

Using Game Maker 8: A Simulation

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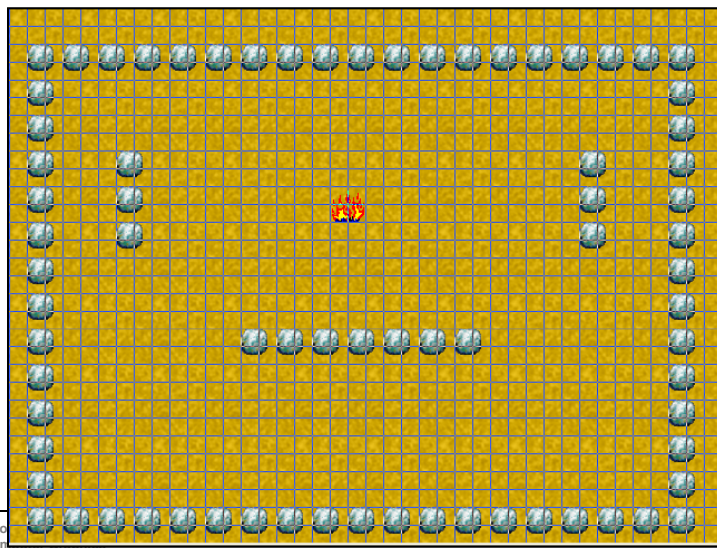


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Let's Start with Just a Simulation

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



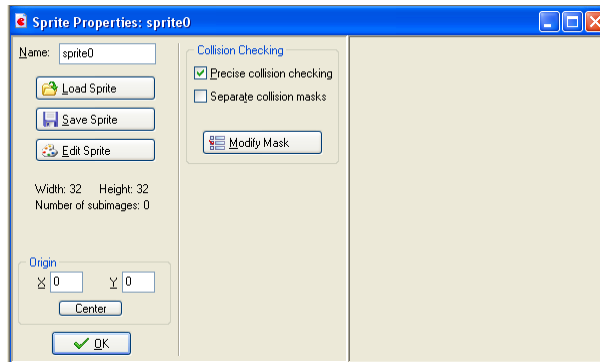
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Creating a Sprite

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.)

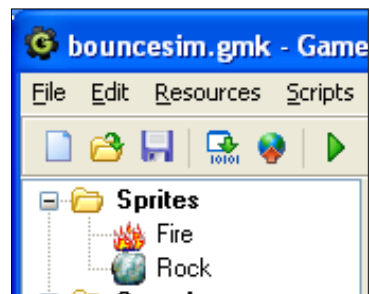


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Define Two Sprites: Resources→Create Sprite

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

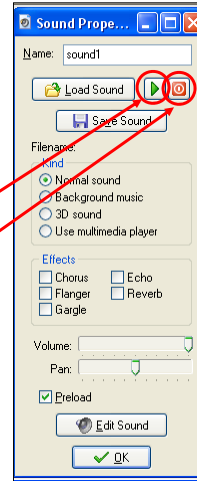


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Creating a Sound

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.



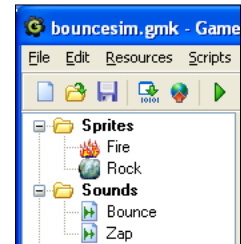
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Define a Bouncing Sound : Resources→Create Sound

Bounce = **Sounds** → **boink2.wav**

Also, while we're at it:



Define the Background: Resources→Create Background

Background = **Backgrounds** → **sand1.gif**

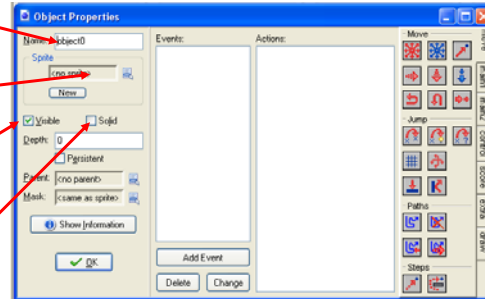


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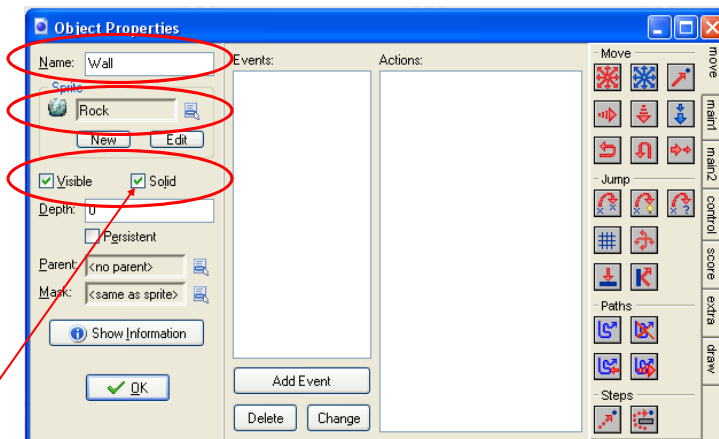
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Creating an Object

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

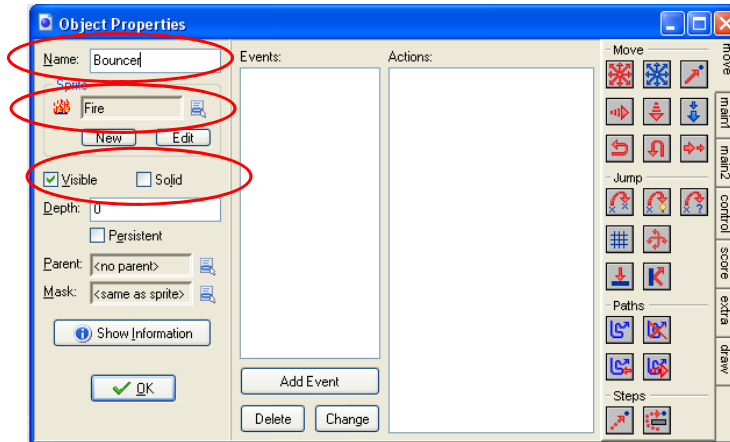


Define the Wall Object: Resources→Create Object



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

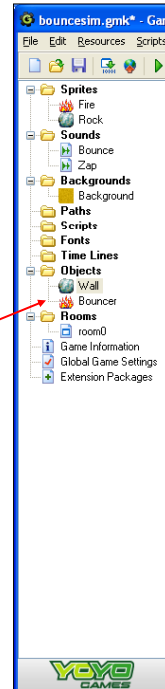
Define the Bouncer Object: Resources→Create Object



Editing something that you've created

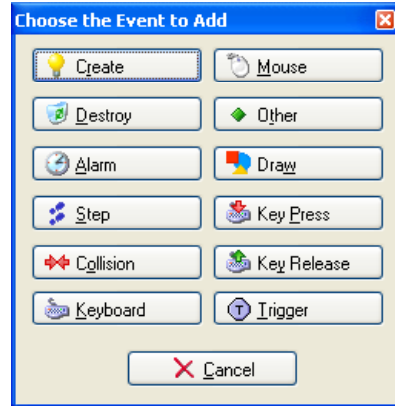
To go back and edit something that you've previously created, double-click on it in this menu area

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

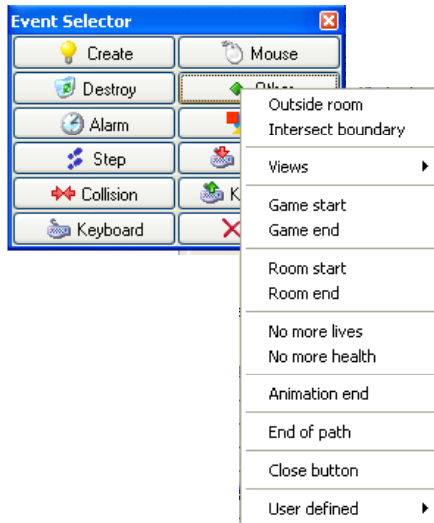
- This menu allows you to select what will trigger this event
- Some of these events will bring up other dialog boxes to let you be more specific. For example, the **Mouse** event button will bring up another dialog box to let you specify what the mouse has to do (buttons, press/release, moving, etc.)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



