godot engine interface. The Properties panel on the left is expanded to show the 'Behaviors' section. The 'Name' field is set to 'bugs'. The 'Speed' field is set to 300, and the 'Set angle' field is set to No. The Behaviors panel on the right shows two behaviors: 'Bullet' and 'DestroyOutsideLayout'.

Name	Type
Bullet	Bullet
DestroyOutsideLayout	Destroy outside layout

# Create Instance Variable

- This variable will tell the bug what direction it is going.
- Add one instance variable

The screenshot shows a game engine interface with a left-hand panel displaying the properties of an object named 'bug'. The 'Instance variables' section is highlighted, and a red box with the text '1. Click' is positioned over the 'Instance variables' link. A red arrow points from this box to the 'Instance variables' section. A second red arrow points from the 'Type' dropdown menu in the 'New instance variable' dialog to the word 'Boolean'.

Object type properties	
Name	bugs
Plugin	Sprite
UID	0
Global	No

Common	
Layer	Layer 0
Angle	0
Opacity	100
Position	150, -90
Size	30, 30

Instance variables	
Add / edit	<a href="#">Instance variables</a>

Behaviors	
Bullet	
Speed	300
Acceleration	0
Gravity	0
Bounce off solids	No
Set angle	No
Initial state	Enabled
DestroyOutsideLayout	(no properties)
Add / edit	<a href="#">Behaviors</a>

Effects	
Blend mode	Normal

bugs: Instance variables		
Name	Type	Initial value

New instance variable	
Name	goingLeft
Type	Boolean
Initial value	false
Description (optional)	



# Create Player

- New Sprite, name “player”
- Place at the bottom
- Add Behaviors
  - 8-Direction
  - Bound To Layout
- Set:
  - Maxspeed: 500
  - Set angle: No

Object type properties

Name	player
Plugin	Sprite
UID	1
Global	No

Common

Layer	Layer 0
Angle	0
Opacity	100
Position	150, 450
Size	60, 30

Instance variables

Add / edit [Instance variables](#)

Behaviors

8-Direction

Max speed	500
Acceleration	600
Deceleration	500
Directions	8 directions

Set angle **No**

Default controls	Yes
Initial state	Enabled

BoundToLayout

Bound by	Edge
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Add / edit [Behaviors](#)

Effects

Blend mode	Normal
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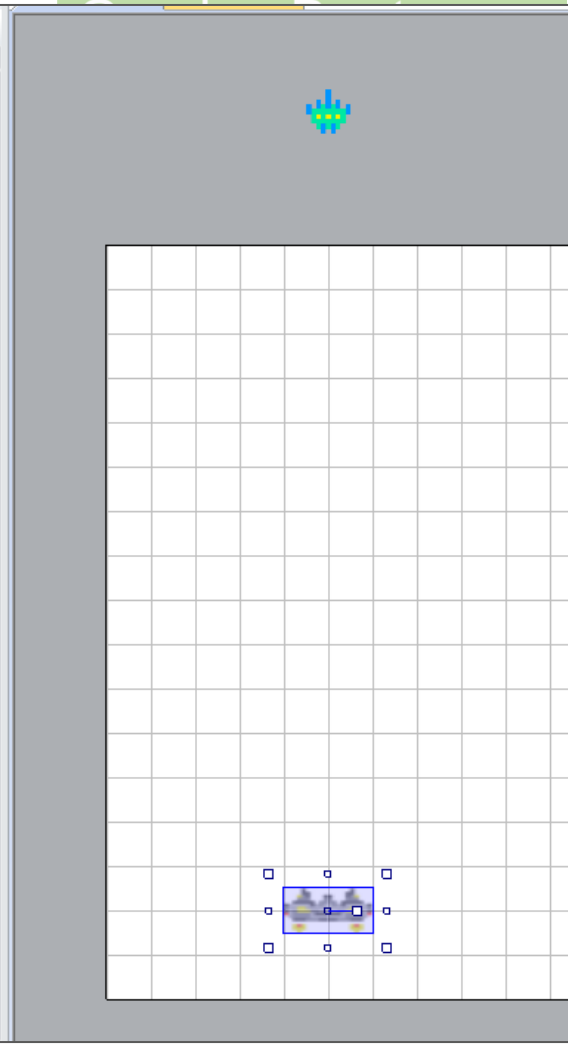
Add / edit [Effects](#)

