

# Using Game Maker 8: A Simulation

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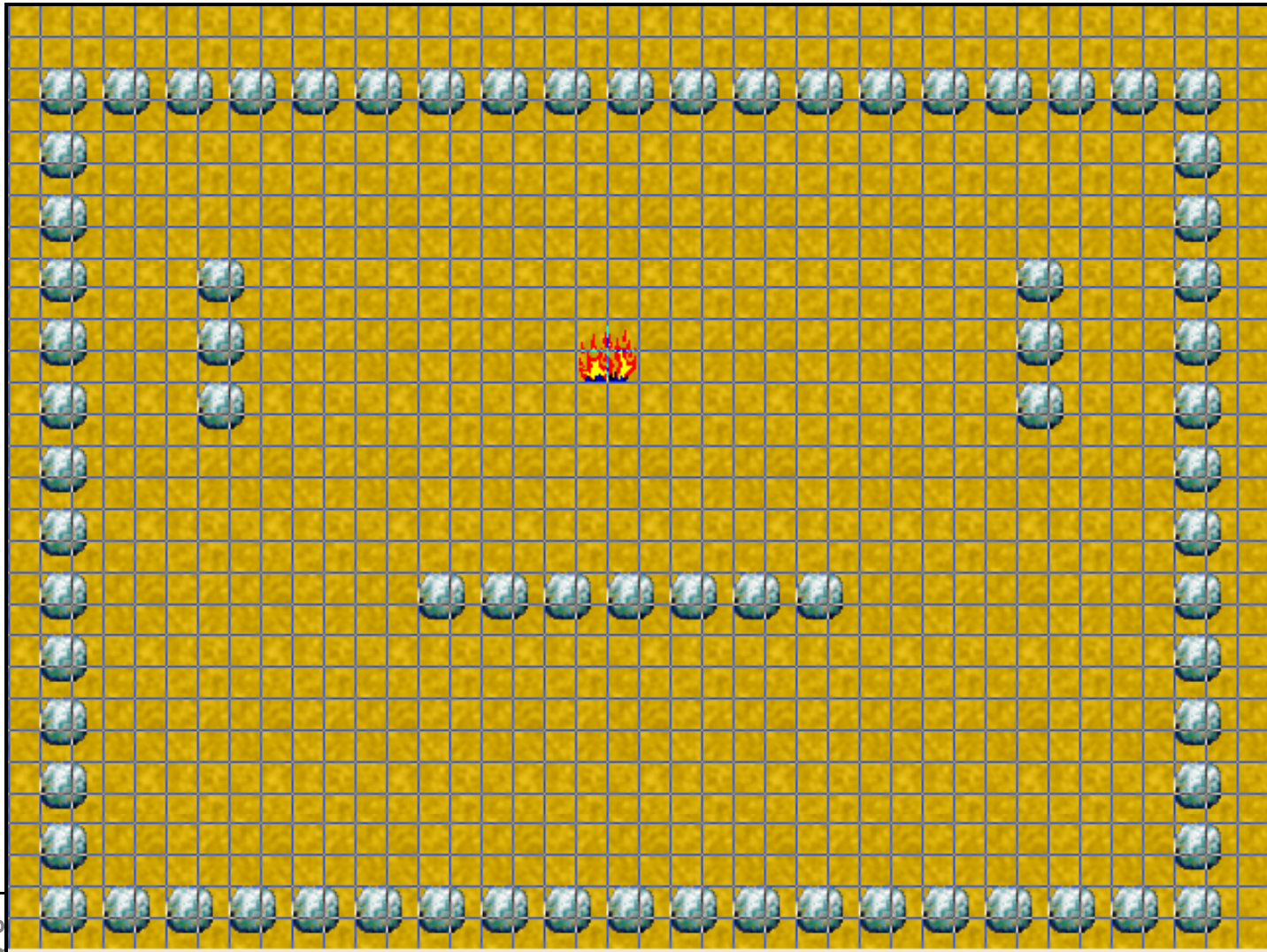
<http://cs.oregonstate.edu/~mjb/gamemaker>

**Oregon State University**



## Let's Start with Just a Simulation

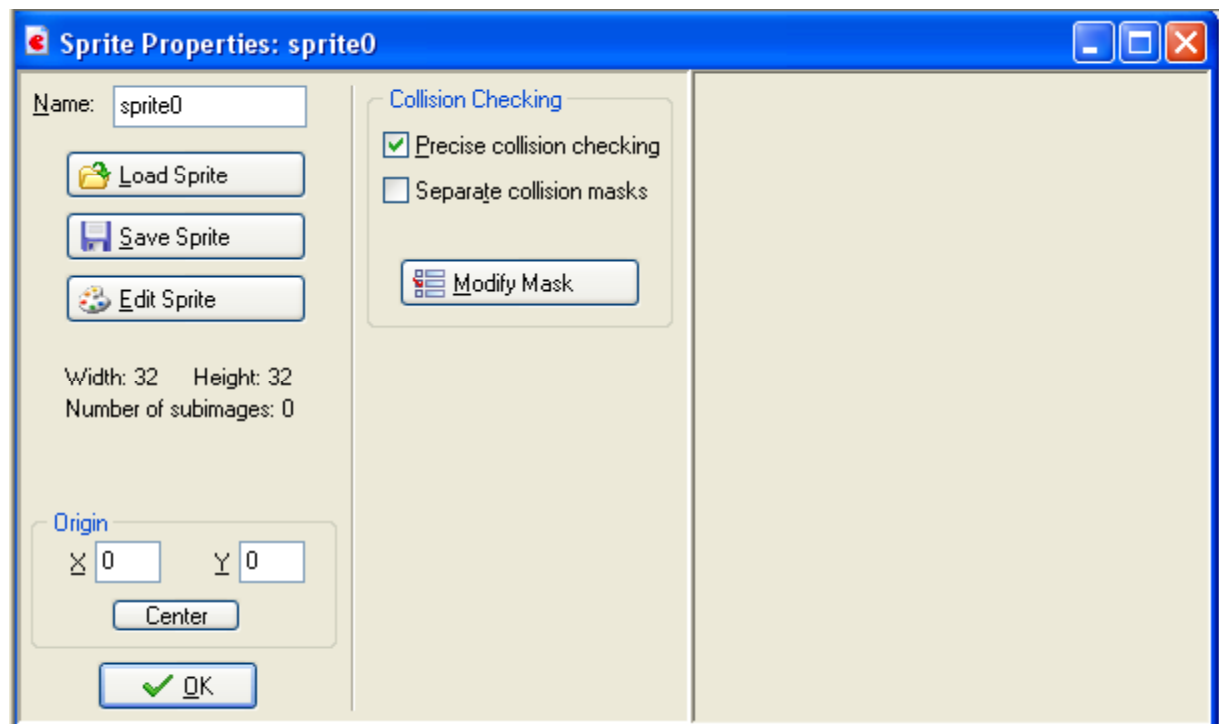
1. A fire bounces around off walls, forever and ever



## Creating a Sprite

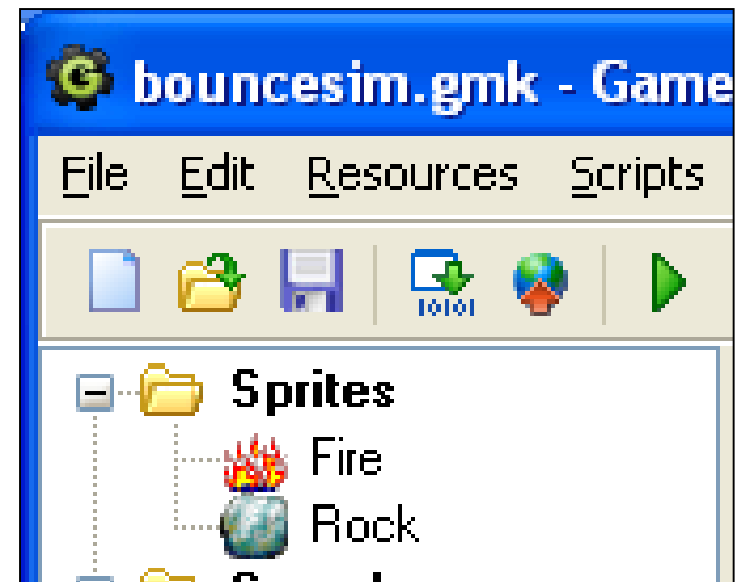
1. Select **Resources**→**Create Sprite**
2. Type in a name for this sprite
3. Click **Load Sprite**
4. Navigate to where your Sprite folder is (depends where you installed Game Maker)
5. Pick one
6. Click **OK**

The sprites are just images - you can create your own. (Use the .gif or .ico format.)



