A QUICK INTRO TO PHYSICS IN CLICKTEAM FUSION 2.5
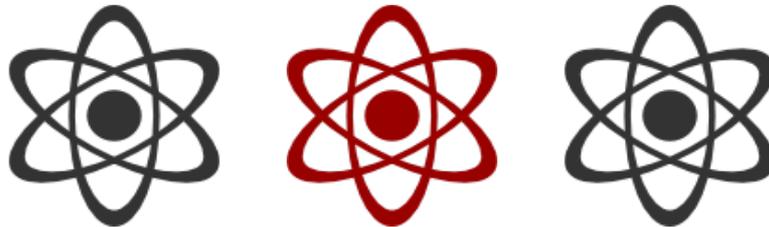
INTRODUCTION

Welcome to this introductory guide on inserting Physics objects and applying some of the available conditions, actions and events in Fusion 2.5.

This is not an exhaustive Physics guide, just an introductory guide to get you on your way around the physics objects in Fusion 2.5.

Welcome to this guide on using Binary Data for Clickteam Fusion 2.5! Some (if not all) of the information in this guide is applicable for Multimedia Fusion 2.0 also. As with all tutorials and guides written in PDF, feel free to display it as a PDF or print to paper. You can study and learn these practices at your own pace, in your own time.

Due to Fusion 2.5's flexible nature of allowing users to accomplish the same result in multiple ways, sometimes there are alternative ways to perform certain routines or functions. These guide(s) will explicitly target the most common, easiest and most effective route.

These hand-written guides are here to help you target or perform a particular routine in Fusion 2.5 enabling you to harness the full potential of what Clickteam Fusion 2.5 can actually do for you as a developer. Whether it's game design or application development you want to do with Fusion 2.5, these guides will hopefully guide you from top to bottom in whatever you're looking to achieve.

This guide has been thoroughly checked before deployment. As always, feedback, comments and suggestions are always welcome on the detail, structure and formatting of these guides. Rather than create individual guides for different learning levels, we hope to be able to reach to all entry level, intermediate and advanced users within the same guide on achieving the same goal.

For more information on how you can download and purchase Clickteam Fusion 2.5, check out the website http://www.Clickteam.com

For more information, tutorials, examples and walk-thrus visit the website.

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1. AN INTRODUCTION TO THE PHYSICS OBJECTS

Fusion 2.5 has a lot of focus around the Physics Objects and rightly so. The physics engine (Box2D) has been almost built-in to the main Fusion 2.5 runtime. This is great news for enthusiasts and professionals alike. It now means you can introduce Physics into your game concepts and export them across all platforms.

The bonus advantage to using Physics based movements and concepts is; there is now a whole world of new types of games you can create, the possibilities are almost endless.

Whether you want to create the next Angry Birds-like game or whether you want to create something unique in the game world, now is your chance with the Physics Engine and Fusion 2.5!

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2. THE PHYSICS ENGINE

The Physics - Engine object is the driving force behind your physics-based applications. It contains the code necessary to make the objects to move in a physical-oriented way. This object must be present in the frame if you use one of the physics-driven movements. This object also contains a number of actions to control and affect the objects of your physical world.

Without the Physics Engine object inside your frame, physics movements will not be available.

With the Physics Engine object, you can control the entire world inside your frame. You can set, modify and adapt gravity strength, gravity angle, set object properties such as friction, density, elasticity and gravity scales applied to each individual object.

The Physics Engine also allows you to use Standard Fusion movements too, so for example if you have an enemy that just walks left and right on a platform, you can allow the engine to incorporate this into the physics world so anything it touches, it will interact with.

You can create 'joints' where objects are joined in some way, shape or form. Whether it's in the form of a Distance Joint, Revolute Joint or a Prismatic Joint.