Container

No container	<a href="#">Create</a>
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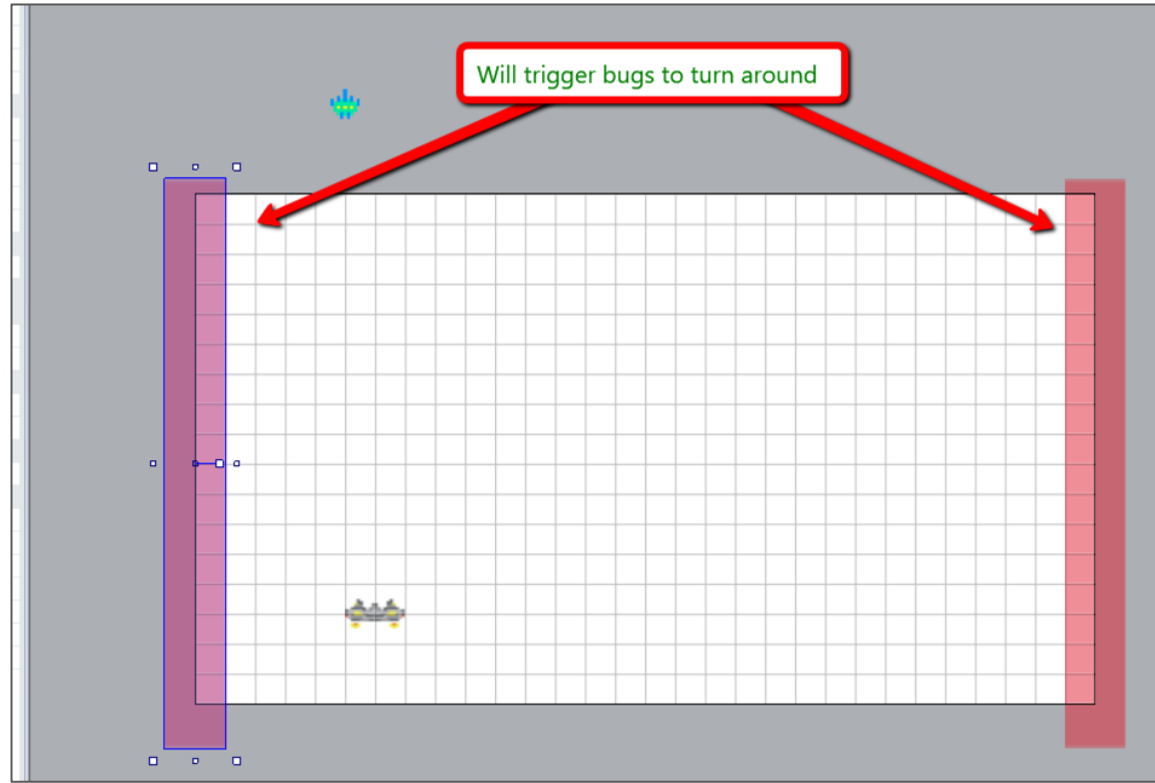
Properties

Animations	<a href="#">Edit</a>
Size	<a href="#">Make 1:1</a>
Initial visibility	Visible
Initial animation	Default
Initial frame	0



