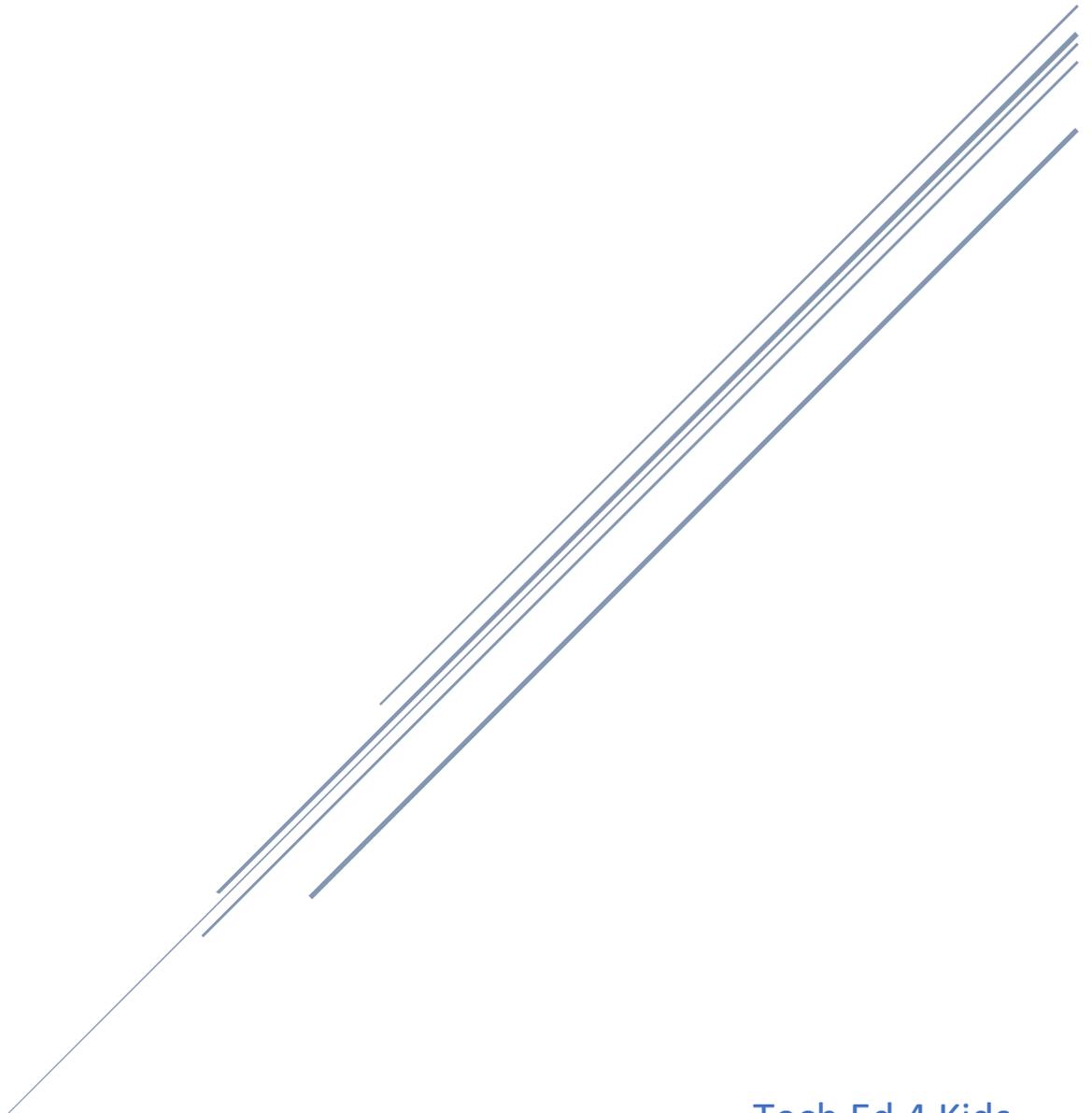


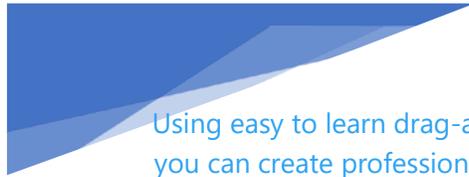
# BREAKOUT

<https://teched4kids.com>



Tech Ed 4 Kids  
Creating Your Own Game

For middle school kids designing their own computer game is a great way to not only have a great time but also learn something. To get started we need to install [YoYo GameMaker](#). There are version for Windows and Mac available for free.

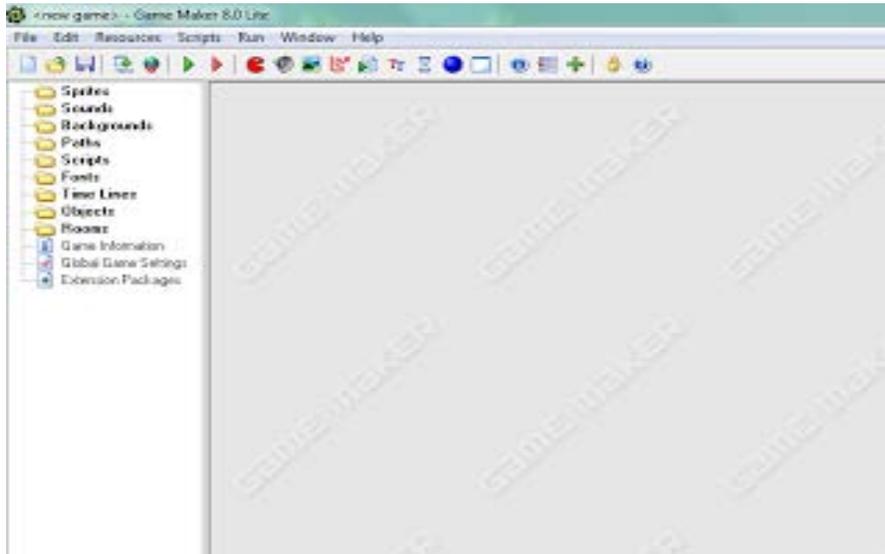


Using easy to learn drag-and-drop actions, you can create professional looking games within very little time. You can make games with backgrounds, animated graphics, music and sound effects, and even 3D games! And when you've become more experienced, there is a built-in programming language, which gives you the full flexibility of creating games with Game Maker. What is best, is the fact that Game Maker can be used free of charge. You can do anything you want with the games you produce, you can even sell them! Also, if you register your copy of Game Maker, you can unlock extra functions, which extend the capabilities of the program. Game Maker comes preloaded with a collection of freeware images and sounds to get you started.

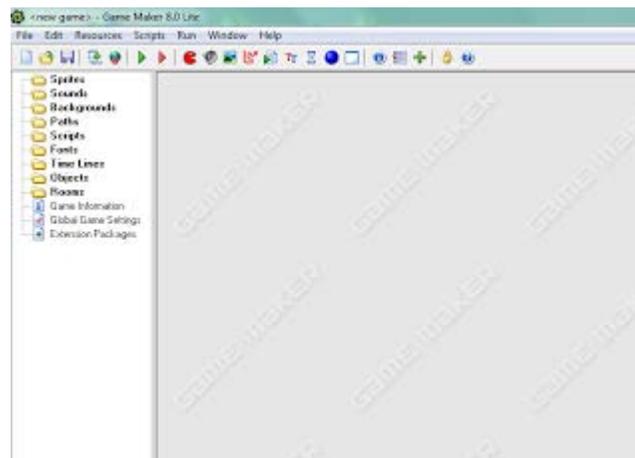
YoYo GameMaker

Registering YoYo GameMaker will get more features, but the lite version will do everything we need for our current project. The full version is a great investment though and it is also worth it to support YoYo Games. We have two copies of the full version software here. Tomorrow we will start designing our game. – There is a new version available (this is 8.1 which is older). The new version is \$99 for the full version and also has a trial, you can find the 8.1 version available for download.