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The "Other" Event List



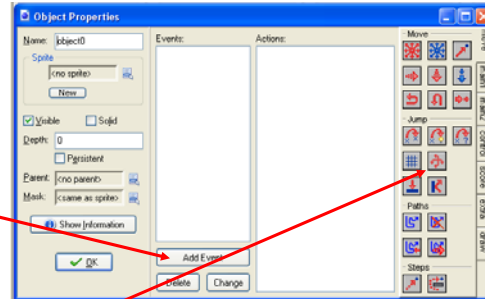
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I'm not sure why these are in a separate list instead of the main Event Selector

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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**.



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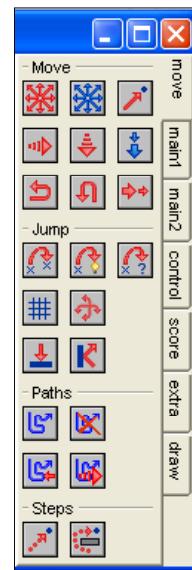
Move Actions

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



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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



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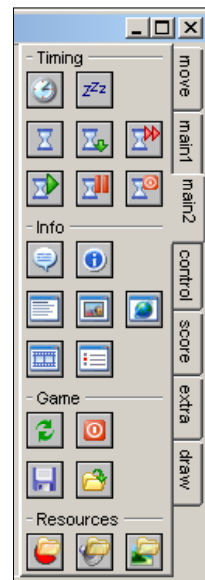
Main2 Actions

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)



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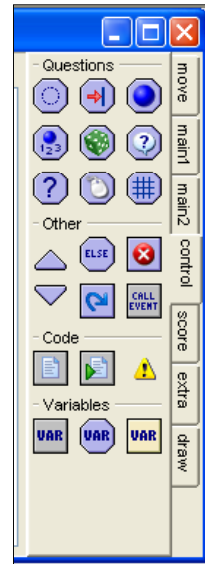
Control Actions

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



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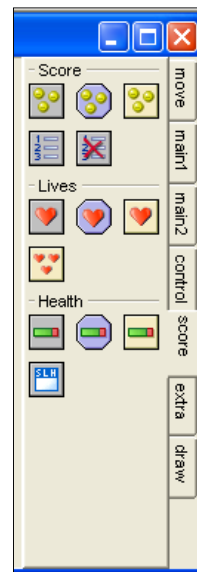
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Score Actions

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



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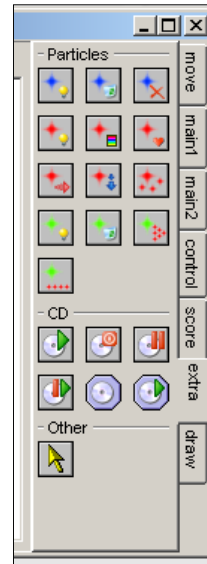
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Extra Actions

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)



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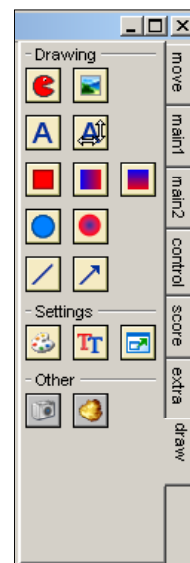
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Draw Actions

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)