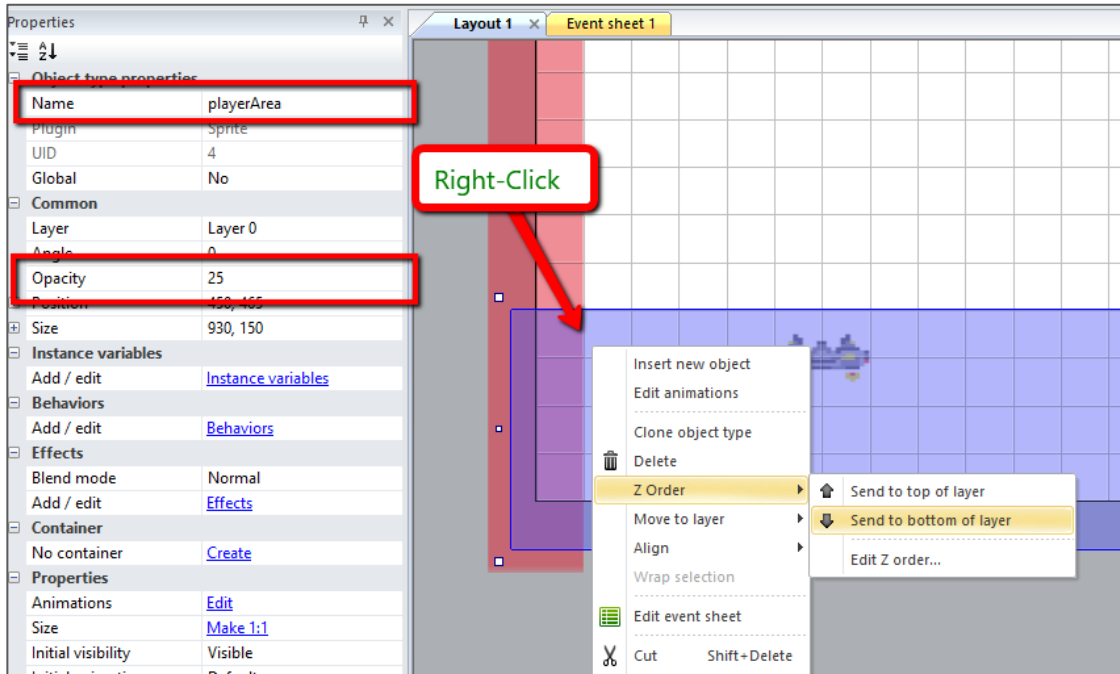
# Add Boundaries

- New Sprite
- Fill in red
- Name “**border**”
- Set Initial Visibility to “**invisible**”
- Add Behavior
  - Solid
- Place one on left & right