# Sprite Creation



When you start up Game Maker 8.1 you will see a screen like:



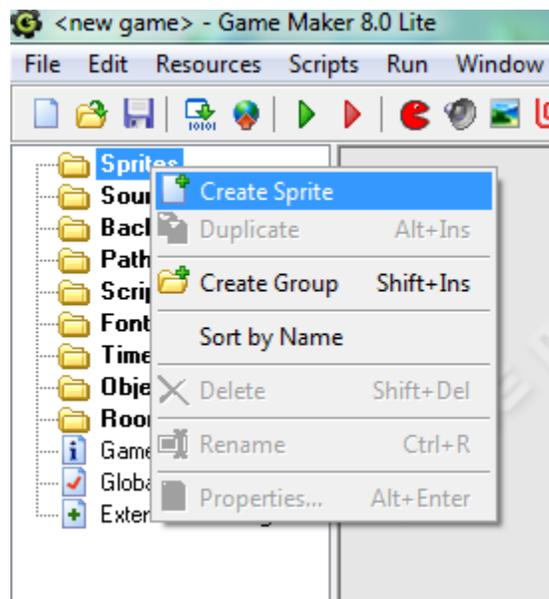
We now need to add 4 sprites (graphics) for our game.

For Breakout we will need:

1. Bat
2. Ball

3. Barrier
4. Wall

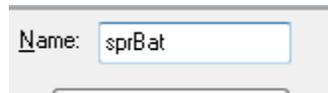
1. These will be added as objects in the next lesson and then added to the 'room' after. There are several preloaded graphics included with the lite version of Game Maker that we can use. They include some balls, a few bat options, lots of barriers, and a wall graphic. To add a sprite the first step is to right click on Sprites on the left and choose Create Sprite.



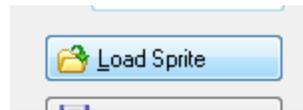
Two things need defined for each sprite. The Name and a graphic. In this case we are going to name each item with a name that starts with spr (Following a naming convention) So we will have:

1. sprBall
2. sprWall
3. sprBarrier
4. sprBat

Defining the Name:



Next use the Load Sprite button to add a graphic to the Sprite definition. – In this case we are going to choose a Bat graphic.



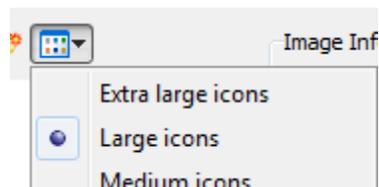
While choosing a graphic for the sprite you can use the up folder button to move up a folder and double click on the folders to open a folder and move back down.



If you don't see the graphics (only the names) the icon:

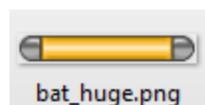


will let you change the settings so that you can see the graphics.



The ball and bat are within the folder 'Bouncing Balls', Wall is within the 'Tutorial1' folder, and the Barriers are within the 'Bouncing Balls/Stones' Folders. Associate a graphic with the sprite and choose OK.

One possible bat:



Go on to create the four sprites needed:



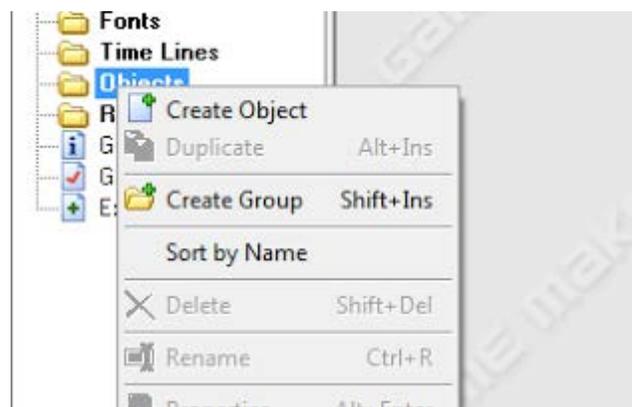
## Object Creation



The object will later be associated with actions. Like making the ball start moving.



We will now right click on Objects and choose Create Object.



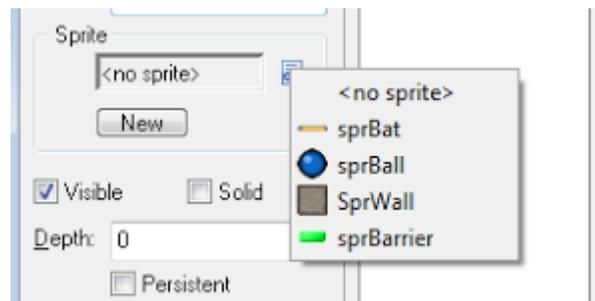
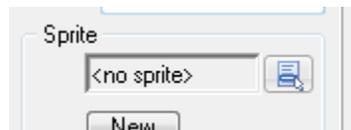
We will need to create four objects:

1. ObjBall
2. ObjBat
3. ObjWall
4. ObjBarrier

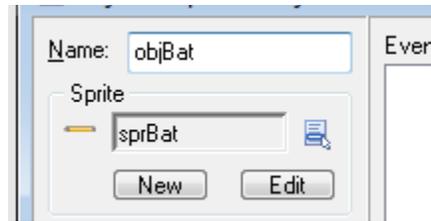
To stick with naming conventions we are naming each object with a name that starts with Obj.



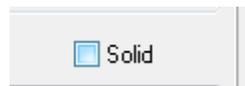
After entering a name we need to associate a Sprite with the Object. So for the objBat object we will choose the sprBat sprite to go with.



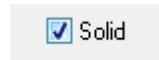
After the sprite is associated you will see the name and graphic.....



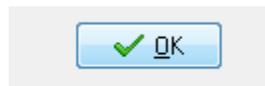
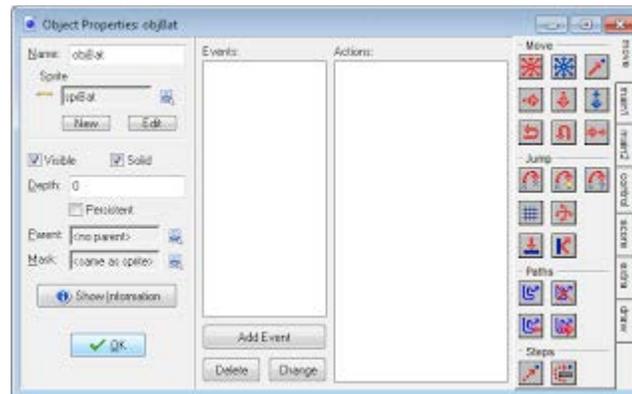
We also want these objects to all be solid objects so that they will not pass through each other. (Ball won't pass through the Bat and so on...) So choose the Solid checkbox.



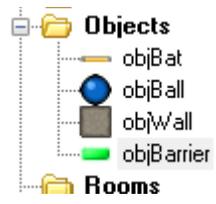
Checked:



Once the name, sprite, and Solid are taken care of Choose OK.



and go on to create the additional three objects:

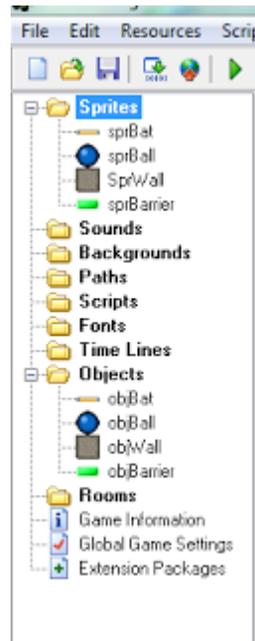


After all four objects are created you will see the above Objects in your directory.