## Define Two Sprites: Resources→Create Sprite

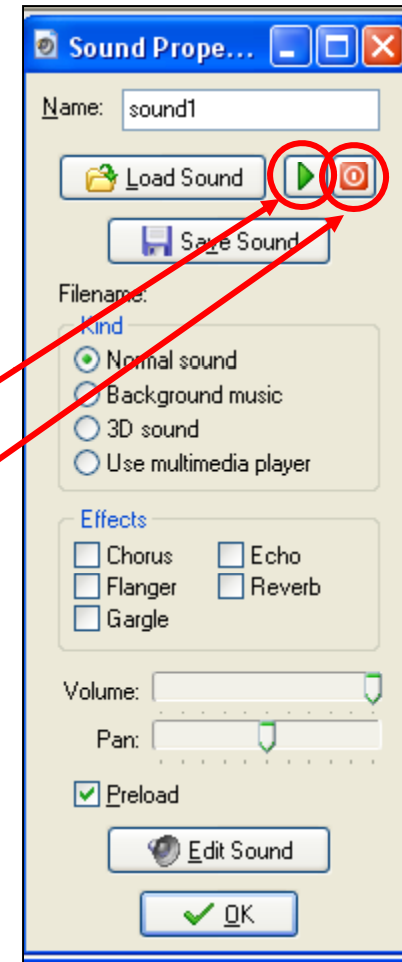
1. Fire = **Sprites** → **various** → **Fire.ico**
2. Rock = **Sprites** → **maze** → **rock.gif**



## Creating a Sound

1. Select **Resources**→**Create Sound**
2. Type in a name for this sprite
3. Click **Load Sound**
4. Navigate to where your Sound folder is (depends where you installed Game Maker)
5. Pick one
6. If you want to check what it sounds like, click the green arrow
7. If you click the green arrow, the sound will start playing over and over (yuch). Click the red thing to turn it off.
8. Click **OK**

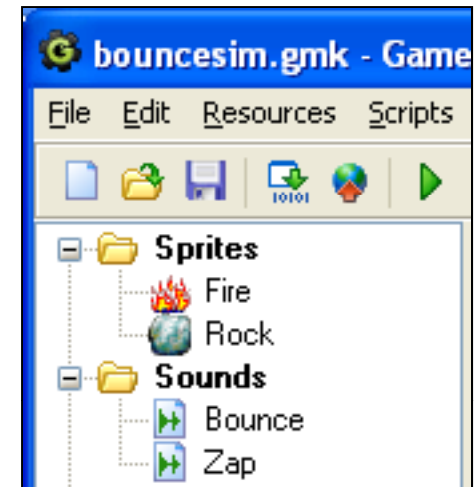
You can create your own sounds. Use the .wav format.



## Define a Bouncing Sound : Resources→Create Sound

Bounce = **Sounds** → boink2.wav

Also, while we're at it:

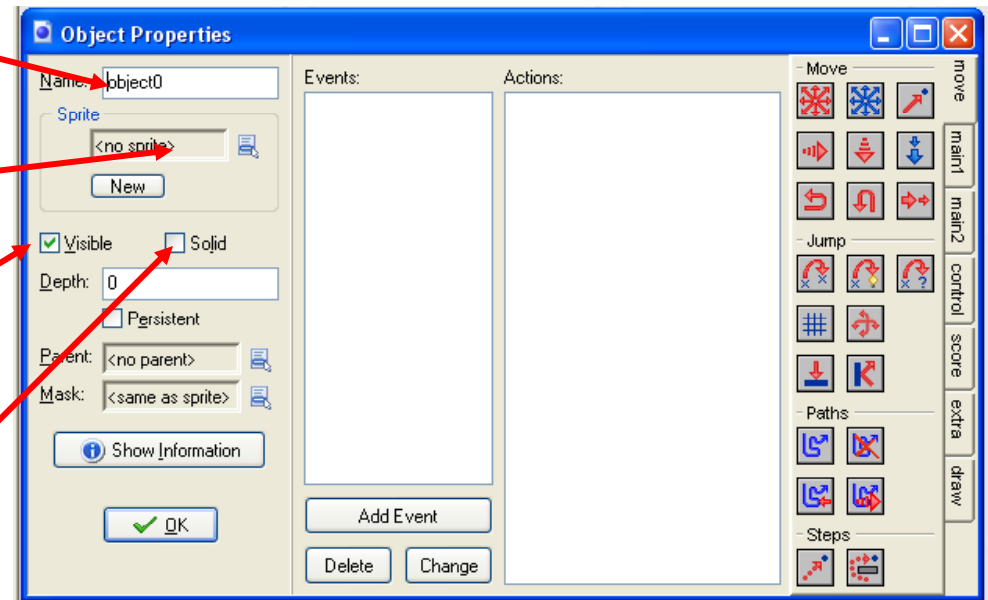


## Define the Background: Resources→Create Background

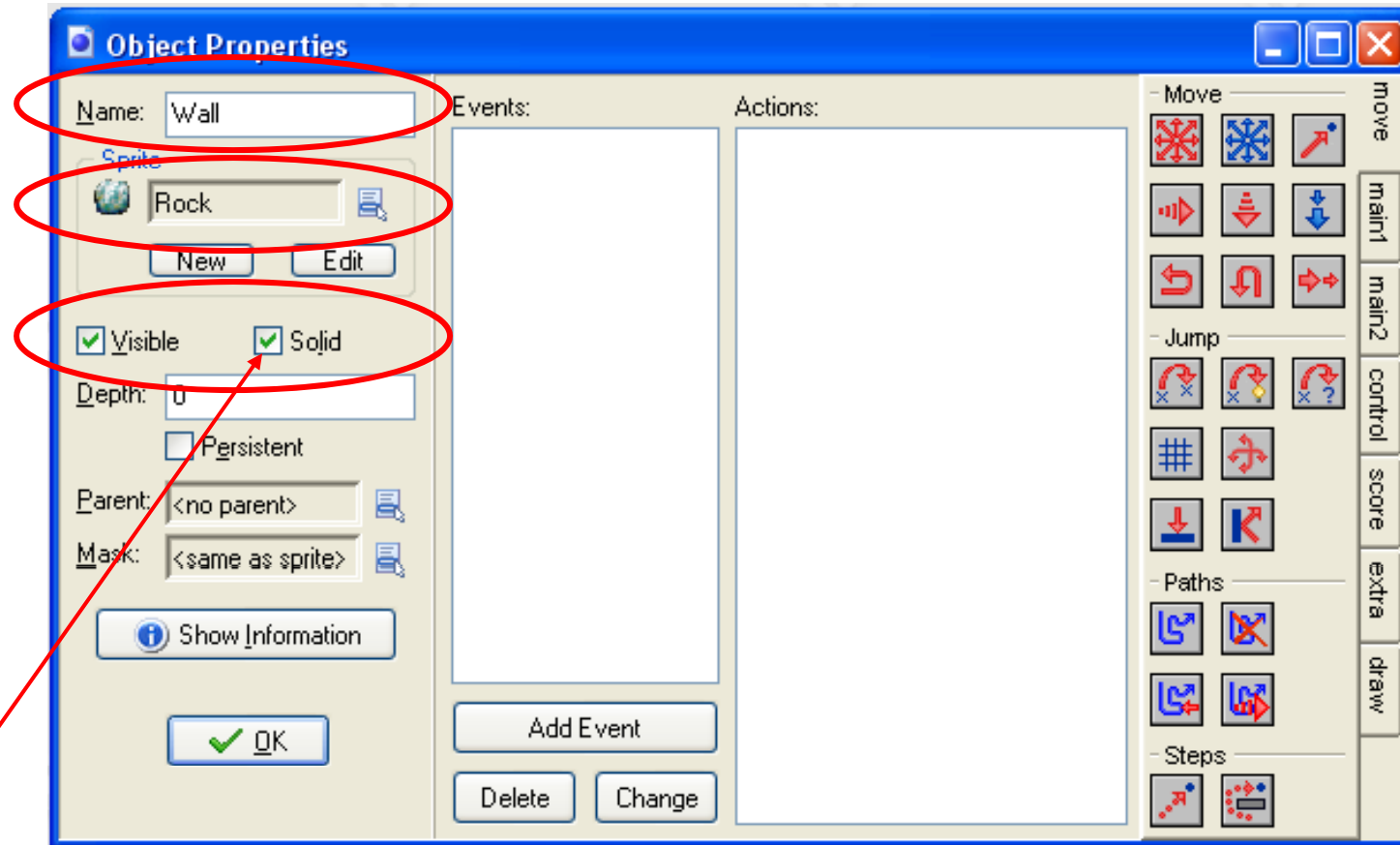
Background = **Backgrounds** → sand1.gif