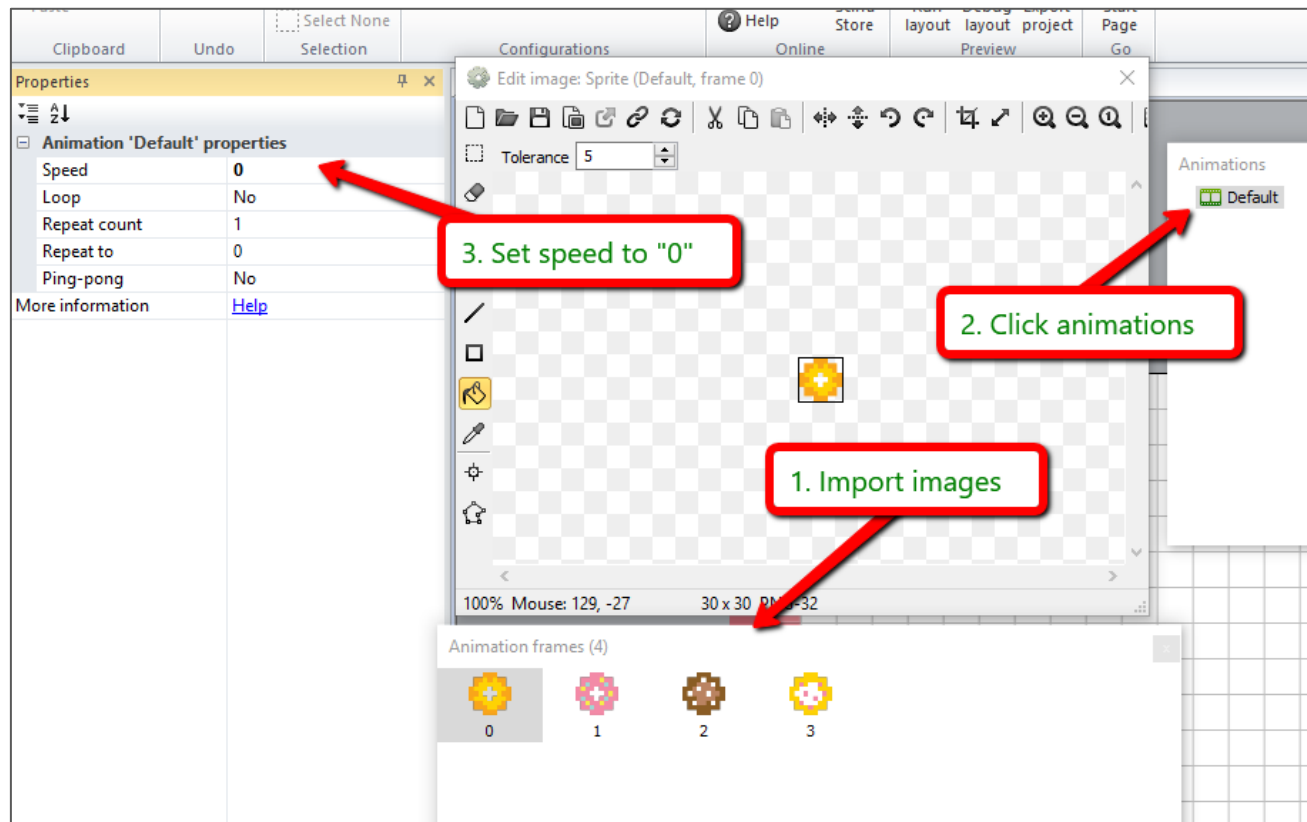
# Add Player Area

- This the where the player will stay.
- New Sprite - name it “**playerArea**” & Opacity to “**25**”
- Adjust Z Order to “**Send to bottom of layout**”



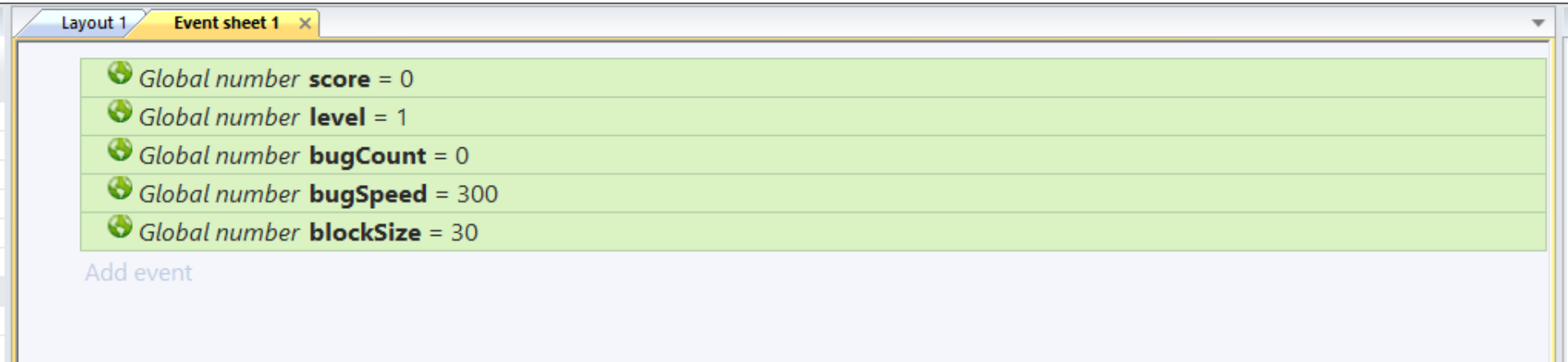
# Add Rocks

- New Sprite
- Import 4 images
- Name “rocks”
- Place outside of layout
- No Behaviors



# Add Global Variables

- These will be used for multiple levels, each getting faster
- Each is type “**Number**” and set the initial value accordingly





The screenshot shows a software interface for editing an event sheet. At the top, there are tabs for "Layout 1" and "Event sheet 1". Below the tabs, a list of five global number variables is displayed, each with a small globe icon to its left. The variables are:

- Global number **score** = 0
- Global number **level** = 1
- Global number **bugCount** = 0
- Global number **bugSpeed** = 300
- Global number **blockSize** = 30

At the bottom left of the event sheet area, there is a link that says "Add event".