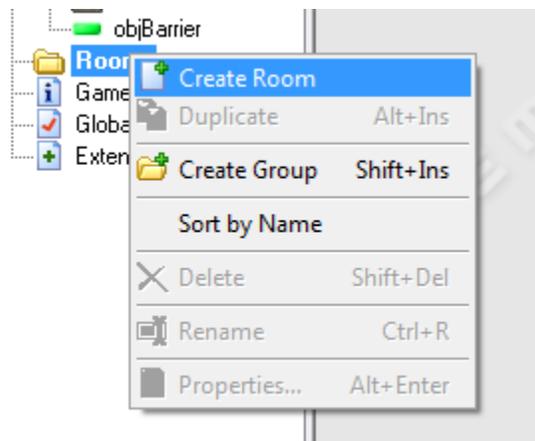
# Designing our Room



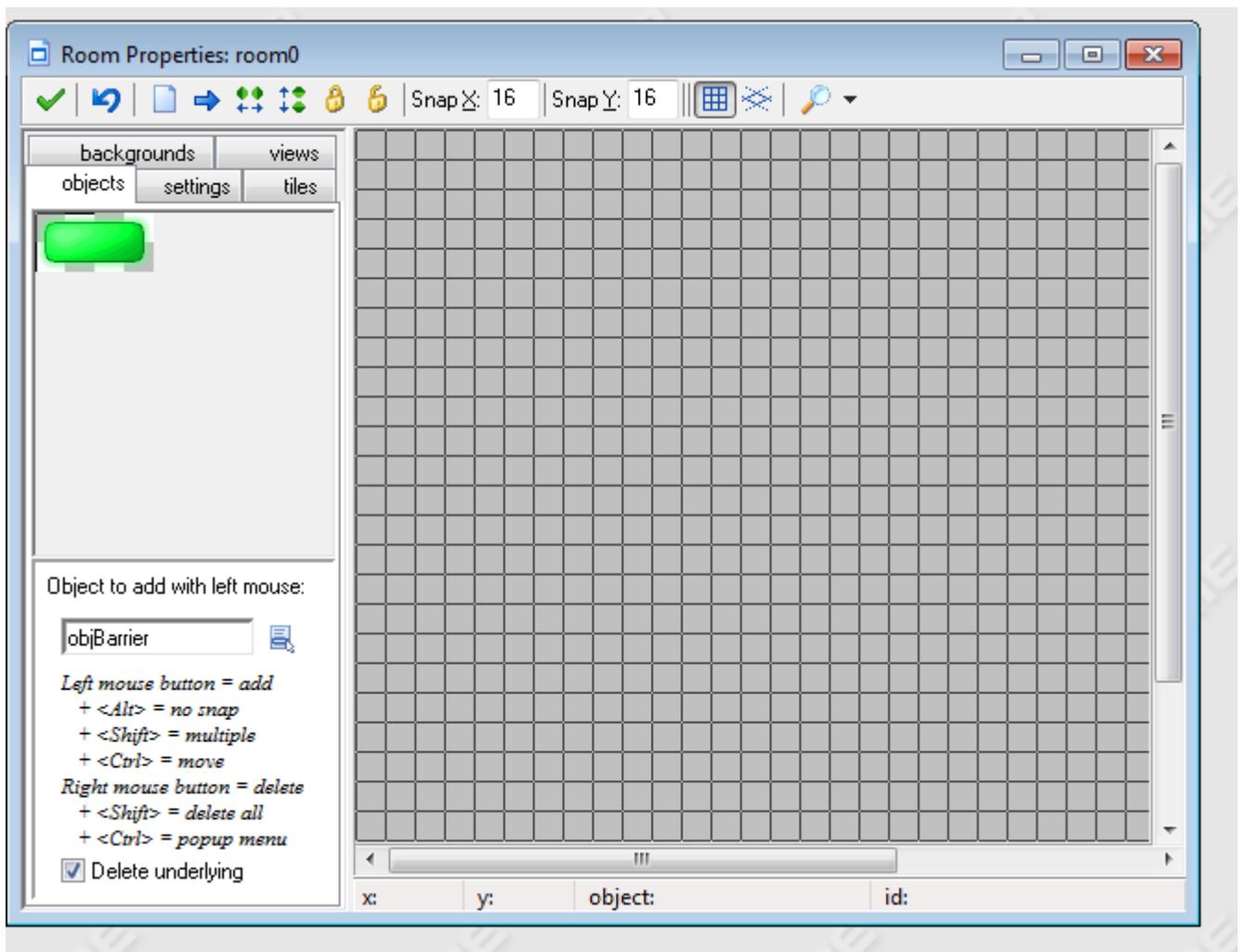
If there is a plus beside Sprites or Objects you can click on it to expand the category and see each item.



We now will right click on the Rooms folder on the left, and choose Create Room. this will create our room to lay out our objects within.



The room window should look like the following:



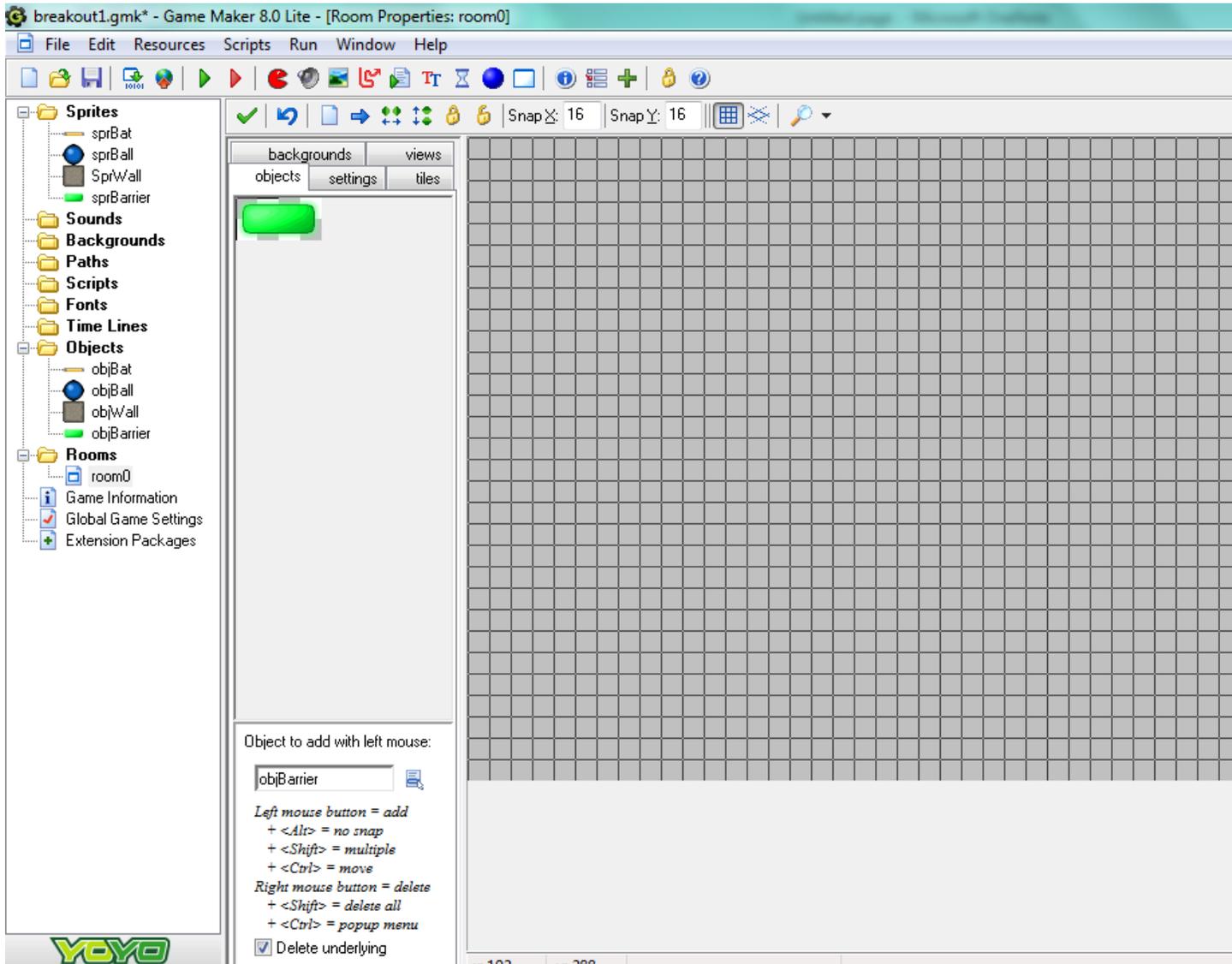
Up in the top right corner you see:



Click on the



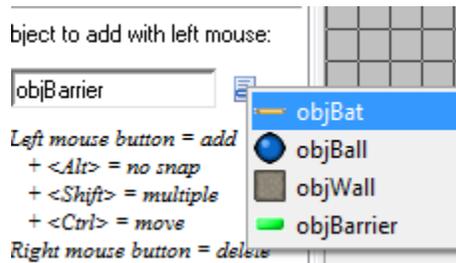
to expand the window to take up the entire window.



You can now add objects to the window by choosing the objects in the objects section and then left clicking in the room grid where you would like them to go. (Right click takes them away)



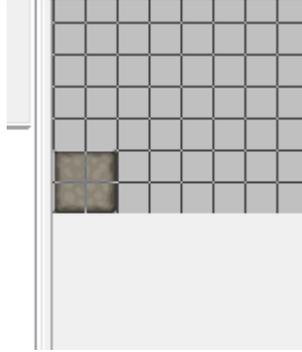
Which object you are placing can be changed down near the bottom of this section with the selection icon like shown:



You will need to choose each object and place them.



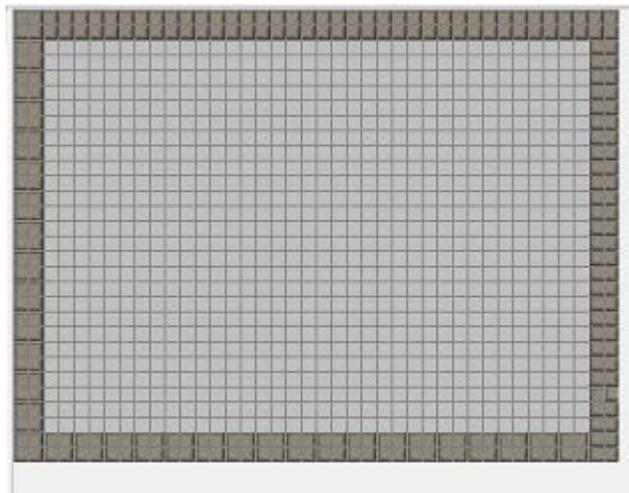
For the Wall you will place them around the edges of the window.



You can use some 'cheat' keys to simplify it. For Example holding down the shift button while holding and dragging using the left mouse button will place multiple objects.

```
Left mouse button = add
+ <Alt> = no snap
+ <Shift> = multiple
+ <Ctrl> = move
Right mouse button = delete
+ <Shift> = delete all
+ <Ctrl> = popup menu
 Delete underlying
```

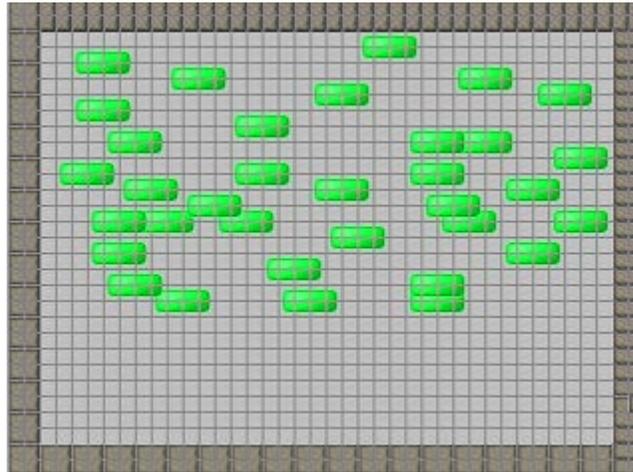
Walls should be placed around the edges of the room.



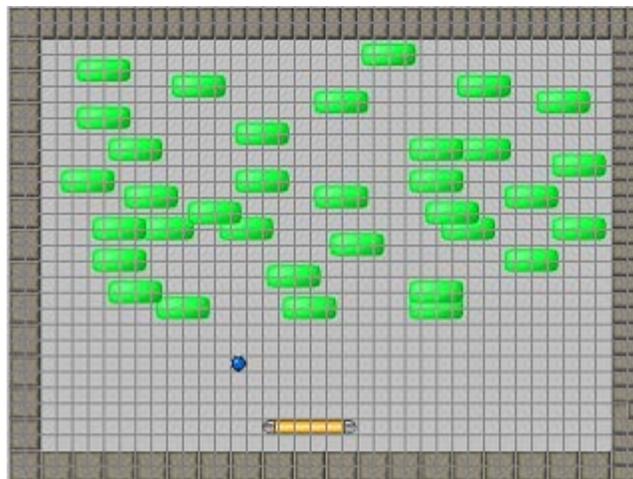
Next we need to place Barriers. We will place 50 of these. For scoring it's best to start with a predefined number.

objBarrier 

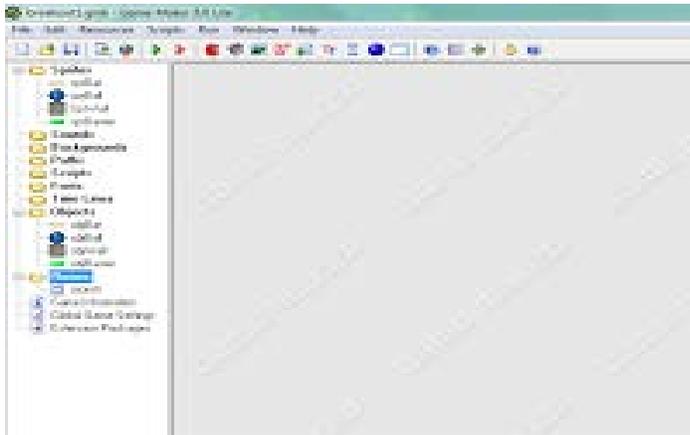
these can be randomly placed throughout the screen:



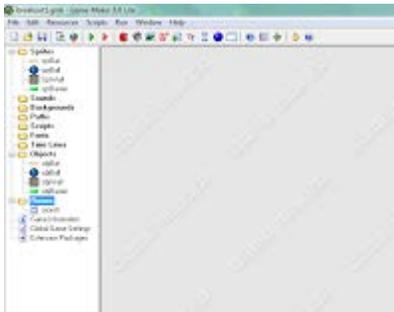
We will also place the Ball and the Bat.... defining a screen like below.



