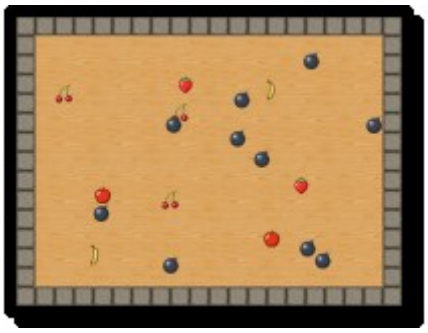
Your First Game

Welcome to *GameMaker*. This tutorial shows you how to create your first game. It will take just 30 minutes to complete and will teach you the important basics of *GameMaker*.

In the game we create, some pieces of fruit move around. The player must click on the fruits with the mouse to collect them. For each collected fruit, points are scored. Fast moving fruits give more points than slow fruits. And there are bombs lying around that you should avoid. The game will look as follows:



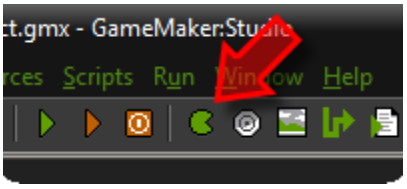
The game will use some special resources created for this purpose. To find them on your computer, please go to the top of the *GameMaker* screen and select the **Help** drop-down menu. You will see an option marked **Open Project** in explorer. If you select that then the standard file explorer will open showing the contents of you *GameMaker* project directory, and there you can browse to "Assets". All resources are stored here. In the process of this tutorial you will be reminded of this location.

*Click on the **Next** button to go to the next page of the tutorial.*

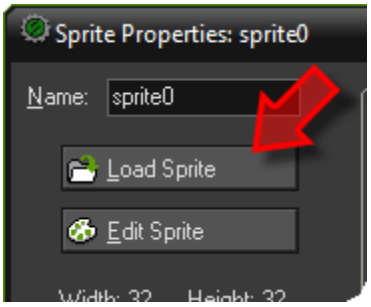
Adding Sprites

Our game needs images for the walls, the fruits, and the bomb. Such images are called **sprites** in *GameMaker*. So the first step is to add some sprites. To do so, we will use some sprites that have been prepared especially for this tutorial.

To add a sprite click on the **Resources** menu and press **Create Sprite** or click on the button with the Pacman symbol:

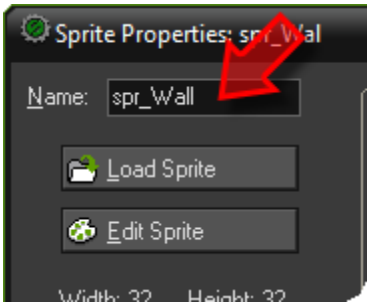


A rather empty form will appear. In this form, press the button **Load Sprite**.

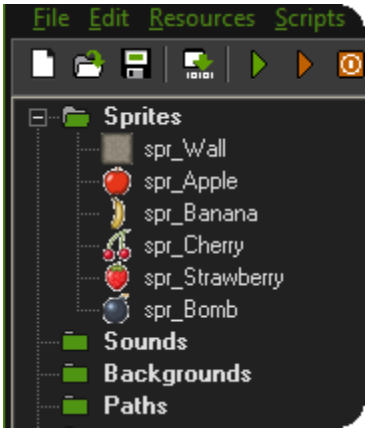


In the file selector that appears you must browse to the **Project** folder, then select **Assets**, this may be the default location already. Once there browse the available resources and double click on the image `wall.png`.

The sprite form should now show the wall block image. You might want to give the sprite an appropriate name, e.g. `spr_wall`.



Now press the **OK** button to close the form. At the left of the *GameMaker* window you should now see the sprite you just added. In the same way add sprites for the apple, banana, bomb, cherry, and strawberry and give them appropriate names. The list at the left of the window should now look as follows:



Before continuing you might want to save your work. Click on the **File** menu, press **Save**, and select an appropriate location and file name. Note that the file will get the extension `.gmk`. All files created with *GameMaker* will have that extension.