# Auto Spawn Bugs

- Every 1 second, spawn a bug
- When we get to 25 bugs, we'll go to the next level

1	System	Every 1 seconds	Add action
2	System	bugCount < 25	System Create object  bugs on layer 0 at (random(0,900), 30)
	bugs		bugs Set animation frame to random(0,25)
	bugs		bugs Set  Bullet speed to bugSpeed
	System		System Add 1 to bugCount

# Turn Bugs Around At Edges

- On collision with a border OR a rock, the bug turns around
  - Sets bullet angle either 0 (right) or 180 (left)
- The first block is an “OR” block after adding 2nd condition
- TEST GAME (bugs should spawn and move down the screen)

3	bugs 	On collision with <b>border</b> - or - On collision with <b>rocks</b>	bugs   Set Y to <i>bugs.Y + blockSize</i> bugs   Toggle <b>goingLeft</b> bugs   Set  Bullet angle of motion to 0 degrees Add action
	4	bugs   Is <b>goingLeft</b> Add action	bugs   Set  Bullet angle of motion to 180 degrees Add action

# Player Can Shoot!

- Add Keyboard
- Add Sprite for bullet
  - Solid black (or other color)
  - Size is 10,10
  - Name “bullet”
- Add Behaviors
  - Bullet
  - Destroy Outside Layout

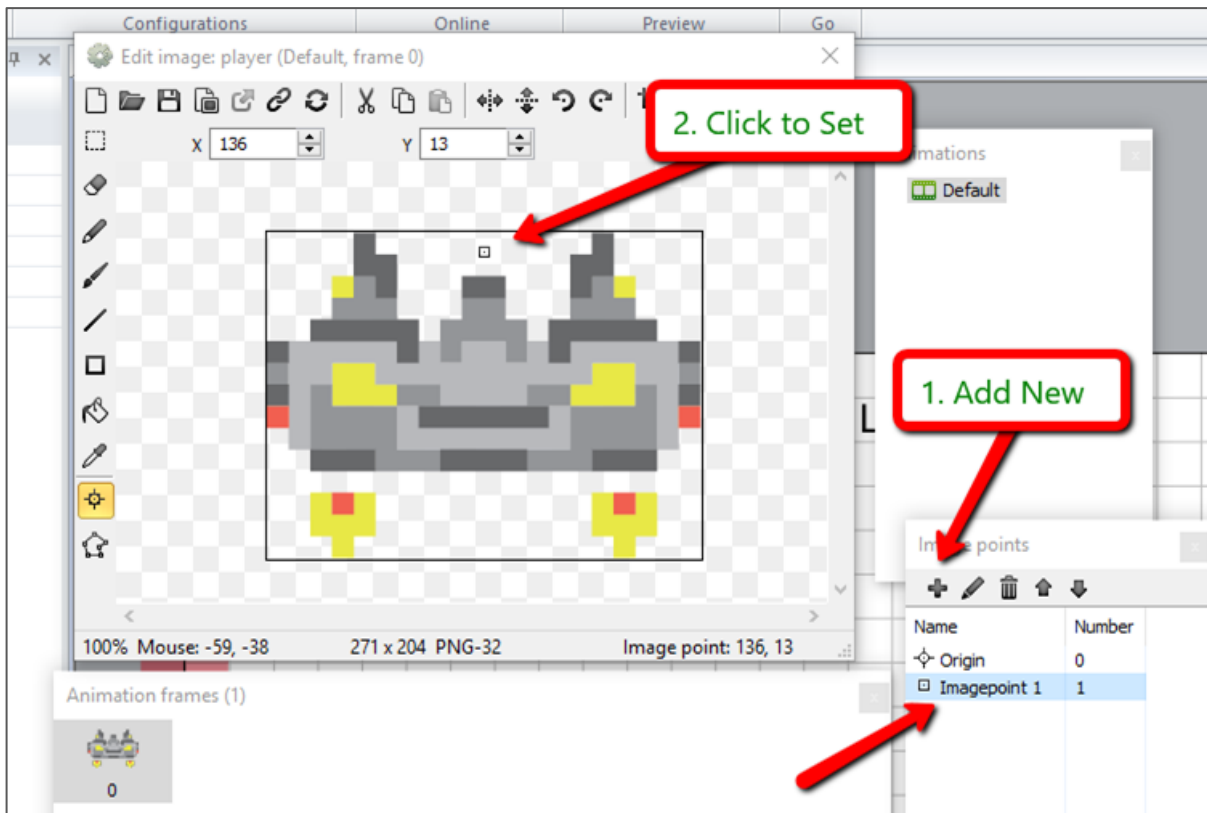
The screenshot shows the 'Object type properties' panel for a 'bullet' object. The 'Name' is 'bullet', 'Size' is '10, 10', and 'Position' is '-60, 240'. Under 'Behaviors', the 'Bullet' behavior is configured with 'Speed' 400, 'Acceleration' 0, 'Gravity' 0, 'Bounce off solids' No, 'Set angle' Yes, and 'Initial state' Enabled. The 'DestroyOutsideLayout' behavior is also present. The background shows a game grid with a player character and a boat.