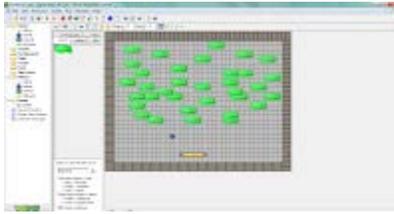
# Add Actions for Our Bat



Now we get to start adding actions to our objects. Yeah! You should currently have Sprites, Objects, and your Room set up. Our objective is to move the bat left and right with the left and right arrow keys.

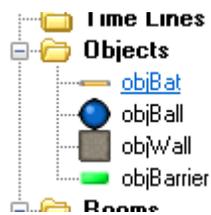


Set up from Part 4

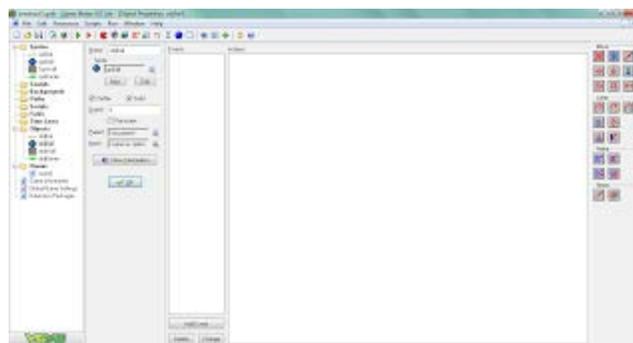


Room from Part 4

You can view the Room from part 4 by double clicking on the room and displaying it on the screen. We are going to set up actions for our Bat. If your objects aren't expanded, click the plus to the left of objects.



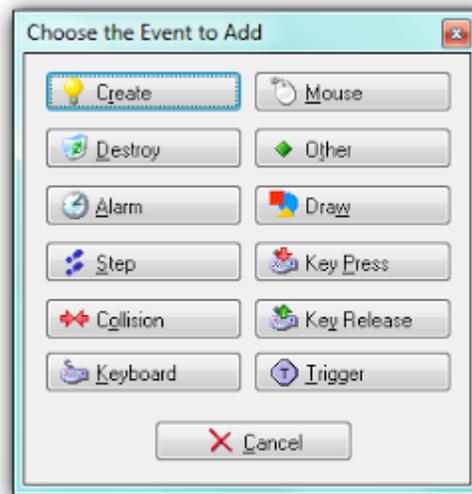
When we double click on objBat we will see the object properties for the Bat. To the left is the basic properties, Middle is the key action we are working with, and the right are actions that we can assign to those keys.



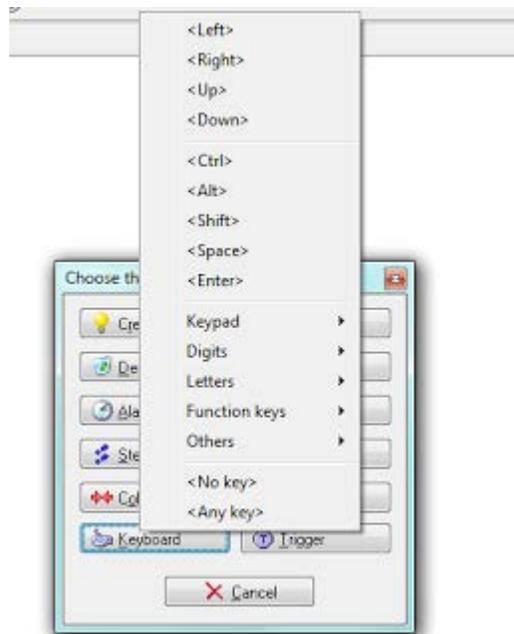
We will start by adding an event to the left arrow key. Click on Add Event at the bottom of the middle section.



This will bring up a menu to choose the event to add. (What key press will trigger the action)



For this we want to choose Keyboard-Left.



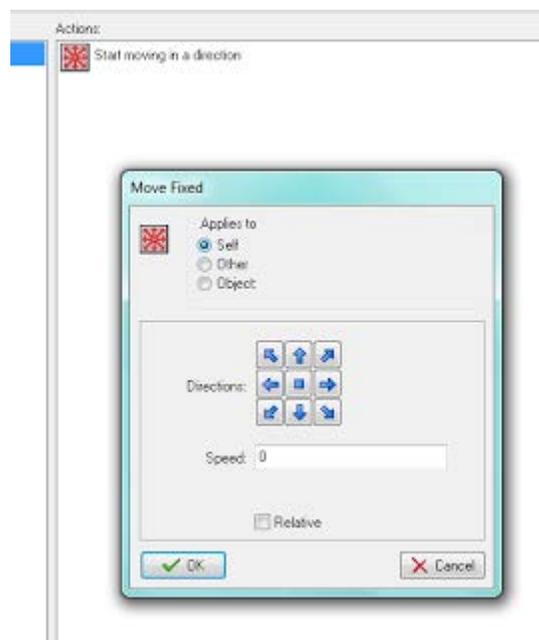


The keyboard left will be added to the middle section. This is the left arrow key on your keyboard.

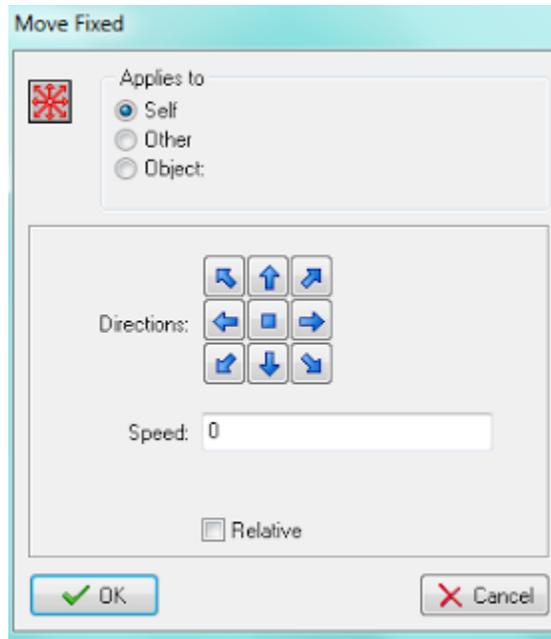


We then have to add an action using the move fixed. This is the top left icon. It will start an object moving in a defined direction. To add the action to the trigger, left click on the icon and drag it to the actions section of the screen.

The menu to define properties for Move Fixed will then be displayed.



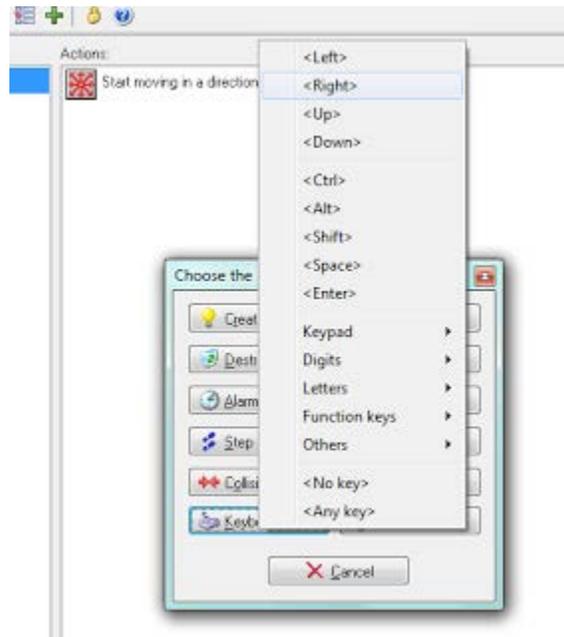
We will leave set to Apply to Self. We need to set a direction to move and a speed. In this case our object needs to move left. So we will choose the left arrow.