## Creating an Object

1. Select **Resources**→**Create Object**
2. Type in a name for this object
3. Select a sprite to represent this object from the **Sprite** pull-down menu
4. Click **Visible** if you want this object to be seen during the game
5. Click **Solid** if you want the object to be a solid that something can bounce off of, like a wall



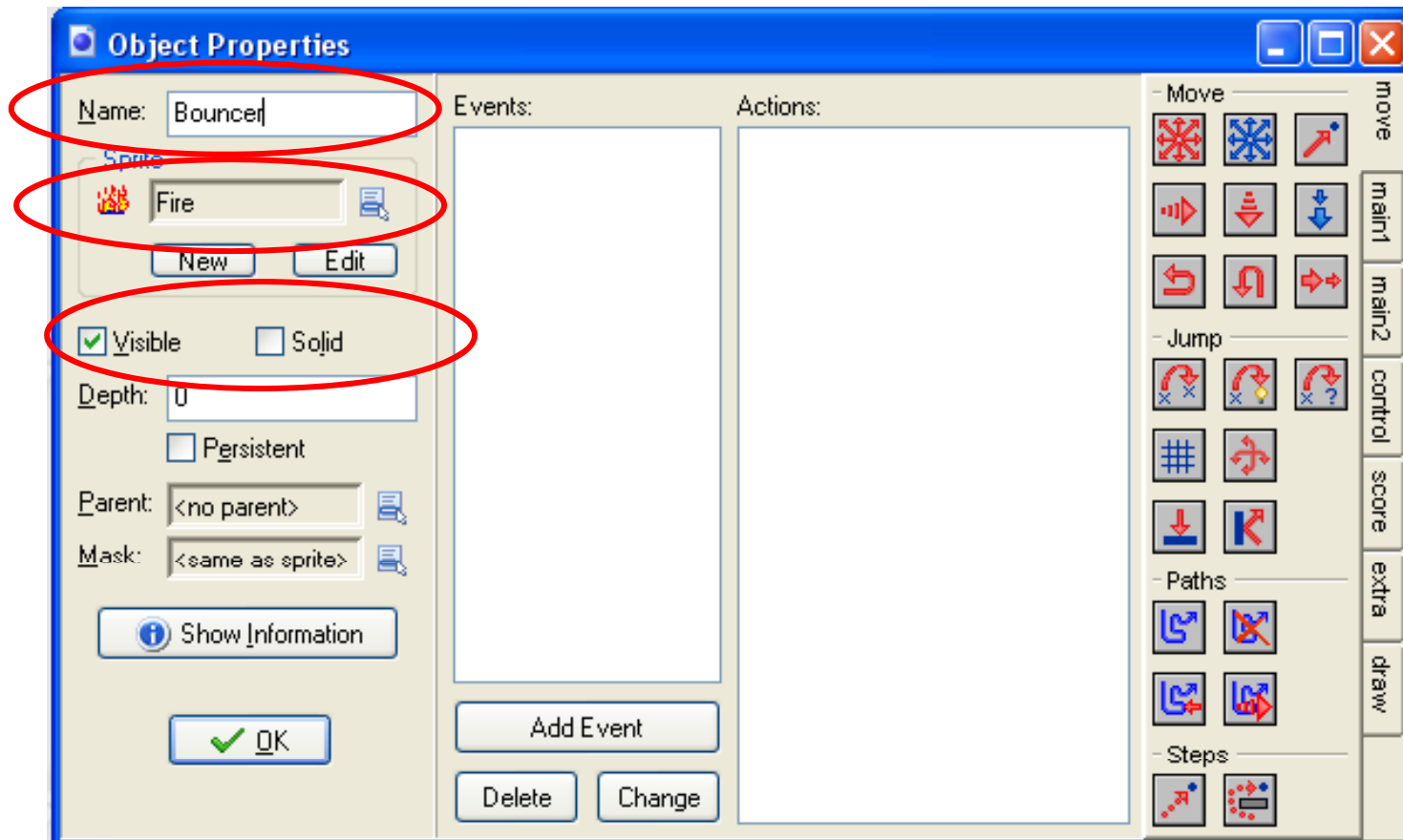
## Define the Wall Object: Resources→Create Object



The wall is "Solid" because something (the fire) will need to bounce off of it



## Define the Bouncer Object: Resources→Create Object

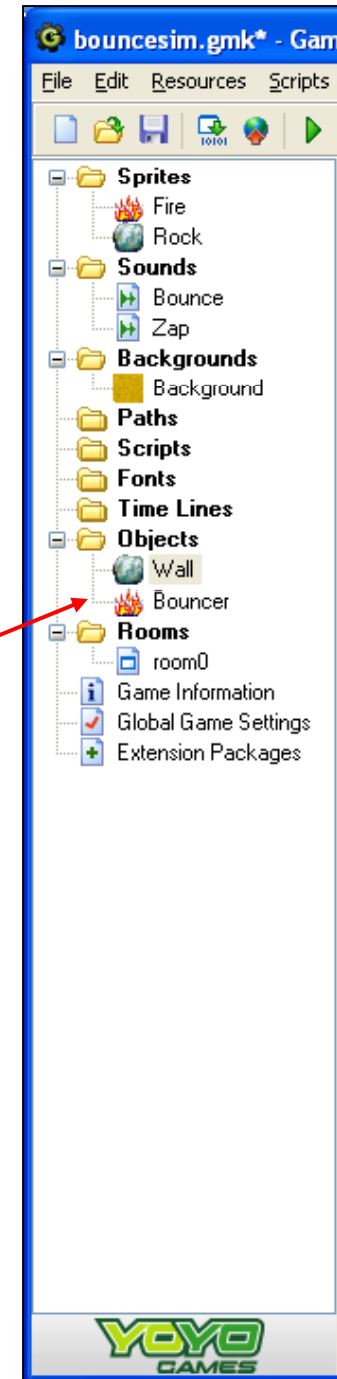


## Editing something that you've created

To go back and edit something that you've previously created, double-click on it in this menu area

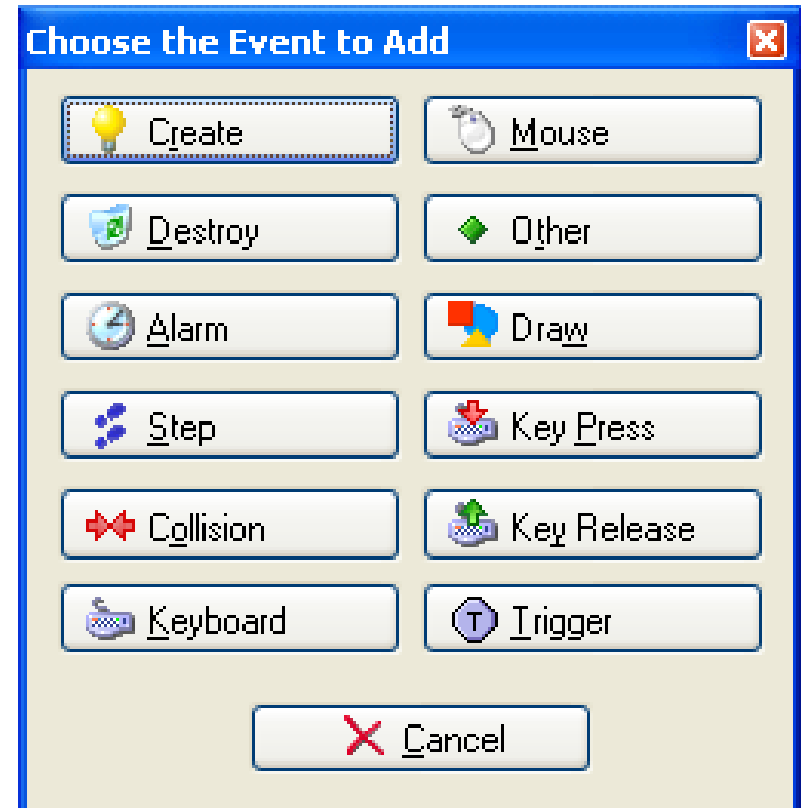


For example, to go back and add events and actions, double-click on one of the objects