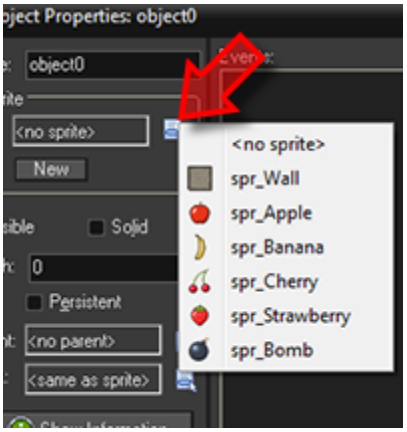
*Click on the **Next** button to go to the next page of the tutorial.*

Creating Objects

Sprites are just images. They don't do anything. But objects in your game must perform actions. They must move around, react to mouse clicks, etc. So the next step is create some objects. We will start with the wall object. To add an object click on the **Resources** menu and press **Create Object** or click on the button with the green ball.

The form that appears might look a bit complicated but don't worry. It will soon become clear.

We first give the object an appropriate name `obj_wall`. Next, to give it the appropriate sprite, click on the menu icon to the right of `<no sprite>` and from the menu that appears select the wall sprite:



The wall object must be solid cause we do not want the fruit to move through it. To this end, press the checkbox **Solid** to select it. As the wall needs no further behavior, press the **OK** button to close the form. The wall object should now have appeared in the list at the left. Better save your work before continuing.

The Apple Object

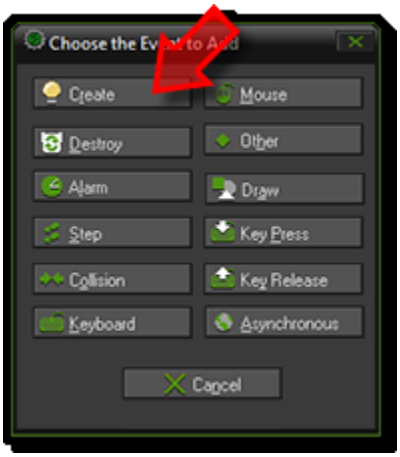
We are now going to create the apple object. Again press the button on the toolbar with the green ball, to create a new object. Give the object as a name `obj_apple` and select the apple sprite for it. The apple is not solid. So the form should look as follows:

Our apple object will need some behavior. First of all it must move around. And secondly it must react to mouse clicks. In *GameMaker* behavior is defined as follows: Objects get **events**. An event happens when for example the object is created, when it collides with another object, and when the user presses the mouse button or a key on the keyboard. You can indicate that the object should react to certain events by executing **actions**. For example when the create event happen we can execute an action to start moving.

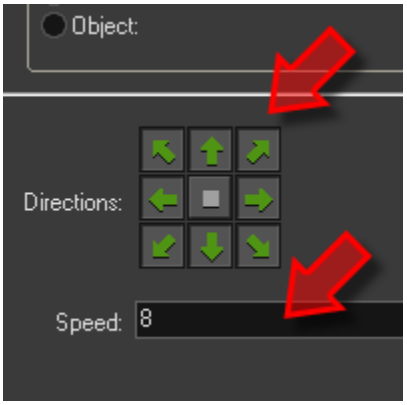
In the object form, in the middle there is the list of events (empty at the moment). To the right of this there is the list of actions to be executed for the selected event. And at the far right there are

six tabbed pages with all the different actions you can use.

Our first step is to make sure the apple starts moving when it is created. Press the button **Add Event**. A form appears in which you select the **Create** event:

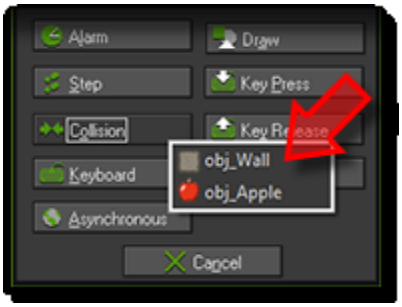


The event is added to the list. We can now include actions in this event by dragging them into the action list. Press and hold the mouse on the top-left action with the eight red arrow, drag it into the action list and release the mouse button. A window will open in which you can indicate the directions of motion and the speed. Press all eight arrows to indicate the apple can move in any of these directions. As a speed, type in 8. Finally press OK to close the window.