As with most extensions, you can also retrieve a number of real-time expressions, such as current gravity strength, damping, object velocities and much, much more. We will cover all of this in future guides and examples but for now, let's move on to some basic objects and applying some basic physics routines in an example.
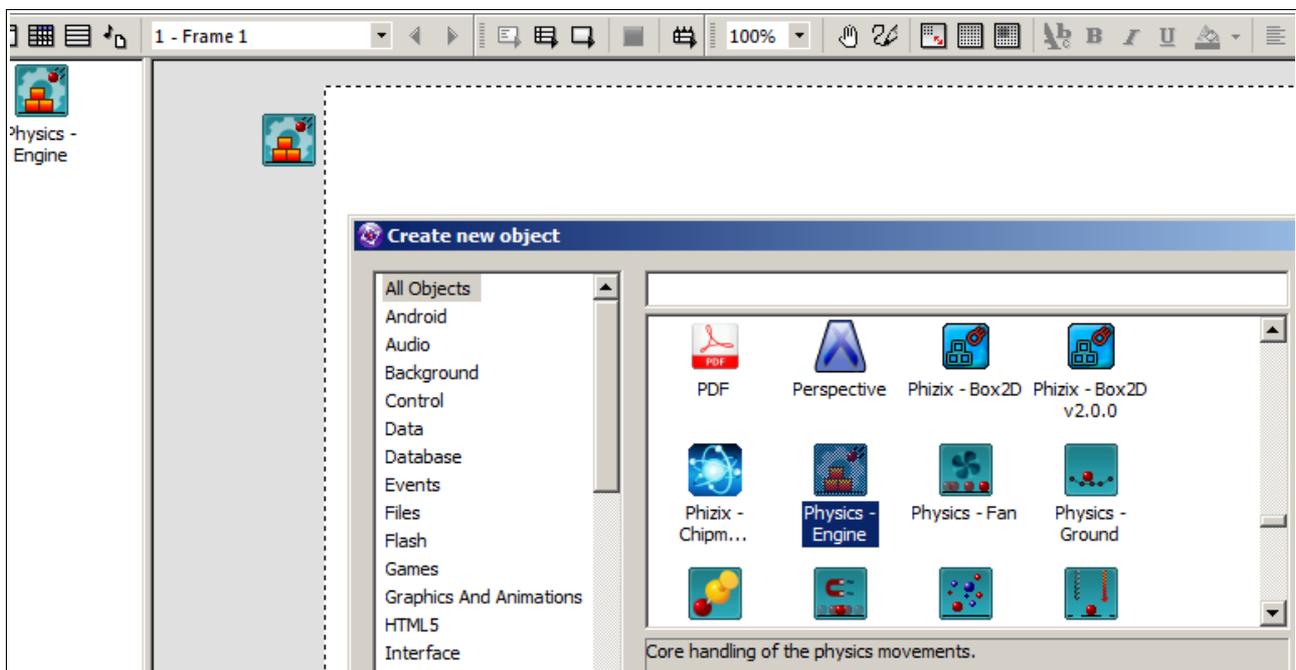
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3. USING THE BUILT-IN PHYSICS MOVEMENTS