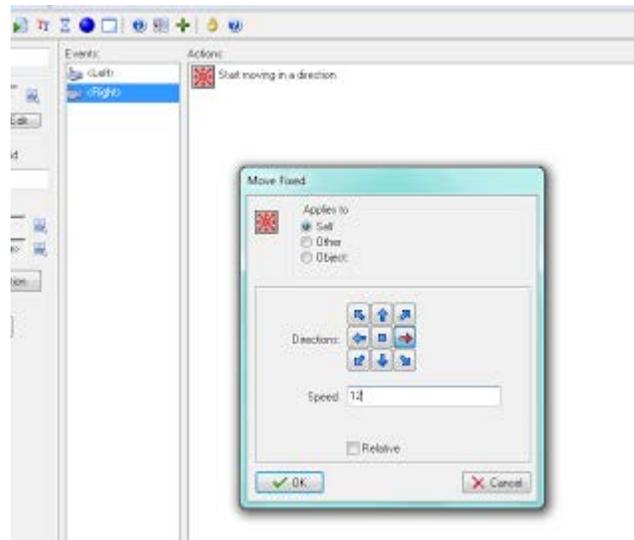
Set the left direction. Then set the speed. I'm choosing 12 in the example.



We will then need to set an action for the keyboard right also.



We will set the actions the same, but will choose to move right instead of left when setting the arrow actions.



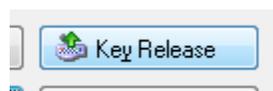
After setting the Keyboard left and right give your programming a test run. To run your program choose the green arrow in the toolbar at the top:



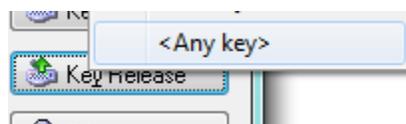
Try moving the bat left and right to see what happens.

Did the Bat stop? If not we need to add an action to stop the bat...

For this we'll add an event: Key Release.



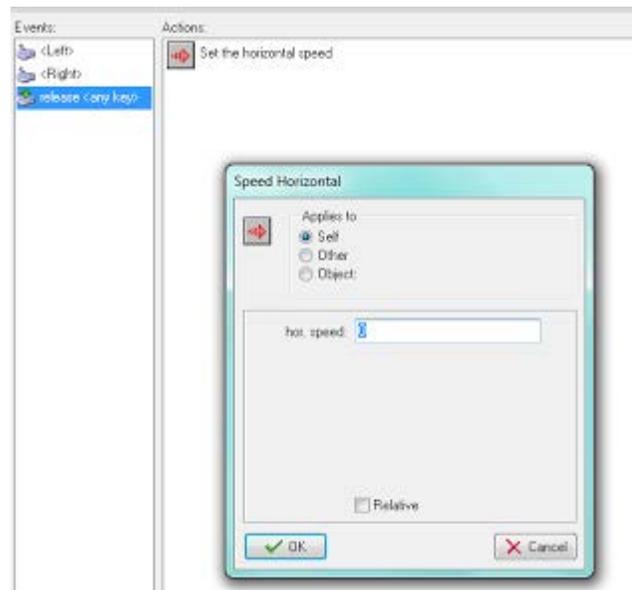
If we choose any key we can use one action for both right and left, as opposed to defining a separate action for each direction.



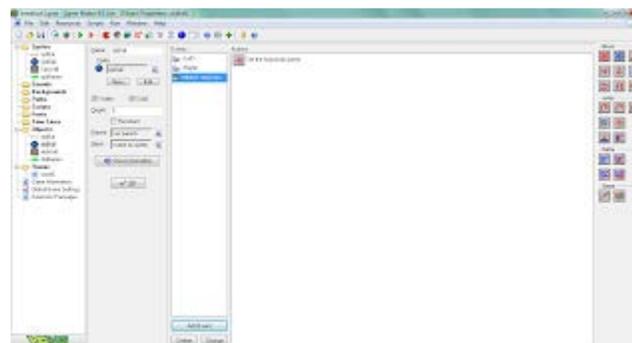
In this case we are going to choose the move horizontal action.



To add move horizontal we left click and drag the icon to the actions portion of the screen. The properties menu will come up. In this case we want to leave the values that default (Speed 0, operates on self).



We should now have events for the left and right key on the keyboard and an event for the release of either key.



Give it a try and see what happens. If you need to edit an action you can right click on the action and choose Edit Values to make changes (speed direction and so on.)

Make sure and save once in a while.

# Moving the Ball



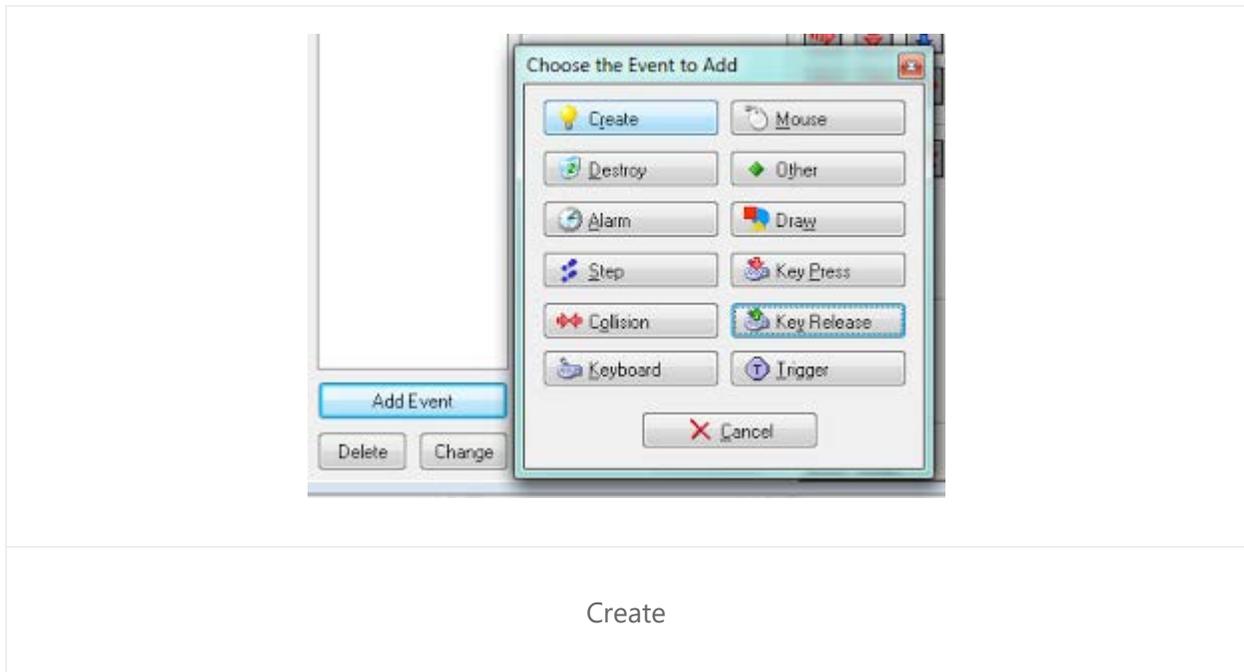
Let's add actions to our Ball. If you can't see the list of objects on the left, use the plus sign to the side of objects to expand it and then double click on objBall to bring up the properties.



