

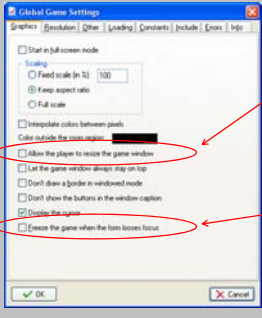
Using Game Maker, II

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

Oregon State University





Setting Global Information about Your Game



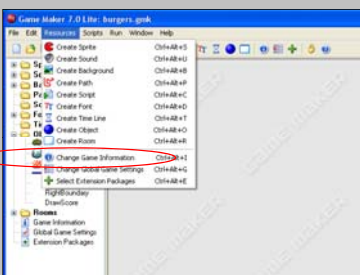
Do you want the player to be able to resize the graphics window?

Do you want the game to keep playing or freeze if you click in another window?




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Setting your Game Information




Double-click on this and enter some information. This will be shown if the player hits the <F1> key while playing your game.



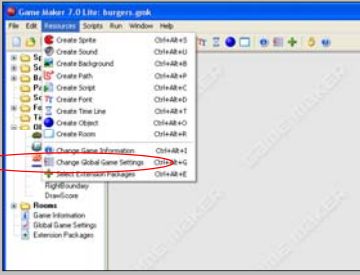
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Setting Global Information about Your Game





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Setting Global Information about Your Game

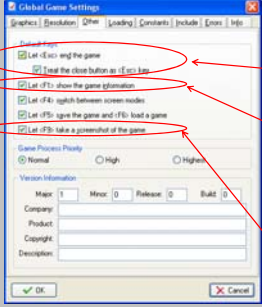


Double-click on this and a tabbed dialog box will pop up. See the next few slides to see what you can do with this.



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Setting Global Information about Your Game



Normally the Escape key terminates the game. However, you can disable this if you want. At times this is useful if you want to force the player to save the game before exiting.

Yes, of course you want <F1> to show your game information.

This feature is *really* handy, so of course you want it enabled! Hitting the <F9> key while playing the game will put an image of the current state of the game in a file called screenshotXXX.bmp, where XXX is 100, 101, 102, etc. The files live in the same folder where your game .gmk file lives.



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Setting Global Information about Your Game

By default, the YoYo Games logo displays during loading. You can change this to something of your own. This image can be one of around 30 different image file types.

You can assign your own game program icon! This image must be in .ico format however. Many image manipulation programs are capable of producing this. Sadly, Photoshop doesn't appear to be one of them.

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Setting Global Information about Your Game

This is more program info. This is not the same as the information that will come up when a player hits the <F1> key.

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Setting Global Information about Your Game

You can pre-define some constants, such as how many of something will be in your game, etc. This is probably more useful when you are writing scripts.

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Running Your Game

Click the **green triangle arrow** in the titlebar

Hit the **Escape** key to exit your game

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Setting Global Information about Your Game

Of course you want to see error messages! If you really care, you can also record them to a file for further examination or printing.

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Running the Game in Debug Mode

Click the **red triangle arrow** in the titlebar

This brings up a new information window

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Running the Game in Debug Mode

Run the game

Pause the game

Take a single animation step

Restart the game

Stop the game

Add an expression to watch

Change the selected watch expression

Delete the selected watch expression

Delete all watch expressions

Expression Value

If you setup "watch expressions", they will display here
(If you want to experiment, try a watch express of: `mouse_x`)

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You can also embed your game in a Web Page

You need to load a YoYo Games Internet Explorer plug-in to make this work

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Running the Game in Debug Mode

Run Watch Tools

Normally, Game Maker tries to run your game at a refresh rate of 30 frames per second ("fps"). You can change that here to slow down the game play. This is useful for debugging, so that you can get a better idea what is going on.

These are useful for debugging, especially if you are using scripts

Debug Information

Run Watch Tools

Set Speed ...