Ok, so as explained above in Step 2, you will need to drop in the Physics Engine object somewhere in or outside of your frame. Let's do this by inserting a new object into the playarea. Go to **Insert > New Object**, select the **Physics Object** and put it just outside of your playarea.
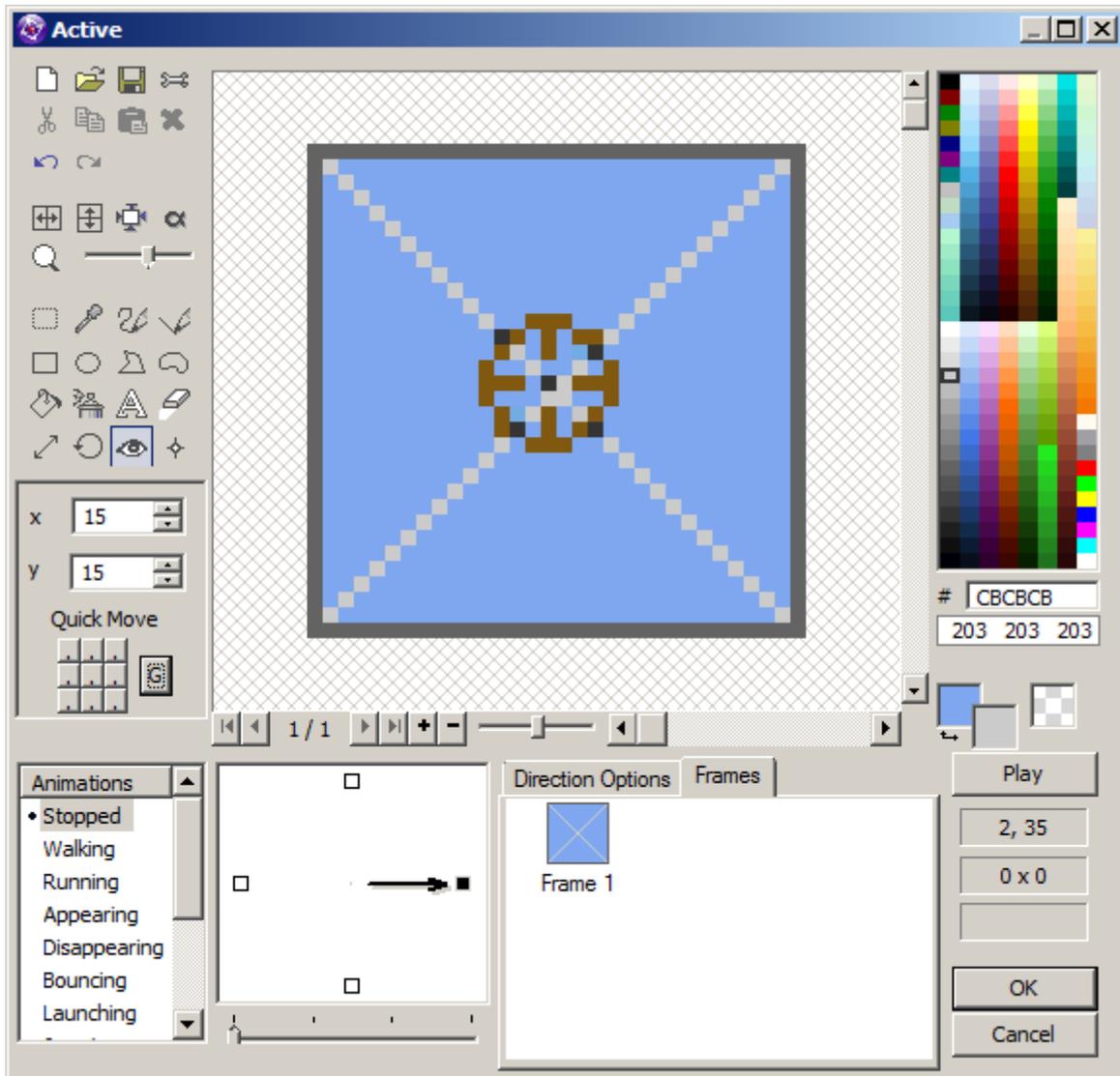

Once you have done that, let's insert an active object. Let's insert a new active object and let's create a box (32x32) like so...