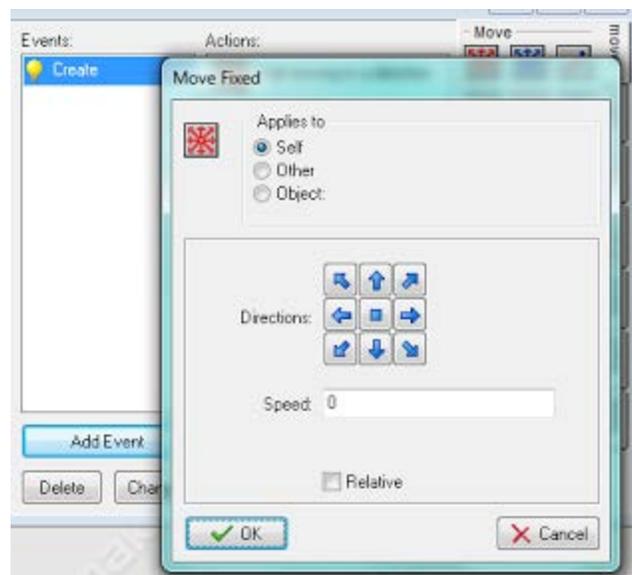
You should then have a window:



For the ball we will use the Add Event and choose Create.



Next we will drag the move fixed icon from Move to Actions to bring up the action properties and add move fixed to the ball's actions.



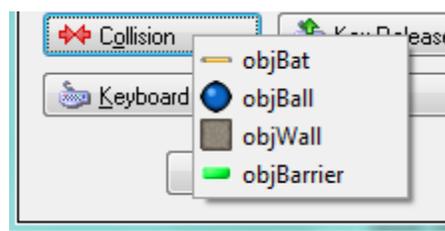
We leave it set to Self and choose all the down arrows to make the ball start moving down. The speed you then enter will control how fast the ball will start moving. (The larger the number the faster the ball goes). I filled in a speed of 8.



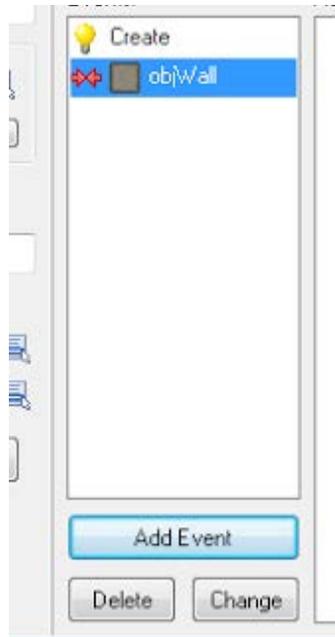
Next we want to set up so that if the ball hits a wall it will bounce. (We will also do this with the bat next). We now want to choose Add Event – Collision.



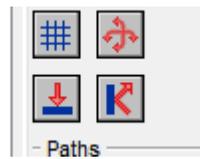
Collision will bring up the list of objects that the ball can collide with. Notice Ball is listed (you can add more than one ball to the room and make them react to each other...) We have one ball for now and are working on interaction between the Ball and the Wall so we will choose objWall.



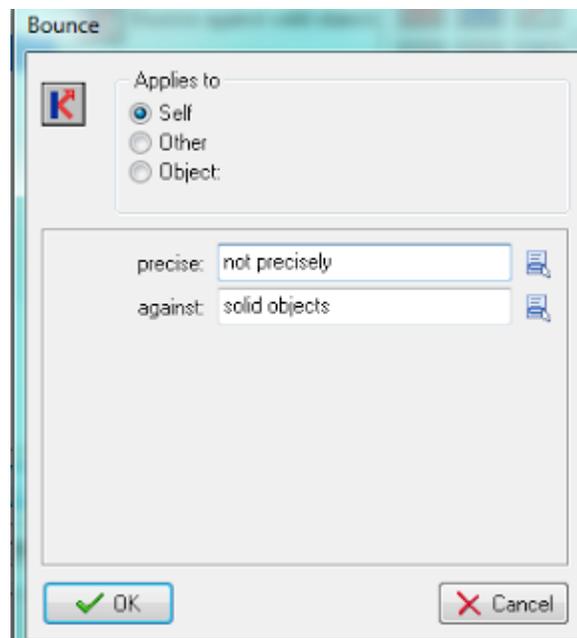
You can now see it listed in the events and selected. When the ball collides with the wall, we want it to bounce off.



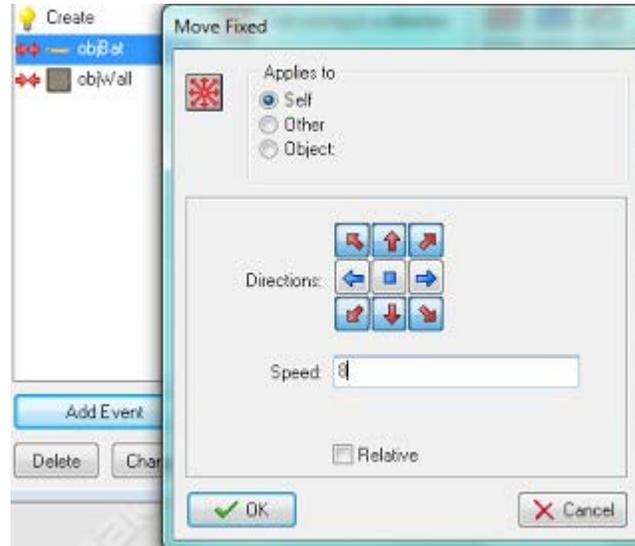
So we will drag the Bounce Icon (from the right) into actions.



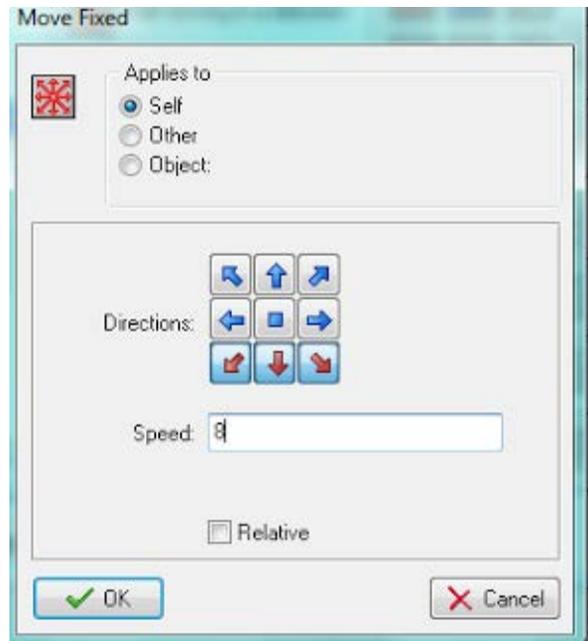
Leave the default settings so that the ball will bounce randomly and click OK.



Now we will do the same thing for the Bat. Choosing to add a collision event and choosing Bat to the Events. Drag Move Fixed to the Actions and choose to move the ball up or down when it hits the bat choosing all up and down directions like below.



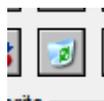
Also set the speed. I chose 8. Finally we will do this again for the Barrier. With the Barrier we will just set the ball to move down after hitting a barrier. I am setting the speed to 8, but for a level of difficulty later you could modify the barrier to cause the ball to speed up when it bounces off a barrier by choosing the relative checkbox (The larger the number in this the faster it will speed up, relative works by adding the new number to the old to get the speed – so if you start with 8 and have a barrier set to 8 and relative, the first barrier hit will set the speed to 16, and the second to 24 and so on.)