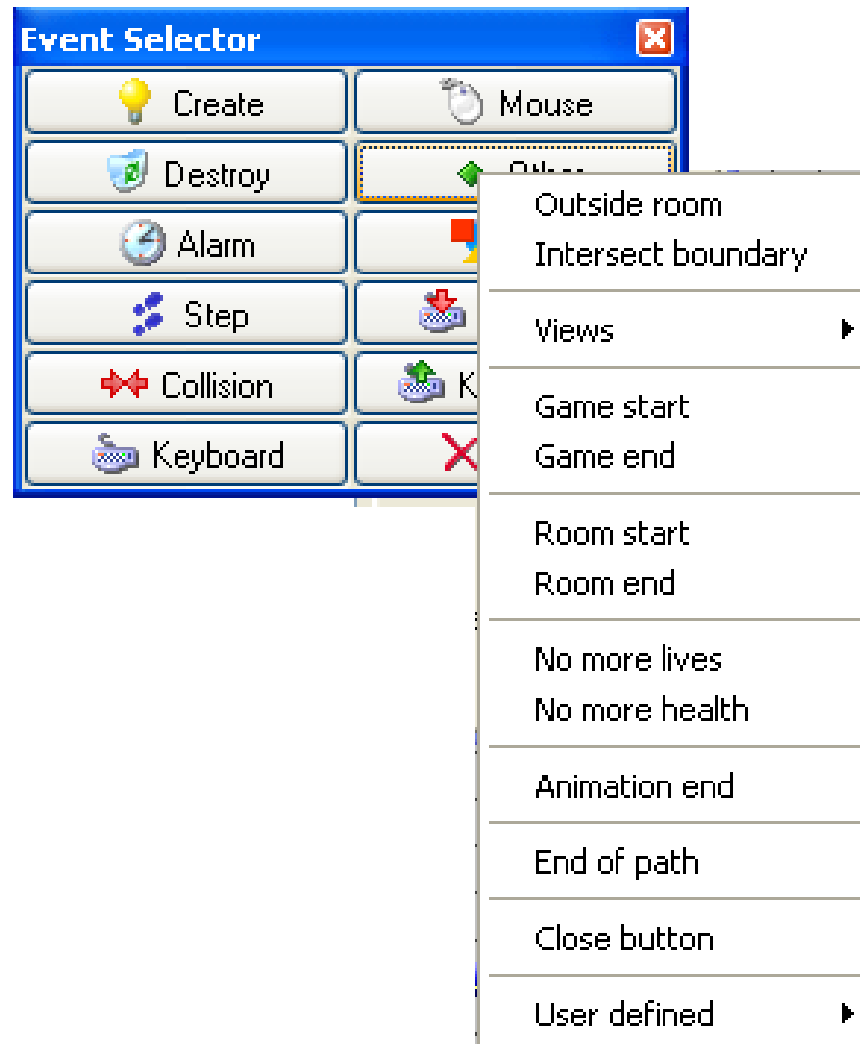


## Adding an Event to an Object with the Event Selector

- This menu allows you to select what will trigger this event
- Some of these events will bring up other dialog boxes to let you be more specific. For example, the **Mouse** event button will bring up another dialog box to let you specify what the mouse has to do (buttons, press/release, moving, etc.) to trigger this event.
- You then drag and drop into the **Actions area** as many actions as this Event will cause to happen

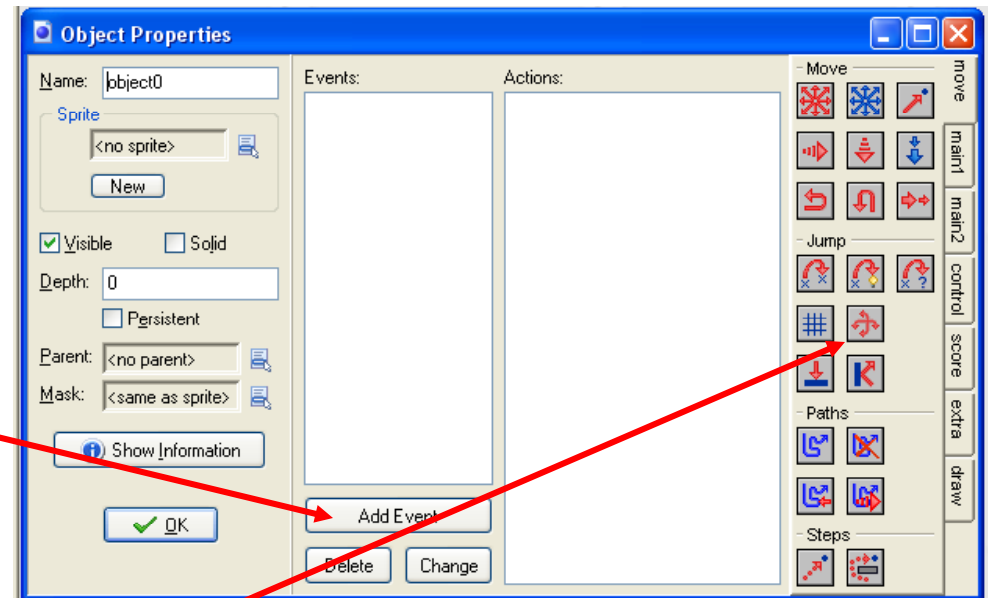


## The “Other” Event List



## Creating an Object's Events and Actions

1. If you want events associated with this object click **Add Event**
2. Select what will trigger the event from the **Event Selector**
3. Drag and drop what Action(s) this Event will cause from the action icons into the **Action area**.



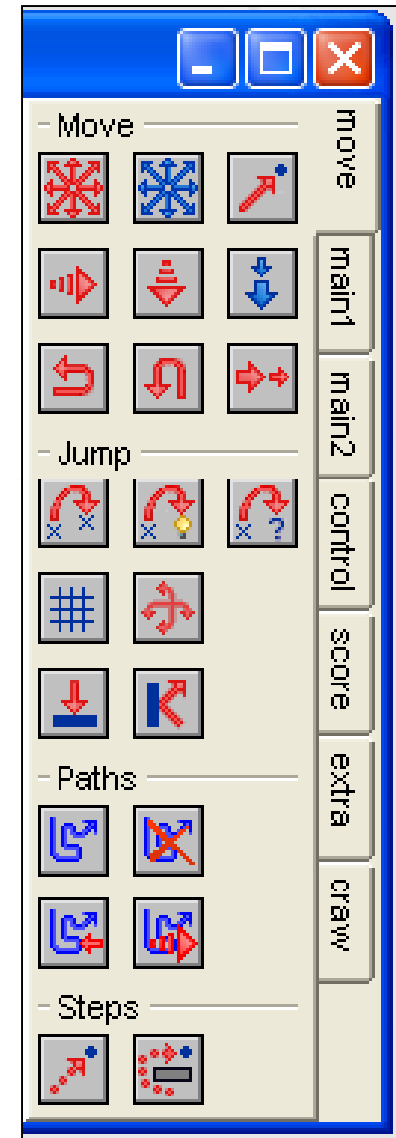
## Move Actions

**Move Fixed**  
**Move Free**  
**Move Towards**  
**Speed Horizontal**  
**Speed Vertical**  
**Set Gravity**  
**Reverse Horizontal**  
**Reverse Vertical**  
**Set Friction**

**Jump to Position**  
**Jump to Start**  
**Jump Random**  
**Align to Grid**  
**Wrap Screen**  
**Move to Contact**  
**Bounce**