We have now indicated that the apple, when it is created, should move in any of the eight directions with a speed of 8. Next we must make sure it bounces against the walls. For this we need a **collision event**. This happens when two objects collide with each other.

Press the button **Add Event** and in the form click on **Collision**. In the menu that appears select the wall object.

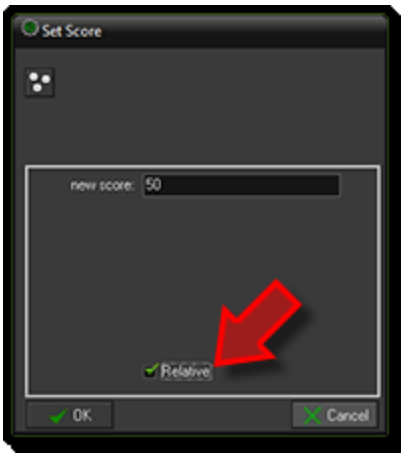


The event is added to the list. Make sure it is selected. Now click the bounce action (the bottom right one) and drag it into the action list. In the form that appears simply press the **OK** button.

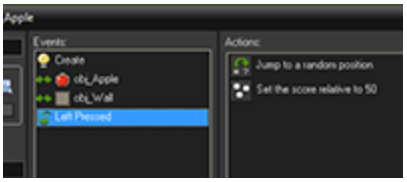
Our final step is to make sure the player can press the mouse on the apple. In this case we want to move the apple to a random location (to make it harder for the user to press on it again) and we want to give the player some score.

Again press the **Add Event** button and in the form click on **Mouse**. In the menu select **Left pressed**. This event happens when the player presses the left mouse button on the object. Drag the **Jump to Random** action to the list. (You can see the name of an action by letting the mouse hover over the button).

In the form that appears simply press the **OK** button. This will make the apple jump to a random location. Next we need to give the player some score. At the right of the form, select the tabbed page labeled **score**. A new set of actions appears. Drag the top-left **Set Score** action to the action list. In the form indicate a new score of 50. Now we do **not** want to set the score to 50 but we want to **add** 50 to the score. To this end click on the check-box **Relative**.



This concludes the definition of the apple. The event and action list should now look as follows.



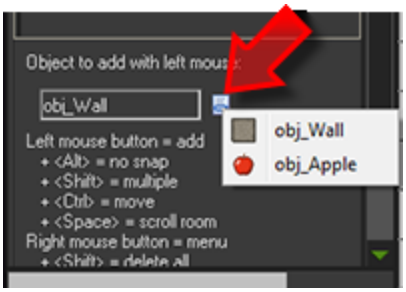
Press **OK** to close the object form. We now defined our two important objects: the wall and the apple, which are now both shown in the list at the left. Better save your work.

Creating A Room

Now that we have defined our wall and apple, we need to create a room in which to put them. Rooms are what the player sees when he/she plays the game. Our game will need just one room but games made with *GameMaker* can have many different rooms. To create a room, click on the **Resources** menu and press **Create Room** or click on the corresponding button on the tool-bar:

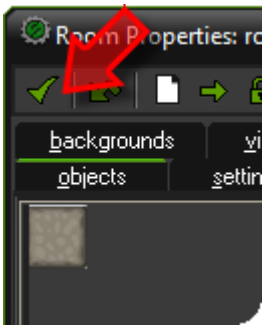

The room form will appear. At the left there are three tabbed pages: objects, settings, backgrounds. Make sure **objects** is selected. At the right there is an empty area that is the actual room. If your screen is large enough, better scale the form such that the whole room is visible, or use the mouse wheel or toolbar icons to scale the room itself.