Next we want to make the barrier disappear when it collides with the ball. So leaving collide with barrier highlighted in events. We will select the Main1 tab on the right.



Drag the Destroy Instance Icon below into the actions window. Select the Other option under applies to so that the barrier will be destroyed and not the ball and click OK.



Our Ball Properties will look like:



Now choose OK,

# Adding a Score



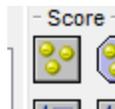
We need to work with the Ball object, so we will double click on the ball object.



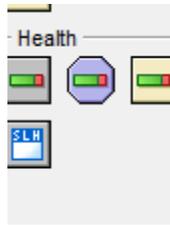
Now on the far right there is a tab for score. Selecting the score tab makes the objects that work with the score available.



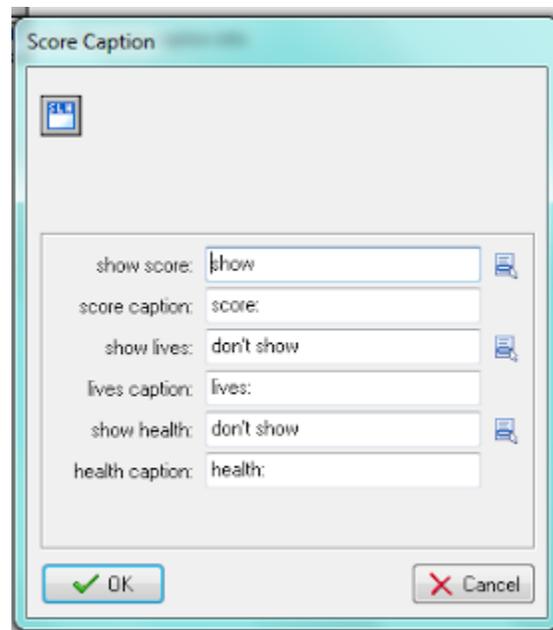
Now we see the score objects that can be added as actions to the events. We want to add be have the create event for ObjBall selected and then drag the score icon to the actions....



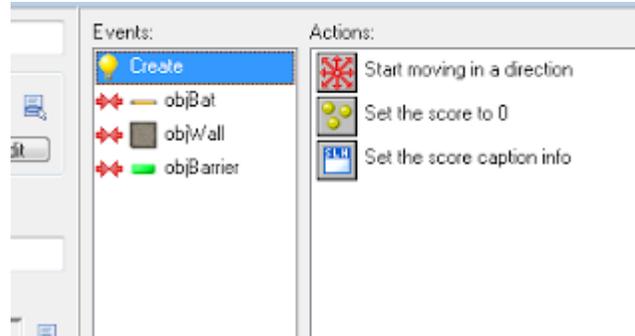
We will leave everything set as is for this and just choose ok. (Setting it to score 0 and relative not checked. – Thus starting our score at 0) Next we want to add the action to display the score on the screen. This is under Health in the icons.



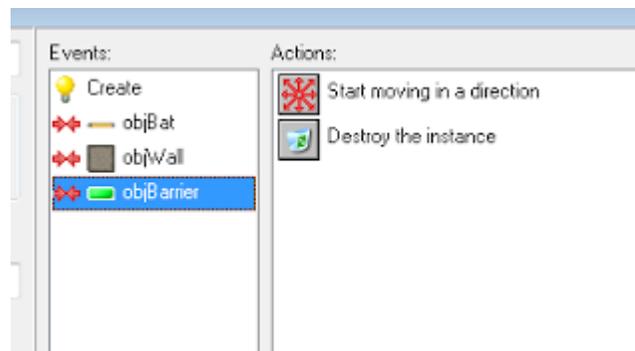
Display a Score Caption



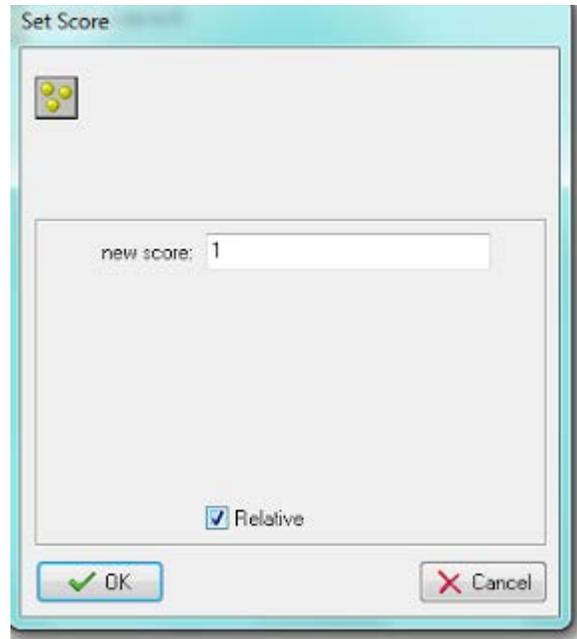
There are several options here which for now we will leave as is. You can see the show score is set to score, caption to score: and don't show health or lives. Choose OK to leave the Defaults. Now our Ball Object Create Event should look like:



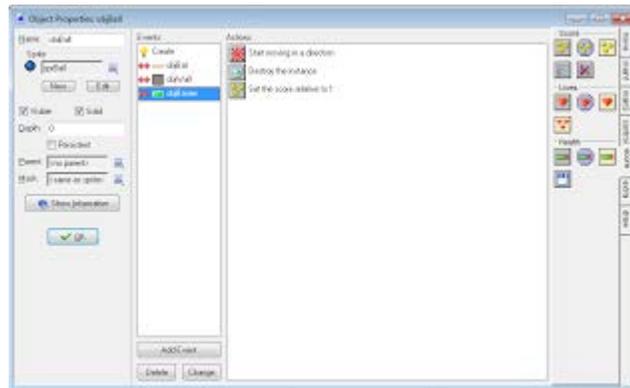
Now we want the score to change each time a Barrier is destroyed. So we will select the Collision with Barrier Event:



To add to the score we will add the Set Score icon to the Action for Collision with Barrier. In this case we want to add one point for each time a barrier is destroyed. So we will set new score to 1. To define that the score should add 1 as opposed to set the score to 1 each time we will check the relative box. Without checking the box the value will change to 1 with the first barrier being destroyed and stay that way. With relative checked the score will be *current score + 1*.

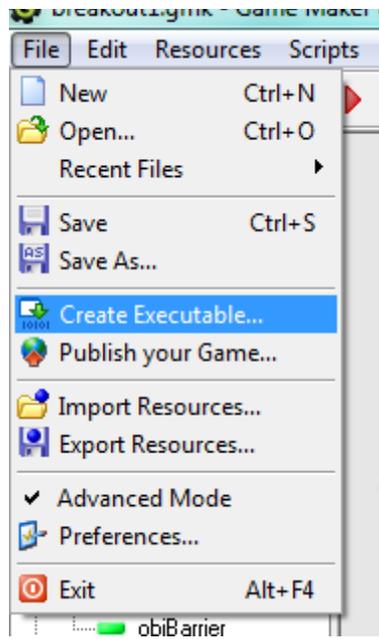


Now our Collision with Barrier on Obj Ball should look like:



Finally click OK and we are ready to play!

To share your game with friends choose the create executable under the file tab....



If you plan to send your game to your friends through email you will need to compress the file first as most email programs won't send or receive .exe files.