Object type properties	
Name	bullet
Plugin	Sprite
UID	7
Global	No
Common	
Layer	Layer 0
Angle	0
Opacity	100
Position	-60, 240
Size	10, 10
Instance variables	
Add / edit	<a href="#">Instance variables</a>
Behaviors	
<input checked="" type="checkbox"/> Bullet	
Speed	400
Acceleration	0
Gravity	0
Bounce off solids	No
Set angle	Yes
Initial state	Enabled
DestroyOutsideLayout	(no properties)
Add / edit	<a href="#">Behaviors</a>
Effects	
Blend mode	Normal
Add / edit	<a href="#">Effects</a>
Container	
No container	<a href="#">Create</a>
Properties	
Animations	<a href="#">Edit</a>





# Player Can Shoot!

- Add a new image point for our bullet










# Player Can Shoot!

- Spawn a bullet at “**image point 1**”
- Allow a max of 3 bullets to be on the screen at once
- Set the bullet to go up (angle = 270 degrees)

5	 Keybo...	On <b>Space</b> pressed	 player	Spawn	▪ <b>bullet</b> on layer <b>0</b> ( <i>image point 1</i> )
	 System	bullet.Count ≤ 3	▪ bullet	Set 	Bullet angle of motion to <i>270</i> degrees
Add action					

# Destroy Bugs & Spawn Rocks

- When a bug is shot, it spawns a rock in its place
- Keep track of the score - the bug animation decided the number of points.
- TEST GAME (shoot bugs, turn into rocks, player moves around the screen)

6	 • bullet	On collision with  <b>bugs</b>	 bugs   Destroy
			• bullet   Destroy
			 bugs   Spawn  <b>rocks</b> on layer <b>0</b> ( <i>image point 0</i> )
			 rocks   Set animation frame to <b>random(0,4)</b>
			 System   Add $100 * \text{bugs.AnimationFrame}$ to <b>score</b>
			Add action

# Keep the Player In His Area










- Limit the player from removing his player area
- Use “**playerArea.BBoxTop**” for value.

7	 player	$Y \leq \text{playerArea.BBoxTop}$	 player	Set Y to <i>playerArea.BBoxTop</i>
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Add action

# Shoot Rocks!!!

- Each time a rock is shot, you get 10 points.
- Rocks change their animation frame until they get to the first frame and then they get destroyed (1 to 4 hits)

8	 bullet  rocks	On collision with  rocks	 Destroy  System Add 10 to <b>score</b>
			Add action
9	 rocks	Animation frame > 0	 rocks Set animation frame to <b>rocks.AnimationFrame-1</b>
			Add action
10	 System	Else	 rocks Destroy
			Add action