We can now add objects to the room. At the bottom left, click on the menu icon and in the popup menu select the wall object:



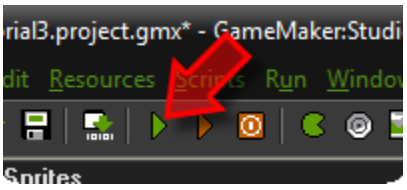
Now click with the left mouse button in the top left of the room area. An instance of the wall object should appear. Continue adding wall objects until you create a complete boundary around the room. If you make a mistake you can use the right mouse button to delete instances. (If you want to do this faster, in the tool-bar set the values of **Snap X** and **Snap Y** to 32, the size of the sprites, now you can draw multiple wall sprites by holding the <Shift> key.)

Next we want to add some apples. Again click on the menu icon and in the pop-up menu select the apple object. Place two or three apple objects at random places in the room. That finishes the game. Press the green check-mark sign in the tool-bar of the room form to close it.

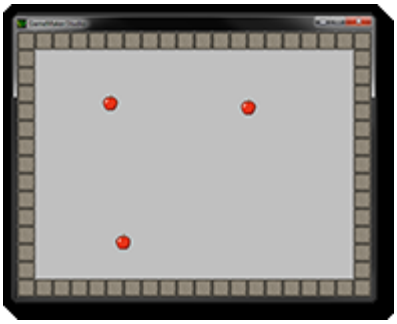


Testing The Game

Now it is time to test the game. Better save the game first. Click on the **Run** menu and press **Run normally** or press the green run button in the tool-bar.



If you followed the previous steps correctly the *GameMaker* window disappears and a window shows in which the apples move around. If they hit the wall they should bounce back. And if you manage to click with your mouse on one of the apples, it will jump somewhere else.

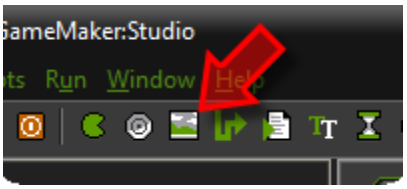


Better check the game carefully. Do the apples move in different directions? If not you probably did not create the correct **Create** event. Do they bounce of the walls? If not, you probably either did not make the walls solid or you did not create the correct **Collision** event. Can you click on them with the mouse? If not you must have made an error in the **Mouse press** event.

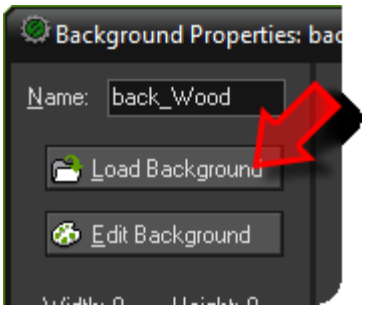
You can switch the game to fullscreen mode by pressing ALT+ENTER. Press Esc to end the game.

Adding A Background

Assuming your game did work as expected, we are now going to make it look a bit fancier. First we will add a wooden background image. Click on the **Resources** menu and press **Create Background** or click on the button with the image:



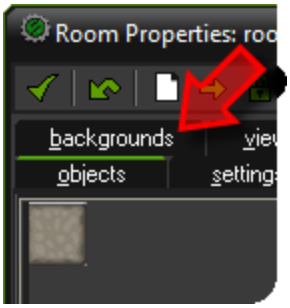
In the form that appears, give the background an appropriate name and press the **Load Background** button.



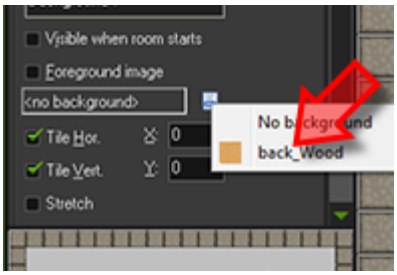
In the file selector that appears go to the same folder as previously mentioned for the sprites

(**Your Project** then **Assets**) and in there find the image marked `wood.gif` and double click on it.