Show Global Variables

Show Local Variables

Show Instances

Show Messages

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Game Creation Basics

From The Game Maker's Apprentice:

- Provide clear, achievable goals
- Give feedback on the player's progress
- Include both short-term and long-term goals
- Add difficulty levels and optional sub-goals for players of different abilities
- Reward the player for achieving goals and sub-goals
- Reward the player randomly
- Give the player choices that make a real difference in the game
- Don't confuse the player with too many controls
- Don't punish the player for things outside of their control
- Avoid unfair setbacks
- Give the player audio feedback about their interactions with the game

And, then one that I've always heard:

- Make the game easy to learn, and hard to master.

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Sharing Your Game with Others

Click File→Create Executable

Game Maker 7.0.1 Help
File Resources Script
New Ctrl+N
Open... Ctrl+O
Recent Files
Save Ctrl+S
Save As...
Create Executable...
Publish your Game...
Merge Game...
Advanced Mode
Preferences...
Exit Alt+F4

This creates a file with a .exe extension. This can be given (email, web page posting, memory stick, etc.) to others.

However, there is the usual warning about running a .exe file sent to you from an untrusted source!!

It's safer to send around .gmk files and read them into Game Maker!

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Game Maker Scripting

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Scripting using the Game Maker Language (GML)

There are two neat things about using GML:

1. It allows your game to do things that the drag-and-drop features can't do by themselves
2. It looks very much like C++ and Java programming!

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Pay Attention to Game Maker's Automatic Color-coding when you Enter a Script – this helps prevent typos

Comment: green
Object name: purple
Property name: blue

If these colors don't come up, then you've spelled something wrong!

Beware: names of things in scripts are all case-sensitive. That is, 'a' ≠ 'A'

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Scripting User Interface

Finish and close this window
Un-do
Cut
Paste
Re-do
Copy
Search for a string
Go to a particular line number
Print the code
Help
Applies To: Object

Replace a string with another string
Check the script for errors

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Implementing a Pause feature with a Script

The exclamation point means "not", i.e., whatever **Paused** is now, change it to the other state.

The **if** statement causes something to happen if **Paused** is true. If it's not, then something **else** happens.

if and **else** statement bodies are delimited with curly braces.

The purpose of this script is to allow the 'p' key to pause the action to let you look at the state of your game. This is nice for development. When pausing, the script records the current fire speed and sets the new fire speed to 0. When un-pausing, the script restores the fire speed to what it used to be.

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The Structure of a Script Action

Scripts begin with a left curly brace {

Comments begin with a // and go to the end of the line

Scripts end with a right curly brace }

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Scripts can be entered as a "Resources → Create Script"

This gives you the chance to name the script, so you can use it in multiple objects

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Scripts can also be entered as an "Execute a Piece of Code" Action

The 'Execute a piece of code' dialog box shows a list of actions including 'Execute a piece of code'. Below it, the 'Execute Code' window contains the following script:

```

globalvar Paused: // starts out as false
globalvar Speed:

Paused = ! Paused: // toggle the value of Paused false <-> true
// turns to true on the first 'p' press

if( Paused )
{
    Speed = Fire.speed: // remember the existing speed
    Fire.speed = 0.: // set the current speed to 0
}
else
{
    Fire.speed = Speed: // restore the previous speed
}
    
```

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Define the Paddle Object's Events

The 'Object Properties' dialog box for the Paddle object shows the 'Events' tab with a 'Click Left Button' event. The 'Actions' list includes 'Execute a piece of code'. Below it, the 'Execute Code' window contains the following script:

```

if( self.x < LeftBoundary.x )
    self.x = LeftBoundary.x:

if( self.x > RightBoundary.x )
    self.x = RightBoundary.x:
    
```

1. control-->Execute Code

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Define the Fire Object's Events