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3. USING THE BUILT-IN PHYSICS MOVEMENTS

Once you have done this, don't forget to click on the Hotspot Icon (eye) and click on 'G'. This will automatically centre the hotspot at the centre of mass. Not necessarily the centre of the image, the centre of the mass of the object. Fusion 2.5 neatly does this automatically for you by just clicking 'G' inside the picture editor.
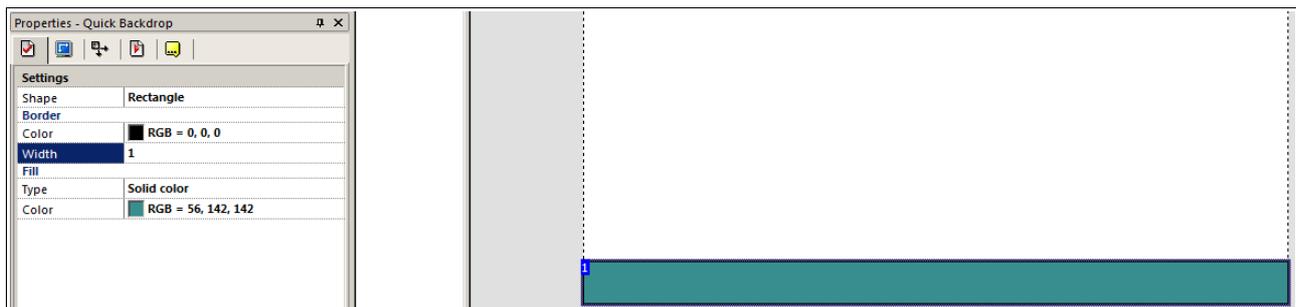
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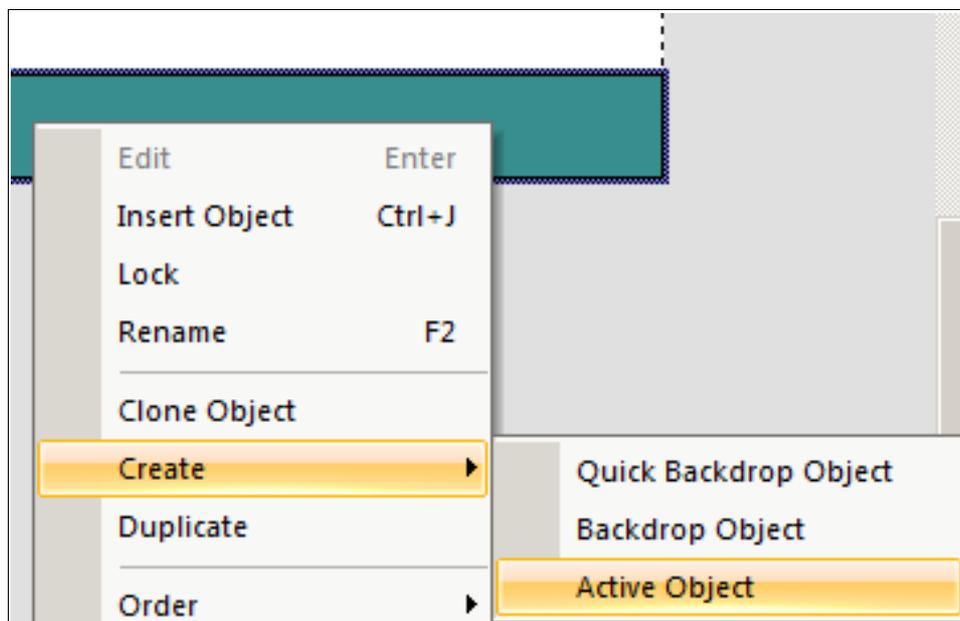**Website:** http://www.Clickteam.com – **Community:** http://community.clickteam.com

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3. USING THE BUILT-IN PHYSICS MOVEMENTS

Now we need to create some kind of 'ground' for our box to land on. So let's insert another object. This time a **Quick Backdrop** object. Stretch it so that it fits our playrea and maybe put a border on it.

Once you are happy with your bit of 'ground', right click on the object and select **Create > Active Object**.

Once done, you can delete the quick backdrop and position your new ground active object at the bottom of the frame. Don't forget to edit the Ground Active Object and set it's hotspot position to 'G'. Now we need to setup some properties for our box and ground so let's do that next.