**Set Path**  
**End Path**  
**Path Position**  
**Path Speed**

**Step Toward**  
**Step Avoiding**



## Main1 Actions

**Create Instance**

**Create Moving**

**Create Random**

**Change Instance**

**Destroy Instance**

**Destroy at Position**

**Change Sprite**

**Transform Sprite (Pro Edition only)**

**Color Sprite (Pro Edition only)**

**Play Sound**

**End Sound**

**Check Sound**

**Previous Room**

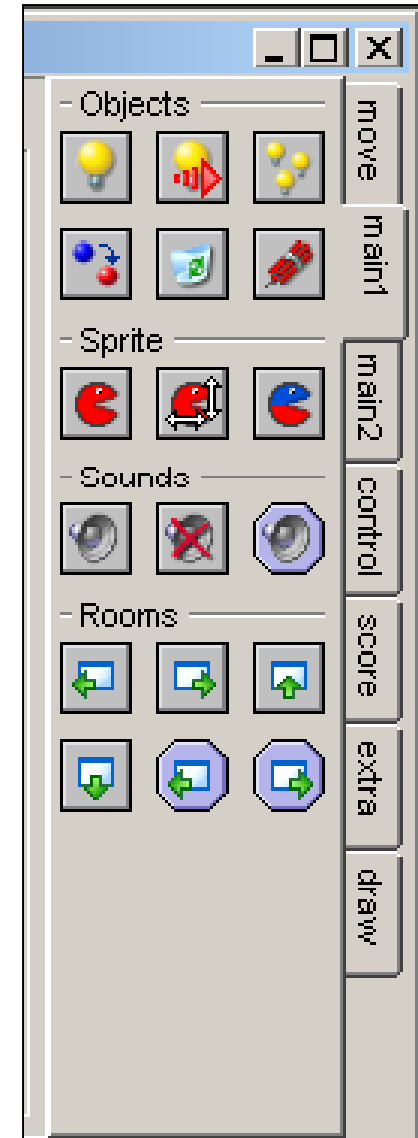
**Next Room**

**Restart Room**

**Different Room**

**Check Previous**

**Check Next**



## Main2 Actions

**Set Alarm**

**Sleep**

**Set Time Line**

**Time Line Position**

**Time Line Speed**

**Start Time Line**

**Pause Time Line**

**Stop Time Line**

**Display Message**

**Show Info**

**Splash Text (Pro Edition only)**

**Splash Image (Pro Edition only)**

**Splash Webpage (Pro Edition only)**

**Splash Video (Pro Edition only)**

**Splash Settings (Pro Edition only)**

**Restart Game**

**End Game**

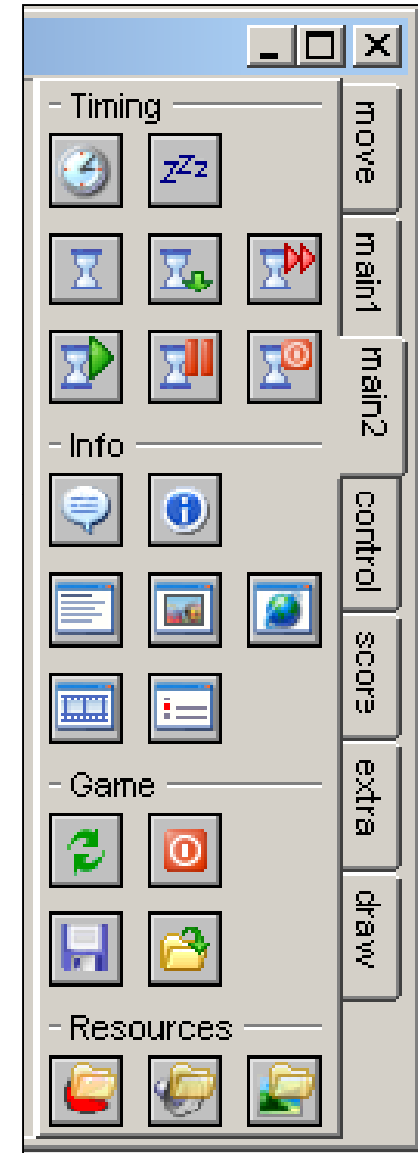
**Save Game**

**Load Game**

**Replace Sprite (Pro Edition only)**

**Replace Sound (Pro Edition only)**

**Replace background (Pro Edition only)**





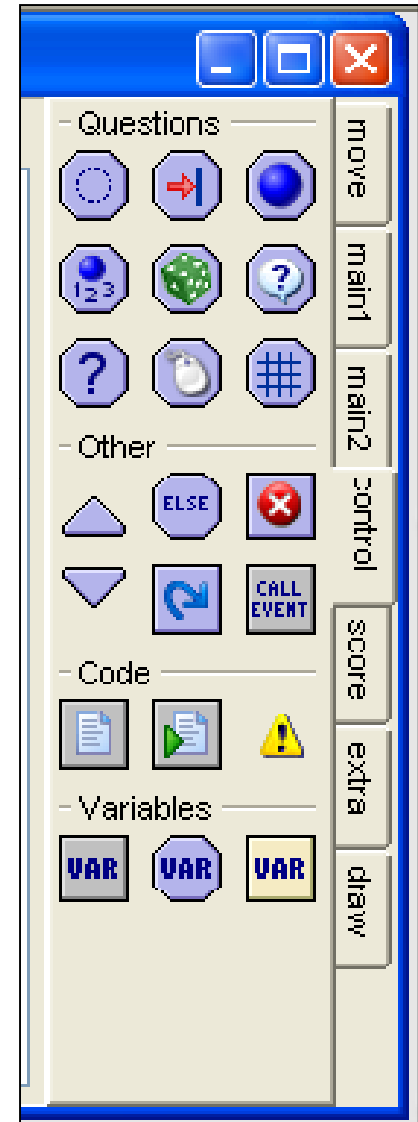
## Control Actions

Check Empty  
Check Collision  
Check Object  
Test Instance Count  
Test Chance  
Test Question  
Test Expression  
Check Mouse  
Check Grid

Start Block  
Else  
Exit Event  
End Block  
Repeat  
Call Parent Event

Execute Code  
Execute Script  
Comment

Set Variable  
Test Variable  
Draw Variable

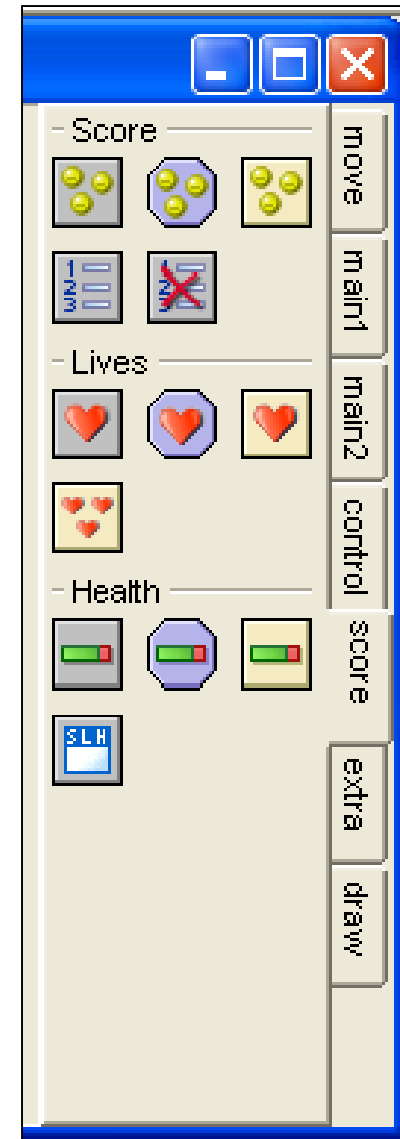


## Score Actions

**Set Score**  
**Test Score**  
**Draw Score**  
**Show Highscore**  
**Clear Highscore**

**Set Lives**  
**Test Lives**  
**Draw Lives**  
**Draw Life Images**

**Set Health**  
**Test Health**  
**Draw Health**  
**Score Caption**

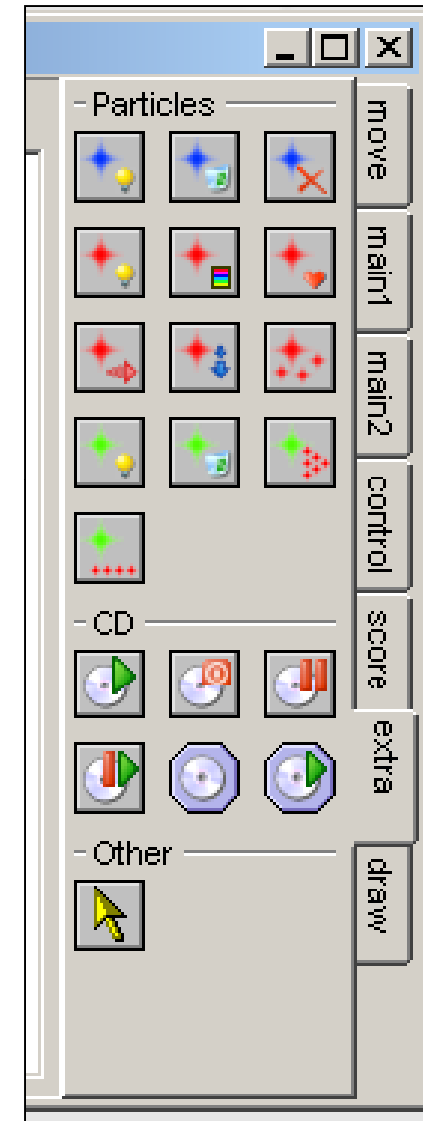


## Extra Actions

**Create Particle System (Pro Edition only)**  
**Destroy Particle System (Pro Edition only)**  
**Clear Particle System (Pro Edition only)**  
**Create particle (Pro Edition only)**  
**Particle Color (Pro Edition only)**  
**Particle Life (Pro Edition only)**  
**Particle Speed (Pro Edition only)**  
**Particle Gravity (Pro Edition only)**  
**Particle Secondary (Pro Edition only)**  
**Create Emitter (Pro Edition only)**  
**Destroy Emitter (Pro Edition only)**  
**Burst From Emitter (Pro Edition only)**  
**Stream from Emitter (Pro Edition only)**