The 'Object Properties' dialog box for the Fire object shows the 'Events' tab with a 'press P-key' event. Below it, the 'Execute Code' window contains the following script:

```

globalvar Paused: // starts out as false
globalvar Speed:

Paused = ! Paused: // toggle the value of Paused false <-> true
// turns to true on the first 'p' press

if( Paused )
{
    Speed = Fire.speed: // remember the existing speed
    Fire.speed = 0.: // set the current speed to 0
}
else
{
    Fire.speed = Speed: // restore the previous speed
}
    
```

1. control-->Execute Code

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General Information

- Game Maker scripts look very much like programming in C, C++, and Java
- Scripts must begin with a left curly brace ({) and end with a right curly brace (})
- Statements end with a semi-colon (;)
- Variable names consist of letters, numbers, and the underscore (_)
- Variable names must begin with a letter
- Letters are case-sensitive, that is 'A' ≠ 'a'

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Limiting Motion with a Script

The 'Execute Code' window contains the following script:

```

if( self.x < LeftBoundary.x )
    self.x = LeftBoundary.x:

if( self.x > RightBoundary.x )
    self.x = RightBoundary.x:
    
```

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Functions you can use in Game Maker Scripts

abs(f)	Absolute value of a number
arccos(c)	Arc whose cosine is c
arcsin(s)	Arc whose sine is s
arctan(y_over_x)	Arc whose tangent is y_over_x
arctan2(y,x)	Arc whose tangent is y/x, taking signs into account
ceil(f)	Next highest whole number
cos(f)	Cosine of f
degtoRad(d)	Turn d into radians
exp(f)	e (2.71828...) raised to the f power
floor(f)	Next lowest whole number
Frac(f)	Fractional (non-whole number) part of f
ln(f)	Log to the base e (2.71828...) of f
log2(f)	Log to the base 2 of f
log10(f)	Log to the base 10 of f
radtoDeg(r)	Turn r into degrees
random(f)	A random number between 0. and f
round(f)	Round f to the nearest whole number
sign(f)	The sign of f (-1, or +1)
sin(r)	The sin of r
sqr(f)	The square of f
sqrt(f)	The square root of f
tan(r)	The tangent of r

... and lots more ...

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General Information

- You can create conditional execution with an 'if-else' block

```

if( Paused )
{
    Speed = FireSpeed; // remember the existing speed
    FireSpeed = 0; // set the current speed to 0
}
else
{
    FireSpeed = Speed; // restore the previous speed
}
    
```

- You can create a loop with a 'for' block

```

did_primitive_begin( pr_11sectip );
for( angle = 0; angle <= 180; angle += 10. )
{
    radians = DegreesToRadians * angle;
    x = R * cos(radians);
    z = R * sin(radians);
    y = 0 + angles;
    did_vertex( x, y, z );
}
    
```

" for(initial-settings ; keep-going-if-this-is-true ; do-this-in-between-loops) "

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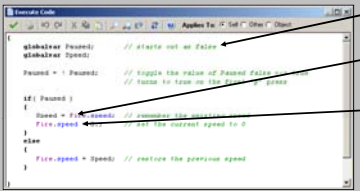
"Burn-Me" – the Game



The idea is that fires come at the burger. He needs to either hit them or avoid them, depending on how you want the game play to work.

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Note Game Maker's Automatic Color-coding when you Enter a Script – this helps prevent typos



- Comments begin with "//" and are green
- Object names are purple
- Property names are blue
- Special constants are red
- Special variables are blue


If these colors don't come up, then you've spelled something wrong!

Beware: names of things in scripts are all case-sensitive. That is, 'a' ≠ 'A'!