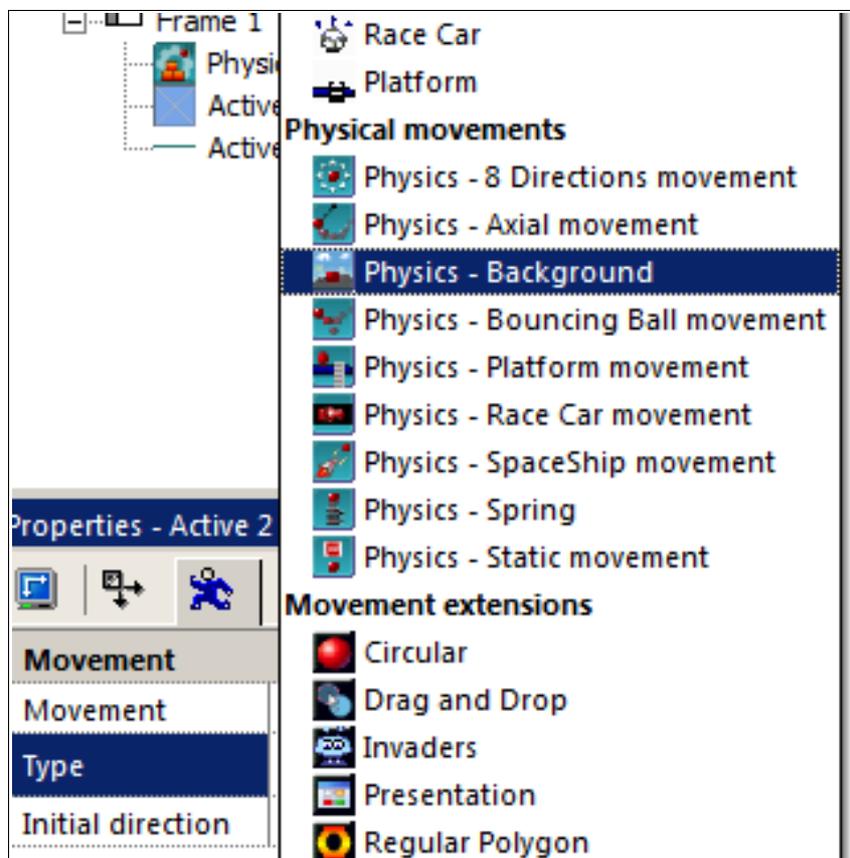For more information, tutorials, examples and walk-thrus visit the website.

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3. USING THE BUILT-IN PHYSICS MOVEMENTS

So, we have our 'ground' in position and we have our 'box' ready to go. Let's setup the properties of these two objects so we can tell our physics engine which is the box and which is the ground and how they should behave in the physics world.

Let's do the floor first. Click on the floor active object and go to the properties box. Click on the Movement tab and in the movement type select: **Physics – Background**.

This will present you with some additional properties you can configure. You can leave everything as it is, except change **Obstacle** to **Obstacle** and change **Collision Shape** to **'Box'**. Now let's move onto our box. Click on the box we created and go to the movement tab, select the **Physics – Static Movement** type.

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3. USING THE BUILT-IN PHYSICS MOVEMENTS

You can pretty much leave it all as it is for now (you can play with the additional properties later) but for now, change **Collision Shape** to **'Box'** and select **'Smooth Rotations'**.

So that is pretty much our 'physics world' setup and we haven't even wrote a single event, expression or line of code yet. That's how easy things are in Fusion 2.5. Now if you Hit F8 to run the game, you will see everything automatically starts working like it would in a physics world, the box moves downwards towards gravity but it drops straight passed the 'ground' active object we created.

Let's hop over to the next page and start working some magic!

4. APPLYING SOME BASIC PHYSICS VIA EVENT EDITOR

Ok, so for the sake of this guide, we're not going to create a 'game' per-se; we're going to create a kind of testbed to get you settled with Physics in Fusion 2.5. Click on the Box object, select the **Runtime Tab** and uncheck **'Create at Start'**. We're doing this because we don't want Fusion to create the box object at the start, we want to create it ourself, from the event editor. We're going to create a simulation of boxes falling from the sky. Let's head over to the Event Editor.