**Play CD (Pro Edition only)**  
**Stop CD (Pro Edition only)**  
**Pause CD (Pro Edition only)**  
**Resume CD (Pro Edition only)**  
**Check CD (Pro Edition only)**  
**Check CD Playing (Pro Edition only)**

**Set Cursor (Pro Edition only))**

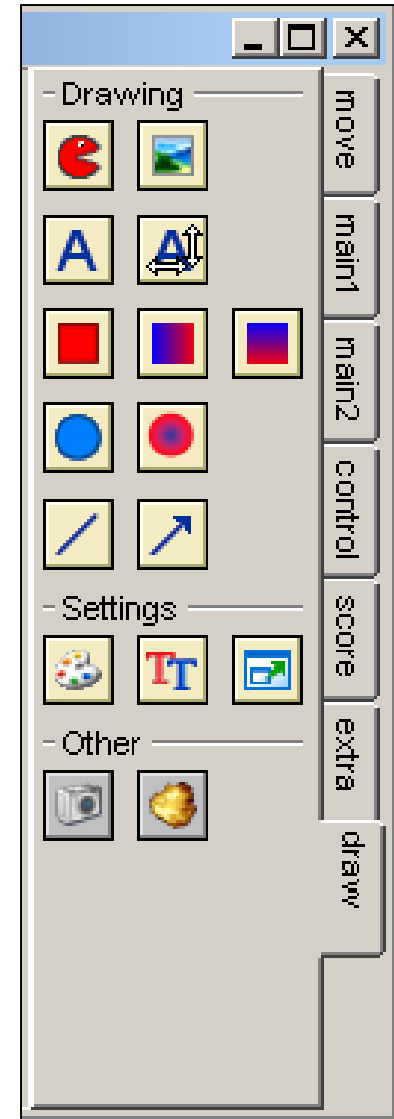


## Draw Actions

**Draw Sprite**  
**Draw Background**  
**Draw Text**  
**Draw Scaled Text (Pro Edition only)**  
**Draw Rectangle**  
**Horizontal Gradient (Pro Edition only)**  
**Vertical Gradient (Pro Edition only)**  
**Draw Ellipse**  
**Gradient Ellipse (Pro Edition only)**  
**Draw Line**  
**Draw Arrow**

**Set Color**  
**Set Font**  
**Set Full Screen**

**Take Snapshot (Pro Edition only)**  
**Create Effect (Pro Edition only)**



# A Handy List of Game Maker Actions and What Tab to Find them Under

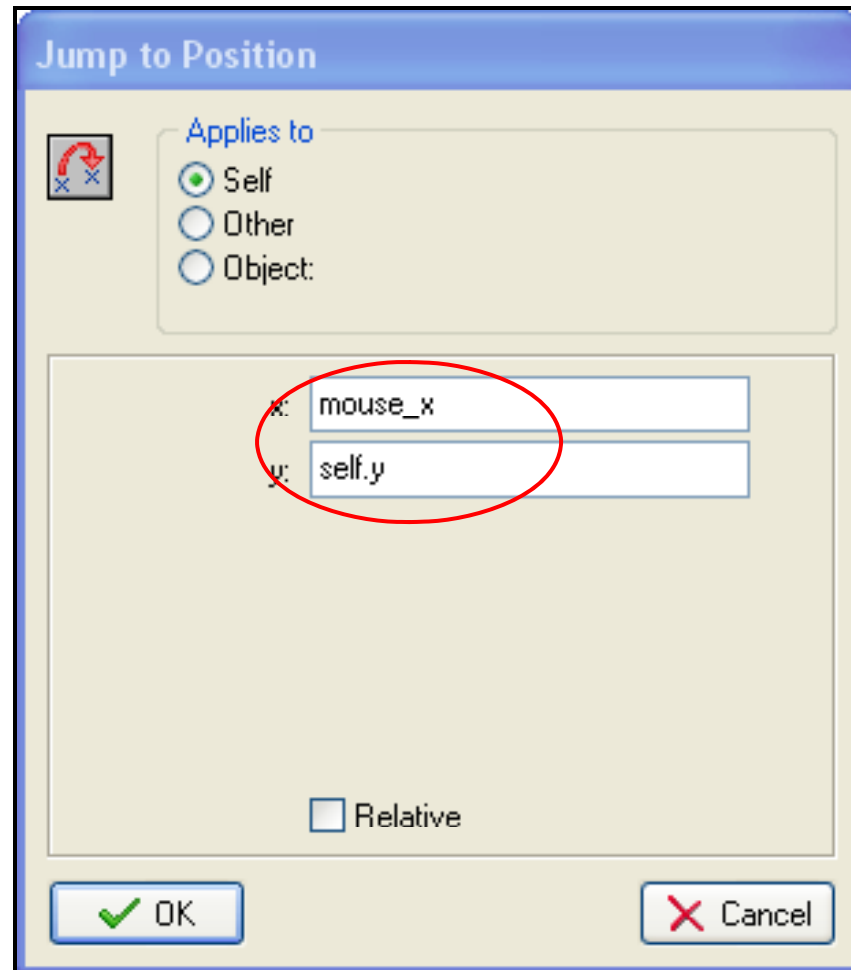
Action	Tab	Action	Tab
Align to Grid	move	Particle Gravity (Pro Edition only)	extra
Bounce	move	Particle Life (Pro Edition only)	extra
Burst From Emitter (Pro Edition only)	extra	Particle Secondary (Pro Edition only)	extra
Call Parent Event	control	Particle Speed (Pro Edition only)	extra
Change Instance	main1	Path Position	move
Change Sprite	main1	Path Speed	move
Check CD (Pro Edition only)	extra	Pause CD (Pro Edition only)	extra
Check CD Playing (Pro Edition only)	extra	Pause Time Line	main2
Check Collision	control	Play CD (Pro Edition only)	extra
Check Empty	control	Play Sound	main1
Check Grid	control	Previous Room	main1
Check Mouse	control	Repeat	control
Check Next	main1	Replace background (Pro Edition only)	main2
Check Object	control	Replace Sound (Pro Edition only)	main2
Check Previous	main1	Replace Sprite (Pro Edition only)	main2
Check Sound	main1	Restart Game	main2
Clear Highscore	score	Restart Room	main1
Clear Pariclet System (Pro Edition only)	extra	Resume CD (Pro Edition only)	extra
Color Sprite (Pro Edition only)	main1	Reverse Horizontal	move
Comment	control	Reverse Vertical	move
Create Effect (Pro Edition only)	draw	Save Game	main2
Create Emitter (Pro Edition only)	extra	Score Caption	score
Create Instance	main1	Set Alarm	main2
Create Moving	main1	Set Color	draw
Create particle (Pro Edition only)	extra	Set Cursor (Pro Edition only)	extra
Create Particle System (Pro Edition only)	extra	Set Font	draw
Create Random	main1	Set Friction	move
Destroy at Position	main1	Set Full Screen	draw
Destroy Emitter (Pro Edition only)	extra	Set Gravity	move
Destroy Instance	main1	Set Health	score
Destroy Particle System (Pro Edition only)	extra	Set Lives	score
Different Room	main1	Set Path	move
Display Message	main2	Set Score	score
Draw Arrow	draw	Set Time Line	main2
Draw Background	draw	Set Variable	control
Draw Ellipse	draw	Show Highscore	score
Draw Health	score	Show Info	main2
Draw Life Images	score	Show Video (Pro Edition only)	main2
Draw Line	draw	Sleep	main2
Draw Lives	score	Speed Horizontal	move
Draw Rectangle	draw	Speed Vertical	move
Draw Scaled Text (Pro Edition only)	draw	Splash Image	main2
Draw Score	score	Splash Settings	main2
Draw Sprite	draw	Splash Text	main2
Draw Text	draw	Splash Video	main2
Draw Variable	control	Splash Webpage	main2
Else	control	Start Block	control
End Block	control	Start Time Line	main2
End Game	main2	Step Avoiding	move
End Path	move	Step Toward	move
End Sound	main1	Stop CD (Pro Edition only)	extra
Execute Code	control	Stop Time Line	main2
Execute Script	control	Stream from Emitter (Pro Edition only)	extra
Exit Event	control	Take Snapshot (Pro Edition only)	draw
Gradient Ellipse (Pro Edition only)	draw	Test Chance	control
Horizontal Gradient (Pro Edition only)	draw	Test Expression	control
Jump Random	move	Test Health	score
Jump to Position	move	Test Instance Count	control
Jump to Start	move	Test Lives	score
Load Game	main2	Test Question	control
Move Fixed	move	Test Score	score
Move Free	move	Test Variable	control
Move to Contact	move	Time Line Position	main2
Move Towards	move	Transform Sprite (Pro Edition only)	main1
Next Room	main1	Vertical Gradient (Pro Edition only)	draw
Particle Color (Pro Edition only)	extra	Wrap Screen	move

Get this sheet at:

<http://cs.oregonstate.edu/~mjb/gamemaker/actions.pdf>

## Action Parameters

Most actions ask you to type in parameters. These parameters can be numbers, or they can be mathematical expressions using symbolic parameters



## Object Properties

<b>x</b>	Instance's current x coordinate
<b>y</b>	Instance's current y coordinate
<b>xstart</b>	where this instance started
<b>ystart</b>	Where this instance started
<b>xprevious</b>	Previous position
<b>yprevious</b>	Previous position
<b>hspeed</b>	X speed in pixels/step
<b>vspeed</b>	Y speed in pixels/step
<b>direction</b>	Current direction in degrees (0-360)
<b>speed</b>	Current speed in pixels/step

Some of the parameters are properties of an object. When you type them in, you will ask for them by typing the object name, a period, and then the property name.