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

Action	Tab	Action	Tab
Align to Grid	image	Particle Emitter (Pro Edition only)	entity
Align	image	Particle Size (Pro Edition only)	entity
Align to Layer	image	Particle Secondary (Pro Edition only)	entity
Call Event List	control	Particle Speed (Pro Edition only)	entity
Change Instance	image	Path Find	image
Change Layer	image	Path Speed	image
Check CD (Pro Edition only)	image	Pause CD (Pro Edition only)	entity
Check CD (Pro Edition only)	image	Pause Time Line	entity
Check Collision	control	Play CD (Pro Edition only)	entity
Check Energy	control	Play Sound	entity
Check Grid	control	Process Room	image
Check Movement	control	Repeat	control
Check Next	image	Replace Background (Pro Edition only)	image
Check Object	control	Replace Sound (Pro Edition only)	image
Check Position	image	Replace Sprite (Pro Edition only)	image
Check Sound	image	Reset Layer	image
Clear Background	image	Reset Room	image
Clear Particle System (Pro Edition only)	entity	Reverse CD (Pro Edition only)	entity
Clear Sprite (Pro Edition only)	image	Reverse Horizontal	image
Compare	control	Reverse Vertical	image
Create Effect (Pro Edition only)	image	Save Game	image
Create Layer (Pro Edition only)	image	Score Cap	image
Create Instance	image	Set Alarm	image
Create Particle System (Pro Edition only)	entity	Set Color	image
Create Particle System (Pro Edition only)	entity	Set Cursor (Pro Edition only)	entity
Create Random	image	Set Font	image
Destroy all Instances	image	Set Friction	image
Destroy Layer (Pro Edition only)	image	Set Gravity	image
Destroy Object	image	Set Layer	image
Destroy Particle System (Pro Edition only)	entity	Set Layer	image
Destroy Room	image	Set Layer	image
Destroy Message	image	Set Score	image
Draw Area	image	Set Time Line	image
Draw Background	image	Set Variable	control
Draw Region	image	Show Background	image
Draw Health	image	Show Info	image
Draw Life Messages	image	Show Video (Pro Edition only)	image
Draw Line	image	Stop	image
Draw Lines	image	Speed Horizontal	image
Draw Rectangle	image	Speed Vertical	image
Draw Scrolled Text (Pro Edition only)	image	System Image	image
Draw Score	image	System Settings	image
Draw Sprite	image	System Text	image
Draw Text	image	System Video	image
Draw Variables	control	System Message	image
Fill	control	Start Black	control
Fill Block	control	Start Time Line	image
Fill Layer	image	Stop Layering	image
Fill Path	image	Stop Time Line	image
Fill Sound	image	Stop CD (Pro Edition only)	entity
Execute Code	control	Stop Time Line	image
Execute Script	control	Switch from Layer (Pro Edition only)	entity
Fill Layer	control	Take Instance (Pro Edition only)	image
Horizontal Gradient (Pro Edition only)	image	Test Health	control
Horizontal Gradient (Pro Edition only)	image	Test Instance Count	control
Jump to Position	image	Test Layer	control
Jump to Next	image	Test Position	control
Load Game	image	Test Score	control
Move Area	image	Test Variable	control
Move Layer	image	Time Line Control	image
Move Object	image	Transmute Sprite (Pro Edition only)	image
Move Sprites	image	Vertical Gradient (Pro Edition only)	image
Particle Color (Pro Edition only)	image		

Get this sheet at:

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



Or

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Action Parameters

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

Jump to Position

Applies to

Self

Other

Object:

x:

y:

Relative



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Object Properties

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



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Global Names

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

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

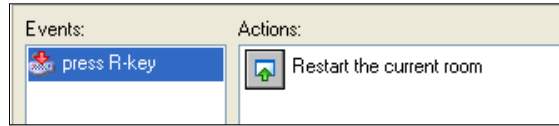
Note that these are spelled with an underscore not a period. These are names, not objects with properties.



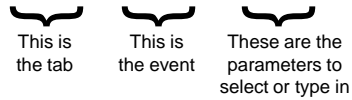
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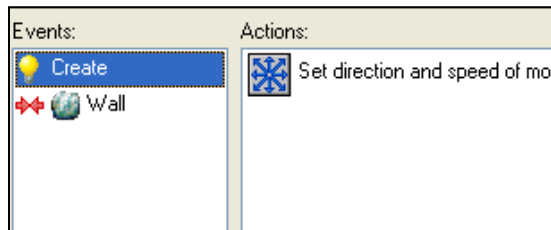
Define the Wall Object Events



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



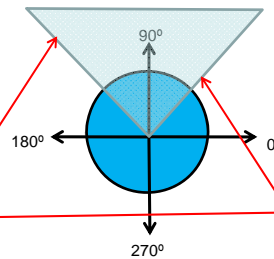
Define the Bouncer Object's Events



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

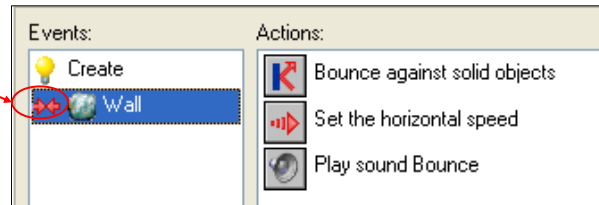
The $\text{random}(N)$ function returns a random number between 0. and N.