Let's create a new condition. Right click on the Keyboard & Mouse object and select **The Mouse > User Clicks**. In the prompt dialog, choose **Left Mouse**.
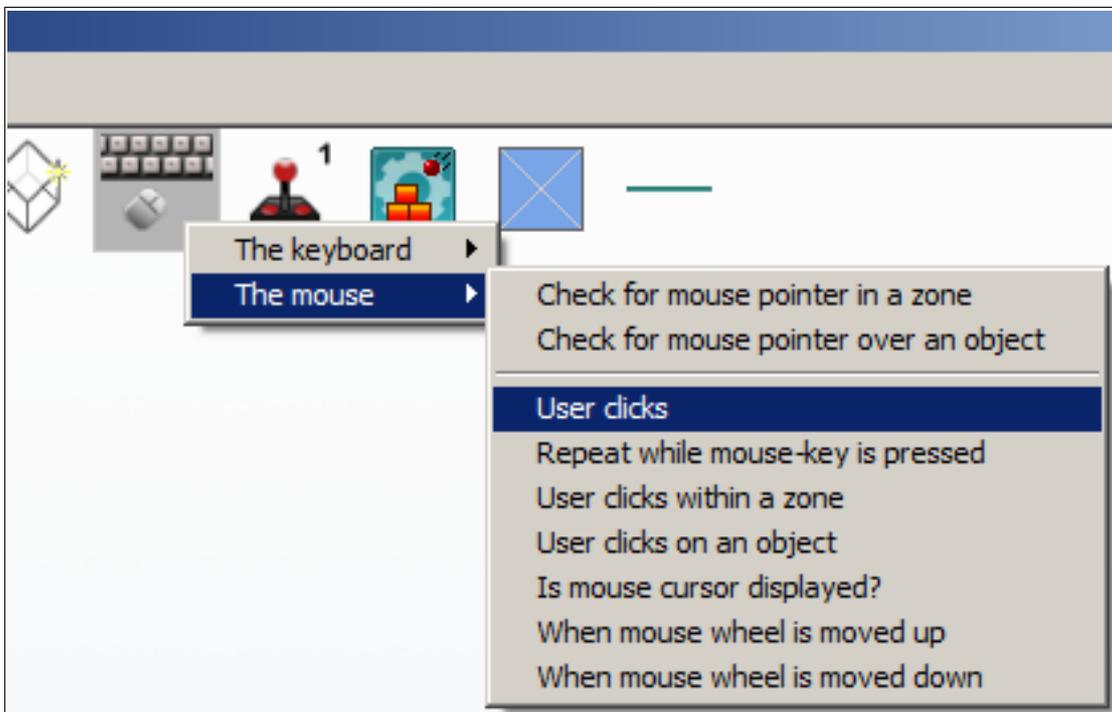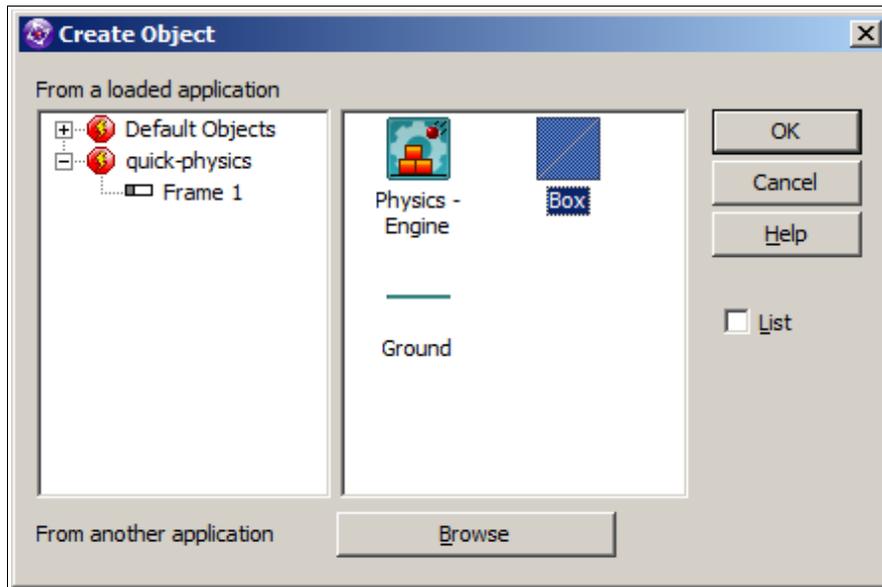