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Define the Sprites: Resources→Create Sprite

- burger = Sprites → various → Burger.ico
- fire = Sprites → various → Fire.ico



Define the Sounds : Resources→Create Sound

- zap = Sounds → zap.wav


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Another Type of Game: A Comes-At-You Game Example

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Define the Background: Resources→Create Background

- Background = Backgrounds → stars.gif



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Try Editing the Background Image

Call it "background"

Background Properties

Name: background

Width: 96 Height: 96

Transparent

Edit Background

Smooth edges

Preload texture

Use as tile set

OK

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Setup the Burger and Fire Objects (Leave the Events and Actions for Later)

Set the appropriate sprite

Object Properties

Name: Burger

Sprite: Burger

Visible Solid

Depth: 0

Event: Placement

Mask: (same as sprite)

Show Information

OK

Both need to be Visible and Solid

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Try Editing the Background Image

This is the background-editing window

Image Editor

Click on the magnifying glasses to zoom in or out

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Setup the Burger Object's Events and Actions

Object Properties

Name: Burger

Sprite: Burger

Visible: Solid:

Events:

- Fast:
 - Play sound zap
 - Set the score relative to 1
 - Jump to a given position

Actions:

OK

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Try Editing the Background Image

Use the eyedropper tool to select a color in the image

Use the drawing or spray painting tool to draw in the image

Image Editor

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Setup the Burger Object's Events and Actions

Collision with Fire

- main1→Play Sound: zap, no looping
- score→Set Score: 1, relative
- move→Jump to Position: Other, random(room_width), -5

Global Left Button

- move →Jump to Position: Self, mouse_x, self.y

Press <Left>

- move →Jump to Position: Self, -10, 0, Relative

Press <Right>

- move→Jump to Position: Self, 10, 0, Relative

Press R key

- main1→Restart Room: Fade out and in

-y
↓
+y

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Setup the Fire Object's Events and Actions

Object Properties

Name: Fire

Spills: [New] [OK]

Visible: Solid:

Depth: 0

Parent: [None]

Event: [no parent]

Mask: [same as spill]

Show Information

Events:

- Game Start

Actions:

- Jump to a given position
- Start moving in a direction

Buttons: Add Event, Delete, Change

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Run the Game

Score: 38

Do you like it better when you try to hit the fires or avoid them? Why?

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Setup the Fire Object's Events and Actions

Outside Room

1. move→Jump to Position: Self, random(room_width), -5
2. move→Move Fixed: Self, Down arrow, 2

Game Start

1. score→Set Score: 0
2. move→Move Fixed: Self, Down arrow, 2

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An Interesting Variation

In the Fire Events, Change:

Outside Room

1. move→Jump to Position: Self, random(room_width), -5
2. move→Move Fixed: Self, Down arrow, 2

To:

Outside Room

1. move→Jump to Position: Self, random(room_width), -5
2. move→Move Free: Self, 225+random(90), 2

What will this do???

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Setup the Room

Be sure to make the window big enough to see the entire room.

Put in one burger and lots of fires!

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Try Making the Background Move with the Fires

Room Properties

Backgrounds

Draw background color

Color: []

Background 1

Background 2

Background 3

Background 4

Background 5

Background 6

Background 7

Visible when room starts

Background image

Tile type: []

Tile set: []

Stretch

Vertical Speed: 2

Horizontal Speed: 2

Set the background's Vertical Speed to 2 (down), same as the fires!

This now makes it look like the burger is flying through space, instead of the burger being stationary and having fires attack it.

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Good Game Maker Web Links

General Game Maker Site:

<http://www.yoyogames.com>

These (and other) notes:

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

276-page PDF Game Maker documentation:

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



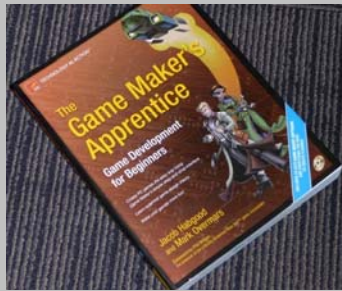
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Reference Book

Jacob Habgood and Mark Overmars, *The Game Maker's Apprentice*, Apress, 2006.

(\$27 on Amazon)



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