

Objects in Simmetry 3d

This tutorial demonstrates how three dimensional objects may be placed into Simmetry3d scenes and how they can then be positioned and altered by the user.

Concepts

In this tutorial you will learn about:

- Importing 3d Objects in Simmetry 3d scenes
- Mesh Library
- Object Selection
- Moving, Rotating and Scaling Objects
- Object Properties
- How 3d Objects link to the terrain
- Painting multiple objects
- Remove Objects from the scene

Prerequisites

- Introduction to Simmetry3d Tutorial
- Terrain Editing

Import 3d Objects in Simmetry 3d scenes

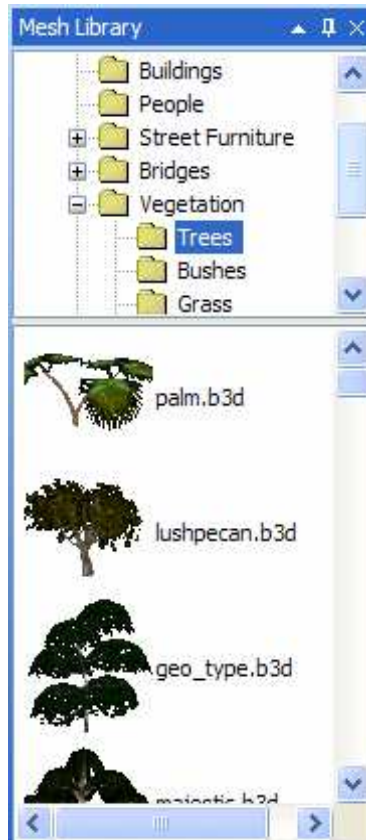
Three dimensional objects in Simmetry 3d are referred to as *meshes*. They are normally from files created in standard 3d modelling packages, such as 3D Studio Max or Sketchup and imported into Simmetry 3d.

There are several ways of introducing a mesh into a scene, which are as follows:

- Add from the Mesh Library
- Import directly from a file

Mesh Library

The mesh library is a collection of pre-prepared 3d objects that are available to drag and drop straight into the current scene. Access to the collection is through the Mesh Library panel in the designer.

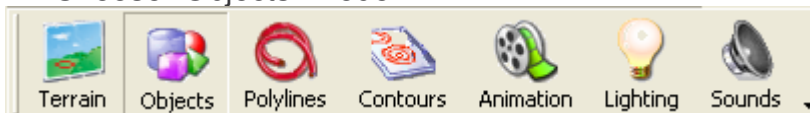


The top section of the Mesh Library allows users to group objects into logical collections and groups may contain other groups to further sub-categorise.

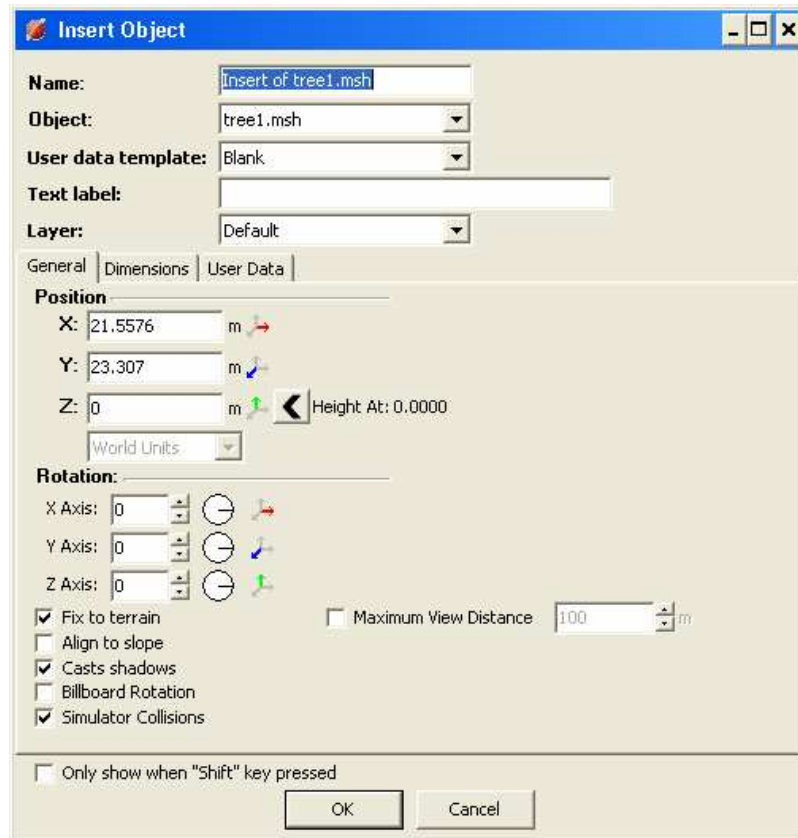
The bottom section displays a list of meshes in the highlighted group. To make it easier to remember which item is which there is a preview image of the mesh also displayed.