Once you've inserted this condition, hover over to the **'Create Object'** icon, right-click and select **Create Object**.
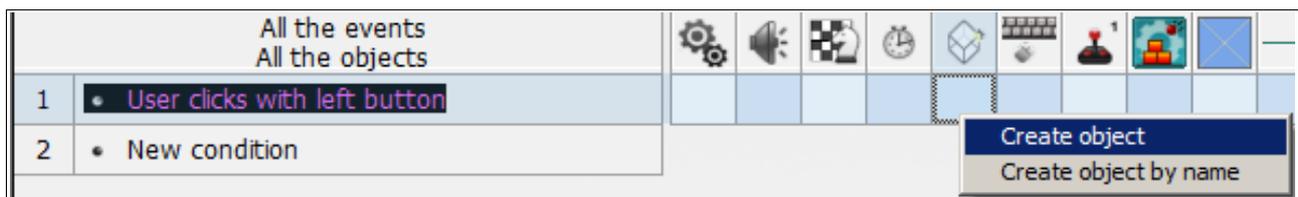
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4. APPLYING SOME BASIC PHYSICS VIA EVENT EDITOR

Click on the 'Box' object and click OK.

Fusion will then ask you where you want to create the object. Select anywhere for now, it doesn't matter because in the next action we will tell the object to instantly move to where the mouse is. So in effect, our object is going to be created wherever we click. Once you've clicked OK, then on the same condition line, hover over to the box, right-click and select Position > Set X Co-ordinate.

When prompted with the expression editor, type in 'Xmouse' and click Okay. Repeat for the Y Co-ordinate and use 'Ymouse' in the expression editor. Once you've done that, save your file and run the application. You should now be able to click anywhere on the screen and create a box.

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4. APPLYING SOME BASIC PHYSICS VIA EVENT EDITOR

So we can now create boxes and as many as we want just by left-clicking anywhere in the frame, very nice. Now, our box is still dropping straight through our 'Ground' object we laid earlier. This is because you need to tell Fusion 2.5 what to do when certain objects collide with other objects. So, let's create a new condition. Select the Box object, right-click and select **Collision > Backdrop**.
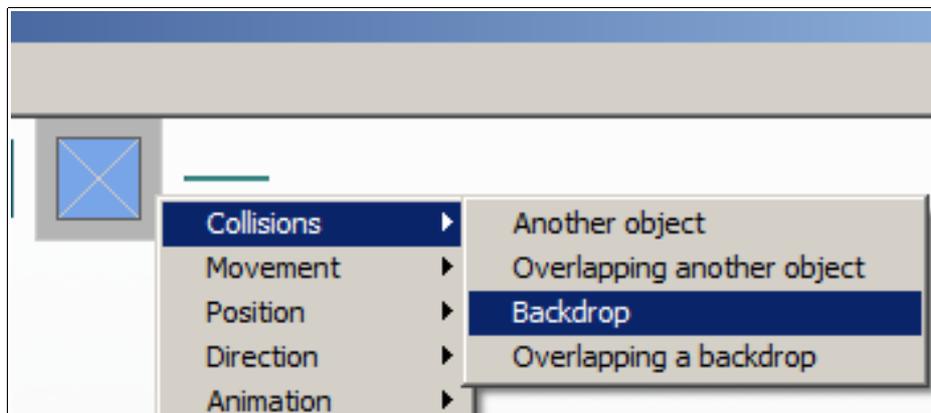
Once you've inserted this condition, hover over to the Box object, right-click and select **Movement > Stop**.