Press **OK** to close the form. The background should now be visible in the list at the left. The next step is to make the background visible in the room we already created. To reopen the form for the room, double click on it in the list at the left. (Don't add a new room!). In the form, click on the tab **backgrounds** to open that page.



In the middle click on the menu icon, next to where it says <no background> and select the wooden background. The background should now be visible in the room at the right.

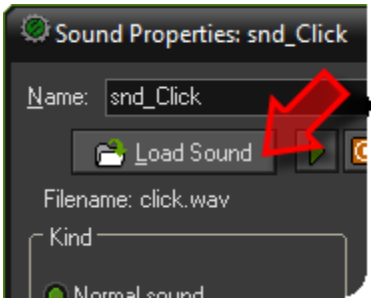


(Note that there are many options you can set about backgrounds in rooms but we don't need them here. You can find more information about this in the help file.) Press the green check-mark at the top left to close the room form. Now better save the game and run it to see whether the background is shown correctly.

Adding A Sound

Next we add a sound effect to the game. This effect must play when the player clicks on an apple. Click on the **Resources** menu and press **Create Sound**or click on the button with the image of a speaker:

In the form that appears, give the sound an appropriate name and press the **Load Sound**button.

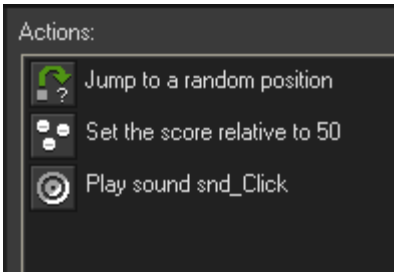


In the file selector that appears open the folder where the resources are (the same as where you found the sprites and backgrounds) and in there double click on the sound file `click.wav`.

Press **OK** to close the form. The sound should now be visible in the list at the left. We now need to make sure the sound is played when the player clicks on an apple. Reopen the apple object by double clicking on it in the list at the left.

Select the **Left Pressed** event, by clicking on it in the list of events. In the list of actions you will now see the jump and score actions. At the right of the form, select the tabbed page labeled **main1**. A new set of actions appears. Drag the action with the speaker on it to the list of actions to play a sound.

In the form that appears, select as a sound the click sound (click with the mouse on the top menu icon to select the sound). Make sure to keep the value of **loop** to false as we want the sound to play only once. Next press the **OK** button. The action list should now look as follows:



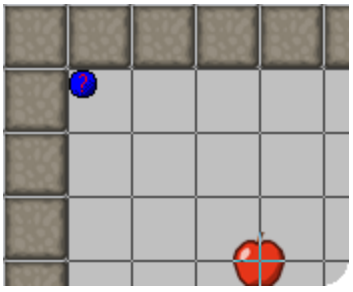
Again press **OK** to close the object form. Save and play the game, and now the sound should play whenever you click on an apple.

Adding Music

To improve the atmosphere we are going to add background music to the game. Click again on the button to add a sound. In the form give the sound an appropriate name and press the **Load Sound** button. You should still be in the folder with the sounds for the tutorial. Select the file `music.mp3`. This is an mp3 file, which are useful as background music as they are rather small, and many can be found for free on the internet. Press **OK** to close the sound form.

Now we need to make sure that the sound will play at the beginning of the game and loop forever. We are going to use an additional object for it. Press the button with the green ball to add a new object and give it an appropriate name. It does not need a sprite. Click on the **Add Event** button and select the **Create** event. At the right side select the page **main1** and drag the **Play Sound** action into the action list. (You should by now know how this works.) As a sound select the music and set **loop** to true. So the music will now play forever after the object is created.