For example:

**Paddle.x**

**Fire.y**

There are some special names for objects. One of the most common is "self", designating the object that triggered this event. You can find out where it is, for example, by typing **self.x** and **self.y**



## Global Names

<b>score</b>	<b>Current score</b>
<b>lives</b>	<b>Current number of lives</b>
<b>health</b>	<b>Current health of the player (0-100)</b>
<b>mouse_x</b>	<b>X position of the mouse</b>
<b>mouse_y</b>	<b>Y position of the mouse</b>

Some of the parameters are global names, that is, they belong to the game as a whole, not to a single object. When you type them in, you will ask for them by typing just the property name. Three of the most common are:

**score**

**mouse\_x**

**mouse\_y**

Note that these are spelled with an underscore not a period. These are names, not objects with properties.



## Define the Wall Object Events



1. **main1→Restart Room** (the transition you choose is up to you)



This is  
the tab







This is  
the event



These are the  
parameters to  
select or type in

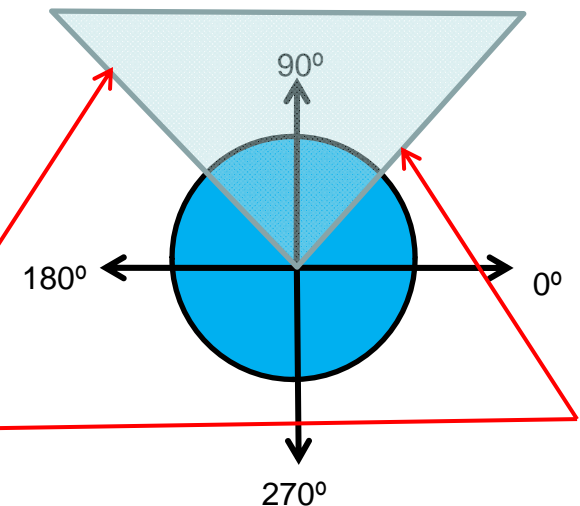
## Define the Bouncer Object's Events

Events:	Actions:
 Create	 Set direction and speed of mol
  Wall	

1. **move**→**Move Free:**  $45 + \text{random}(90)$ , 8

The *random(N)* function returns a random number between 0. and N.

So, the phrase " $45 + \text{random}(90)$ " will give a random number between  $45^\circ$  and  $135^\circ$



## Define the Bouncer Object's Events

The red double-arrows designate a Collision event. The picture to the right of the red arrows shows what you are checking for a collision with.



1. **move**→**Bounce**: Self, not precisely, solid objects
2. **move**→**Speed Horizontal**: Self,  $-2+\text{random}(4)$ , Relative

, " $-2+\text{random}(4)$ " gives you a random number between -2 and +2.

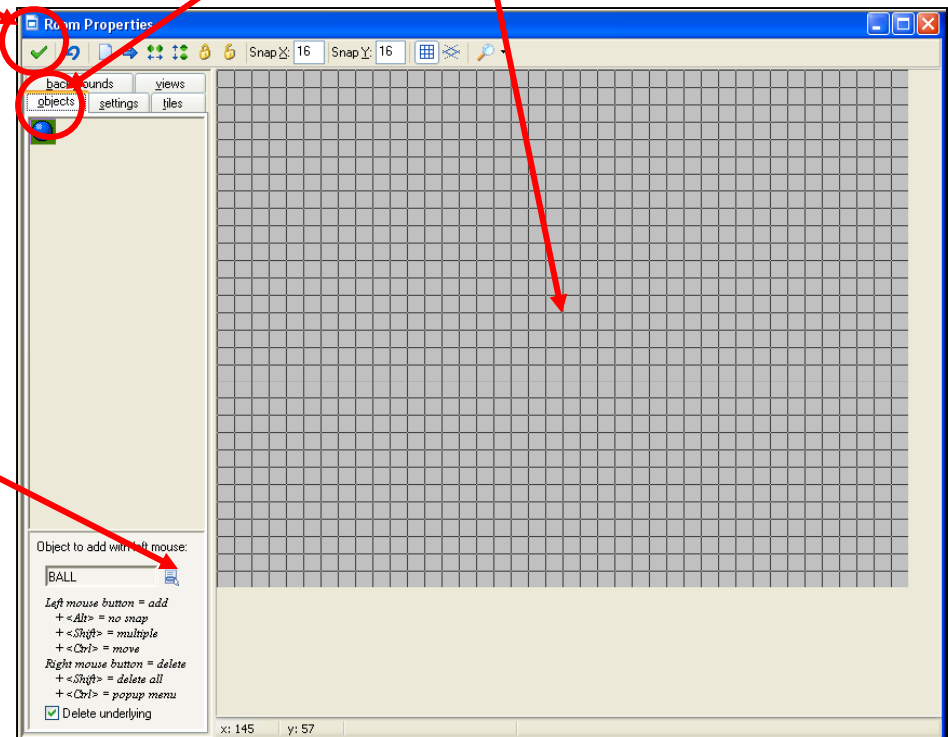
3. **main1** →**Play sound**: **Bounce**

Why is this game randomly altering the fire's speed after a bounce? If you don't, there will likely be times when the fire will end up in a state where it is bouncing back and forth over the exact same path forever and ever. This action alters the fire's speed just enough to prevent that. The trick is to make it big enough to work, but small enough to be unobtrusive.

## Creating a Room

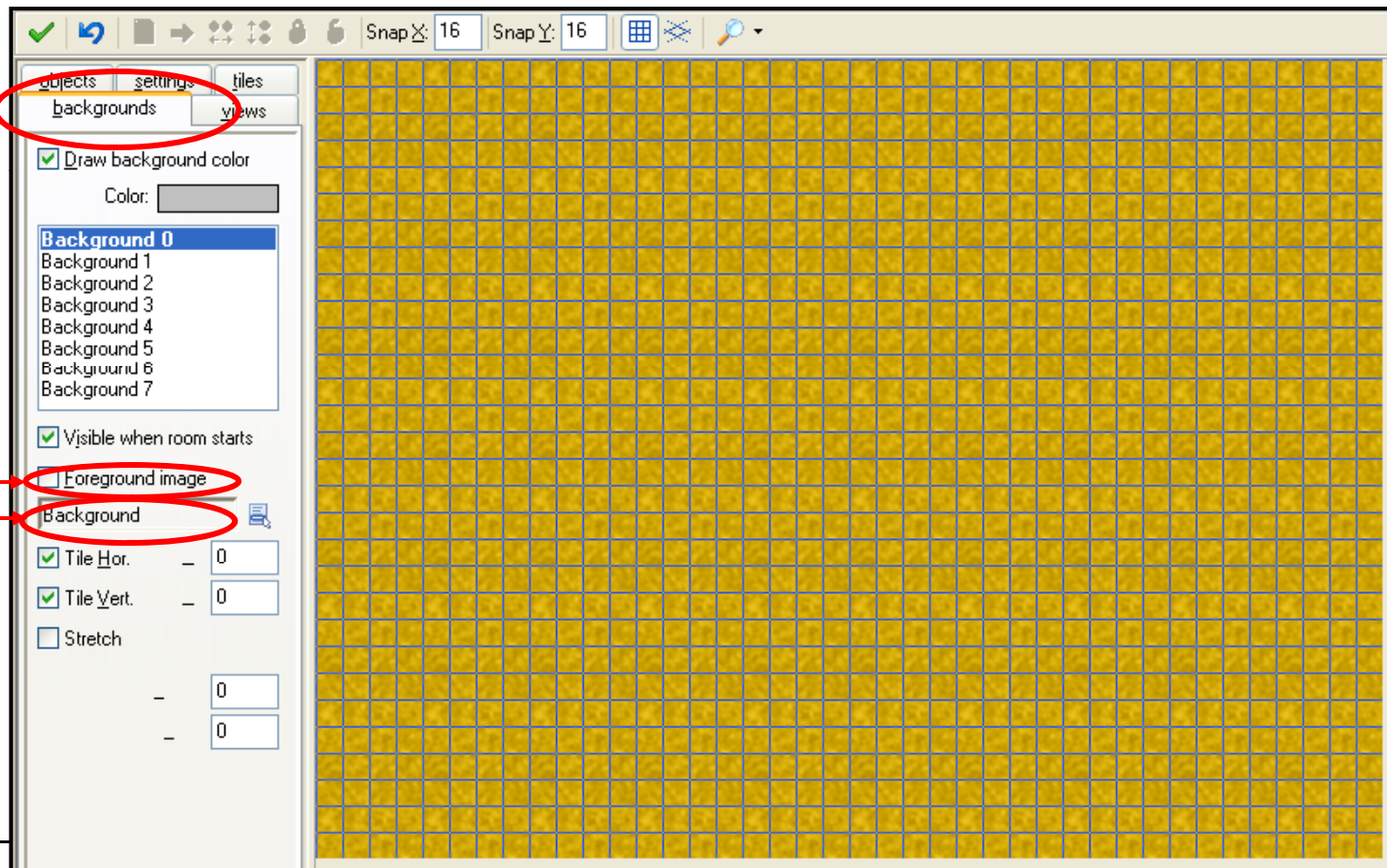
1. Select **Resources**→**Create Room**
2. Click on the **Objects** tab
3. Select an object with the pull-down menu
4. Click in the room to place as many instances of them as you want
5. Click the green checkmark when you are done