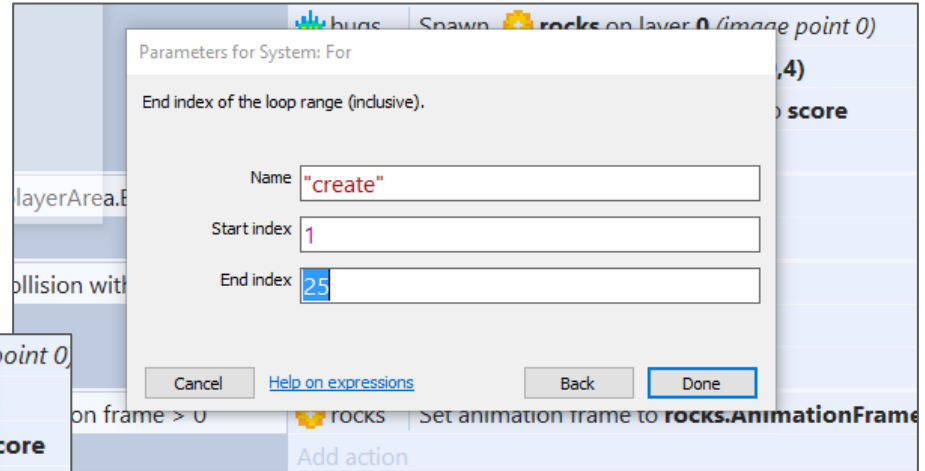
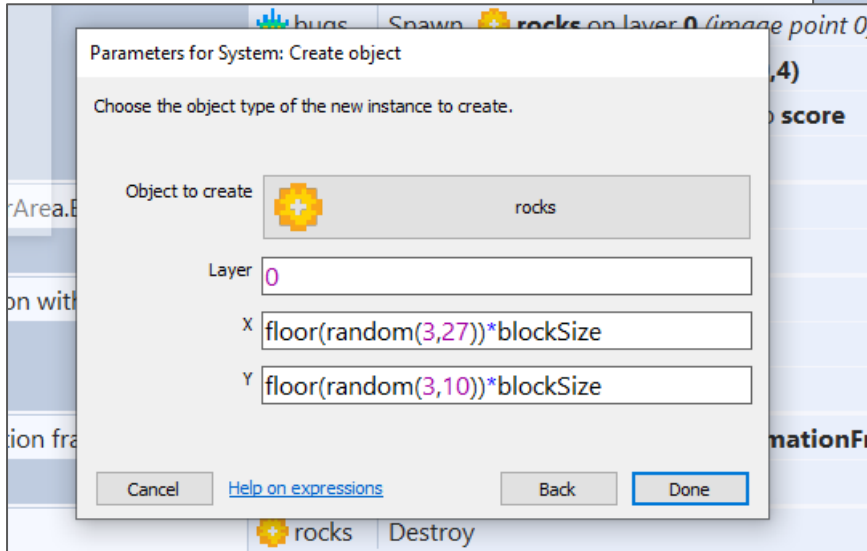
# Prevents Rocks in Player Area

- Let's not allow rocks to get created in the player area
- Because we cannot easily shoot them
- TEST GAME

11	 rocks	Is overlapping  <b>playerArea</b>	 rocks   Destroy
			Add action

# Auto Create Rocks On Game Start

- Do this “25” times
  - Create a rock at a random location



- X:  
 **$\text{floor}(\text{random}(3,27)) * \text{blockSize}$**
- Y:  
 **$\text{floor}(\text{random}(3,10)) * \text{blockSize}$**

# Auto Create Rocks On Game Start

- And use the last animation frame for all new rocks so that they must be hit 3-times
- TEST!!

12	System	On start of layout	Add action
13	System	For "create" from 1 to 25	System
			Create object <b>rocks</b> on layer <b>0</b> at $(\text{floor}(\text{random}(3,27)) * \text{blockSize} , \text{floor}(\text{random}(3,10)) * \text{blockSize} )$
			rocks
			Set animation frame to <b>3</b>
			Add action