Press **OK** to close the action form and again press **OK** to close the object form. We still need to add the object to the room, otherwise it won't be created. In the list at the left double click on the room to open its form. Make sure the **objects** page is visible at the left. Click on the menu icon in the middle to select the music object. Now click somewhere in the room to add an instance of the object. The object has no sprite so a little blue ball with a question mark is shown instead:



Be careful to only add one instance of the music object. Press the green checkbox to close the room form. Save the game and run it. You should now hear background music.

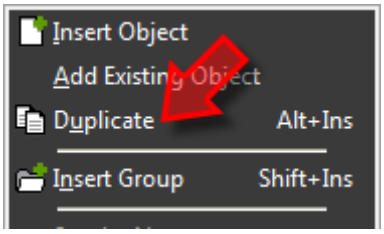
More Fruit

Let us now add some variation to the game by including other types of fruit. Because the steps are the same as before we only describe the global details. The sprites for the fruits are already there so we don't need to add them anymore.

Add a new object (click the green ball). Give it an appropriate name and give it the banana sprite. This one is going to be a bit more difficult to click on. Add the **Create** event and in it add the action to move in a fixed direction. Only select the diagonal arrows and give it a speed of 12.

Add a **Collision** event with the wall object and it in add the action to bounce, just as before. Next add the **Mouse** event for **Left pressed**. In it add the action to let the object jump to a random position. Add the action to set the score (from the **score** tab) with a value of 100 (this is a more difficult fruit so you should get a higher score), and don't forget to click the **Relative** box to add the value to the score. Finally add the action to play a sound (from the **main1** tab) and play the click sound.

In the same way add an object for the cherry and for the strawberry. You can give them different speeds and corresponding higher or lower scores. If you find this all a lot of work, you can also right-click on an existing object and select **Duplicate**. This creates a copy of the object. You can now change the name and sprite, and change the values for the different actions (by double clicking on them).



Now reopen the room (double click on it in the list) and add a few instances of the different fruits. You might need to remove some apples to make room. Remember that you can use the right mouse button to remove instances.

Save and play the game. Test it all carefully.

Adding Bombs

Although the game can already be fun to play, there is something missing. You cannot lose! You can just keep clicking randomly, which is not really much fun. Hence, we are going to add bombs to the game. If you click on a bomb you will lose and the game will end. Bombs will be static. They won't move, but their number keeps increasing to make the game more and more difficult over time.

The bomb sprite is already present but we still need a sound effect for it. Press the button with the speaker to add a sound. Give is an appropriate name, press the **Load Sound** button and select`explosion.wav`. Press **OK** to close the sound form.

Now create the bomb object by clicking on the green ball button. Give the object an appropriate name and the bomb sprite. We want the bomb to appear in a random place. To this end, add the **Create** event. In it place the action to jump to a random location.

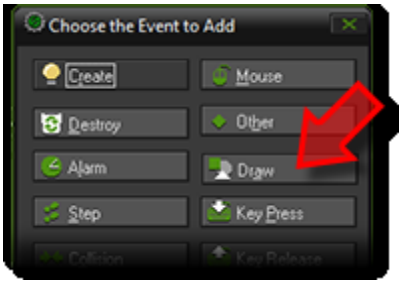
When the user clicks on it we want the game to end. So add the **Mouse** event **Left pressed**. As a first action we want to play the explode sound so add the play sound action (from the **main1** tab) and select the explode sound. Next we want to reset the score to 0, so goto the `Control`tab and select the `Set Variable` action and write "score" for the variable and "0" for the value, then drag the `Restart Room` icon from the `main1` tab. This will restart the room when the player clicks a bomb.

Save the game and give it a test to see if everything works as it should.

Adding Score

As a next step we want to show the player their score on the screen. For that we are going to have to use the `Draw Event`. Now, there is no need to create another object for this as we already have an object available : the `obj_Music`. It's always a good idea to try and limit the objects that you have in your games to only those you need, and as one object can do multiple things, we can use this one for the music *and* to draw the score! Such objects are usually called **controller** objects as they *control* parts of the game but are not direct gameplay elements.

Open the `obj_Music` object and create a draw event now.