Game Maker refers to each of these objects in the room as an ***Instance***.



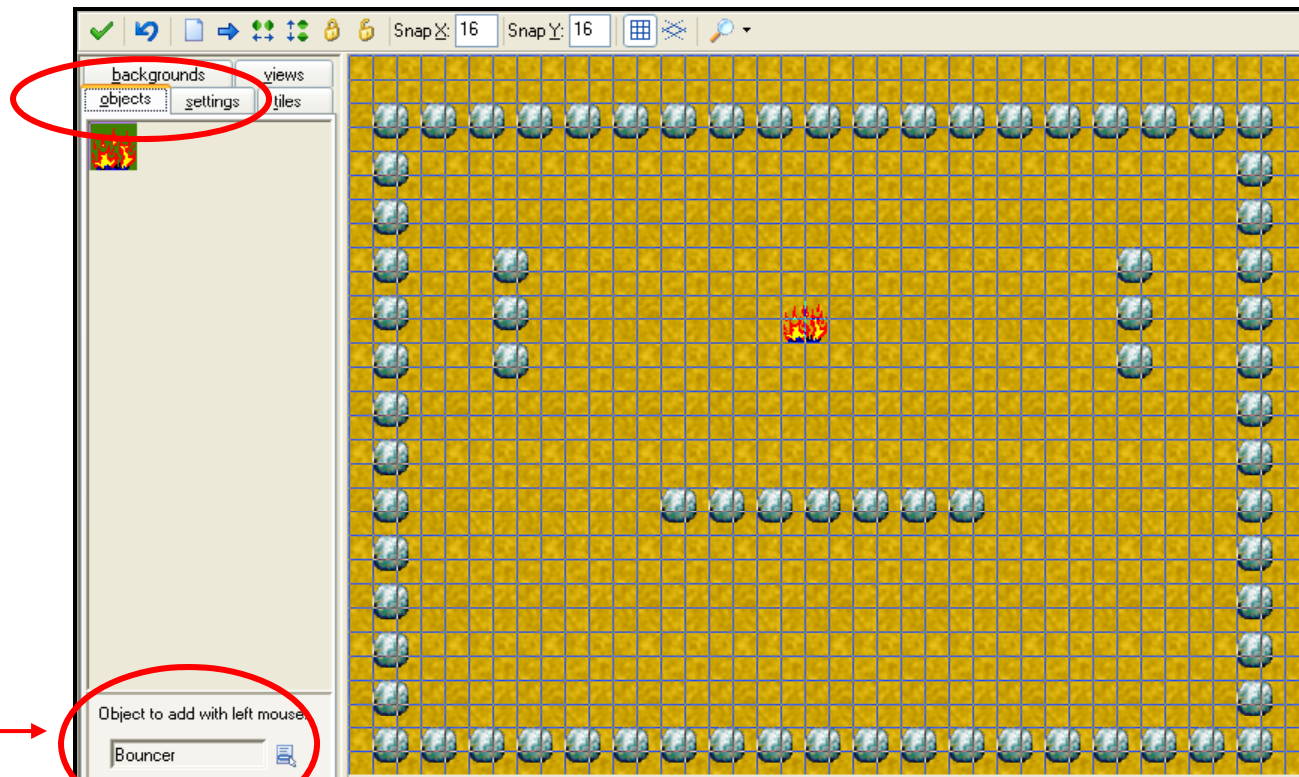
## Define the Room: Resources→Create Room

1. Set the background by clicking the **background** tab
2. Set the background to **Background**
3. Don't make it a foreground image



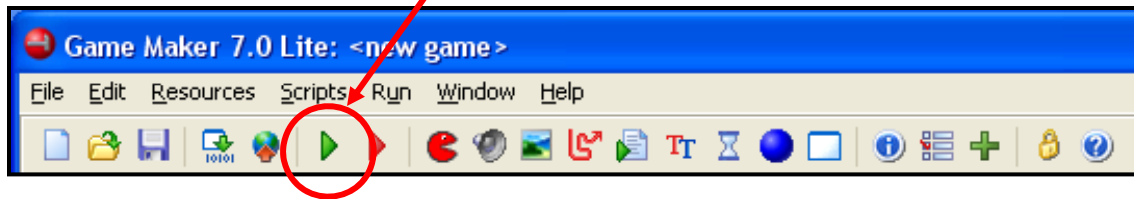
## Define the Room: Resources→Create Room

1. Position the objects by clicking the **objects** tab
2. Select an object from the pop-up menu
3. Left-click as many of them into position as you need
4. Right-click an object to delete it

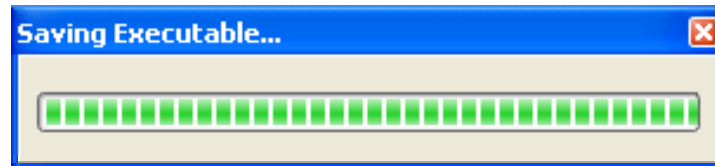


## Running Your Simulation!

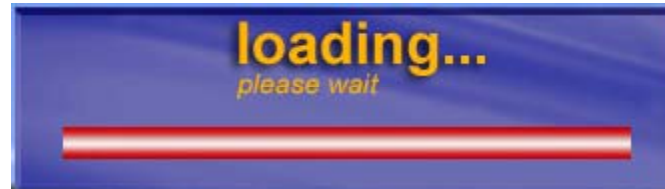
Click on the Green Arrow in the main toolbar



Game Maker will save your executable, which looks like this:

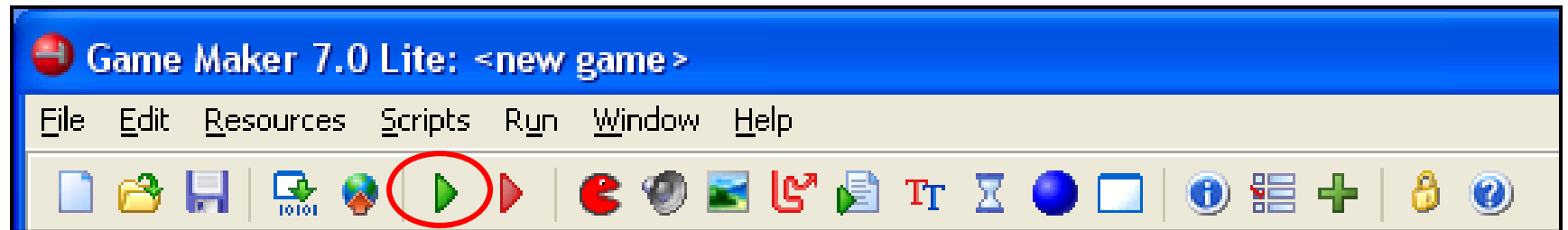


And then load it, which looks like this:



And will then execute it in a new window. Hit the keyboard **Escape key** to stop your program and return to the Game Maker main window.

## Running Your Simulation!



Try arranging the rocks from the wall differently.  
Try setting different values for the starting speed and direction.  
Try using *random( )* in the speed setting.

How does this affect your simulation?