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



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.

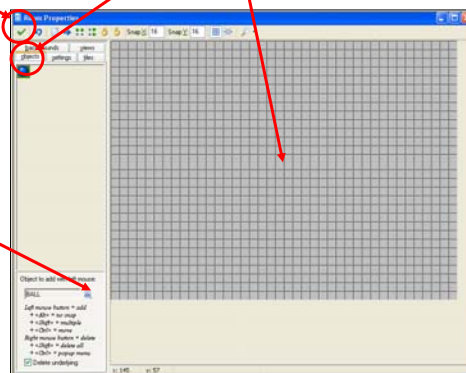
3. **main1** →**Play sound**: **Bounce**

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.

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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

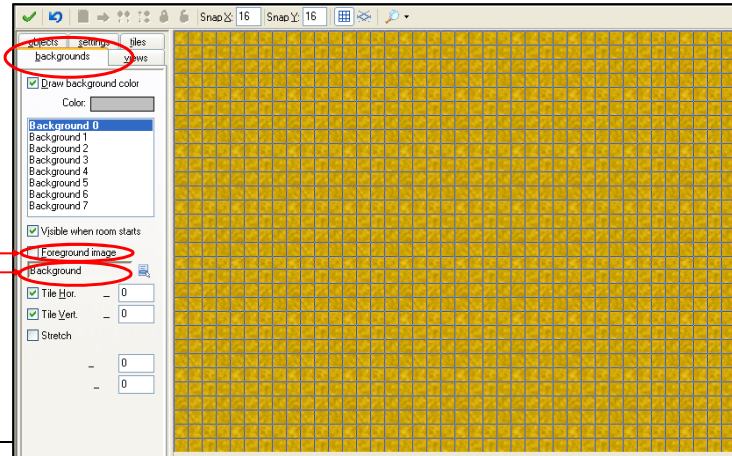


Game Maker refers to each of these objects in the room as an **Instance**.

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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

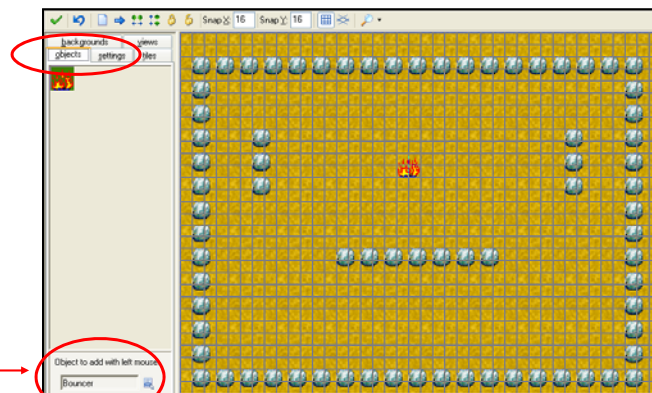


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Define the Room: Resources→Create Room

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



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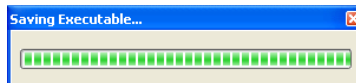
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Running Your Simulation!

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:



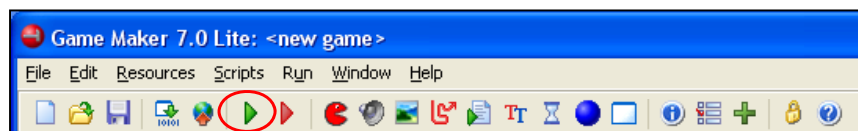
And will then execute it in a new window. Hit the keyboard **Escape key** to stop your program and return to the Game Maker main window.



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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?



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