Since `score` is a variable, you now need to go to the **Control** tab and drag the **draw variable** action into the newly added draw event.

In the draw action, the variable to draw is "score" and the x and y should be set to 64 each, which will draw the score in the top left corner of the room.

If you run the game and click on a few of the fruit instances (and avoid the bombs!) you will see how the score changes, going up by different amounts depending on the difficulty of the fruit that has been clicked on.

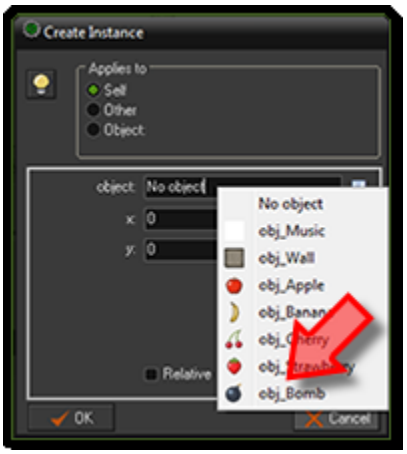
Save your game before continuing.

Creating Bombs

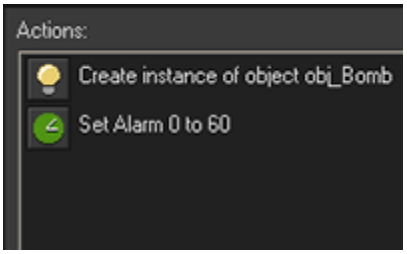
To make the game more difficult we want to create additional bombs while playing the game. We can create a new object to do this but we can as well use the music object for this. So reopen the music object by double clicking on it in the list at the left.

To create the bombs we will use alarm clocks. You can set these clocks to a particular value and they will then tick down to 0. Once they reach 0 an **Alarm** event will happen. To initialize the alarm clock, go to then **main2** tab and drag the top left action (with the clock image) to the action list (below the play sound action). As **number of steps** indicate a value of 60. A second is 30 steps so we will add a new bomb every 2 seconds. Make sure alarm 0 is selected.

Now press **Add Event**, click on the **Alarm** events and select in the menu **Alarm 0**. In this event we will create the bomb. Go to the **main1** tab and drag the top left action in the action list (the light-bulb). Click on the menu icon and select the bomb object.



There is no need to set a position as the bomb will anyway jump to a random position. Next we must set the alarm clock again. So add the alarm action (from the **main2** tab) and set alarm 0 again to 60. This will repeat the process. So the action list now looks as follows:

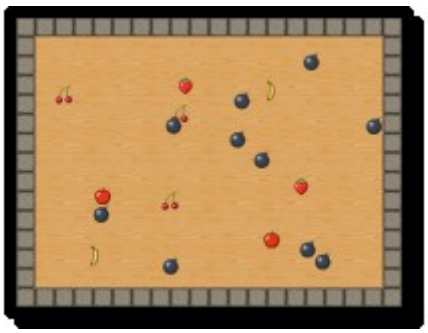


Close the object form, save the game, and run it. You should see more and more bombs appearing and eventually you will click on one of them and the game will end. If you want to

make the game a bit harder, you can also let the bombs move slowly. You should by now know how to achieve that.

Congratulations!

You have now finished your DnD game. As you saw, it was not very difficult, and your game should look something like this:



If it did not really work correctly, you can always load the game from the `Examples` folder. Once the game is ready you might want to give it to your friends. But they might not have *GameMaker*. To this end go to the **File** menu and click on **Create Executable**. Indicate the name (and location) and press **Save**. You will now have a stand-alone game that you can give to everybody to play.

You have learned about the most important elements of *GameMaker*: sprites, backgrounds, sounds, music, objects, events, actions, and rooms. You should now be able to start making your own games. But there is a lot more to learn. You can check the help file or you can read some more tutorials. And there even are books about *GameMaker*. You can access all this information through the **Help** menu. Enjoy!