Now, just a note. This does NOT imply 'stopping' the object (speed wise). You are telling Fusion here, if the box collides with the ground stop the box at the collision point, not decelerate. Gravity is always being applied and depending on what angle the box collides with the ground, it could still be moving. However, with the way we have our flat surfaces laid out, this shouldn't be an issue for the moment.

Hit F8 and run your application, start creating some boxes and notice how they now stop when they make contact with the ground. But the boxes are falling through each other?

Again, we need to tell Fusion about this. We need to say when a Box collides with another Box, stop the movement. This will stop the objects from overlapping each other.
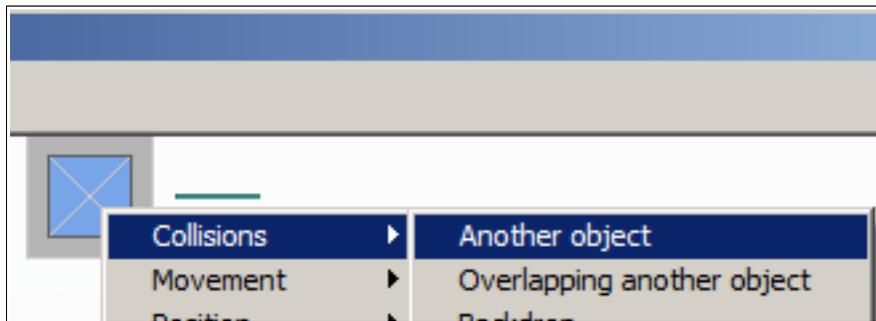
4. APPLYING SOME BASIC PHYSICS VIA EVENT EDITOR

So, let's create another condition. If Box collides with Box, **Movement > Stop**.

Once you've done this, hit F8 and run the application again. Now create lots of boxes in lots of different areas of the frame and watch the magic come together. We have created this in literally, 3 events and just 5 actions.

You can now have a play about inserting more objects, such as balls and applying Circles to the Collision Shape in the object properties and much, much more.

Do drop in some of the other Physics objects (extensions) available in the extension manager. All of them come with available help files and examples in the Fusion 2.5 folder.
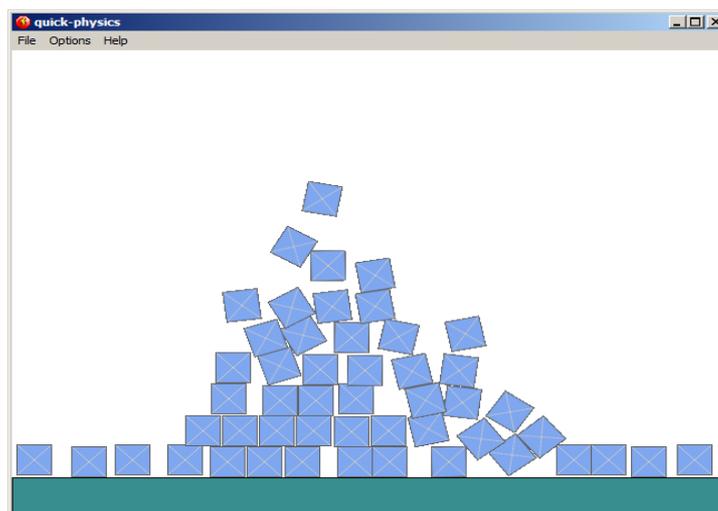
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Don't forget to keep checking www.Clickteam.com and
http://community.clickteam.com for more Physics examples, tutorials and more of
these PDF guides for some Hands-On Fusion 2.5 Magic!

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