EXERCISE 1

- Load "Objects\Ex1.s3d"
- Choose "Objects" mode:



- Select the Vegetation group in the mesh library, then select the Trees subgroup
- Find the mesh called tree1
- Click the left mouse button on the tree
- While holding the mouse button down, move the mouse on to grass area in the centre of the terrain
- Release the mouse button
- You will see the following dialog appear:



- Move to the Dimensions Tab and set the Height of the object to 5 metres.
- Click the “OK” button and the tree will appear on the terrain



Import directly from a file

You may also introduce objects to the scene from an external file. Although not every file will import Simmetry 3d handles the most common 3d object file formats and will also maintain links to this file, so that if you alter it outside of Simmetry 3d it is easy to update the changes in your project.

EXERCISE 2

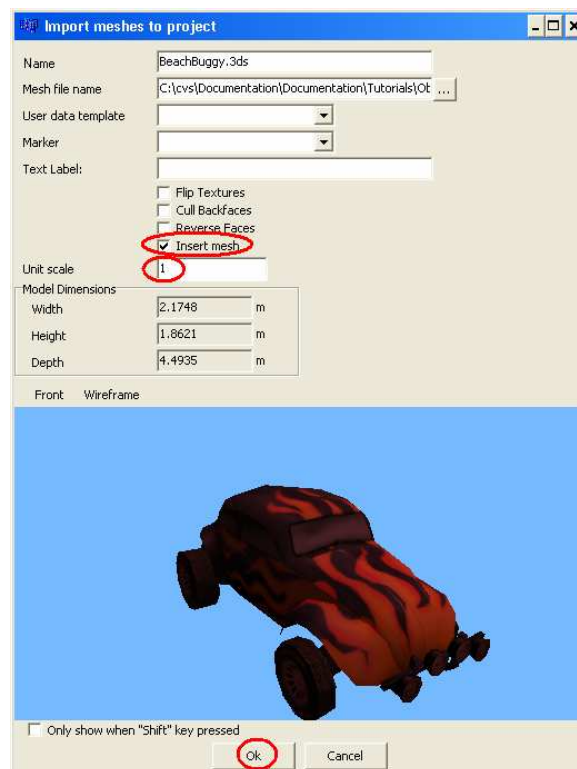
- Choose “Objects” mode:



- Go to the Project Tree and right click on the Meshes Item and choose the “Add Mesh” option

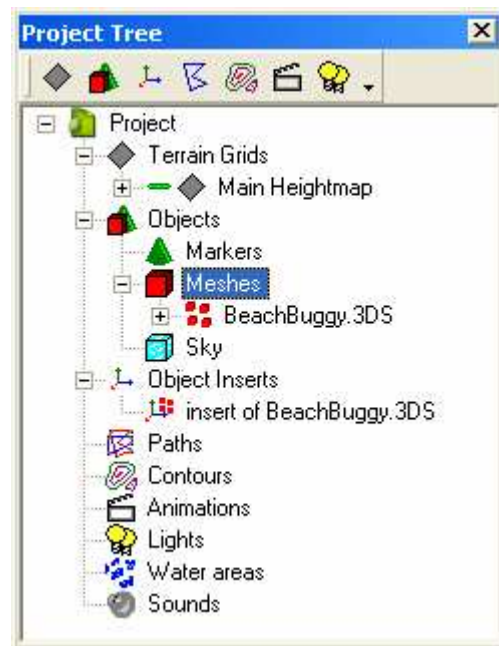


- In the file load dialog, select the “Objects\BeachBuggy.3ds” file and press “Open”



- You can move the camera around the previewed mesh by holding the left mouse button and moving the mouse.

- Choose “Insert mesh” Press the “Ok” button to import the mesh into the current project



Now you will see the beachBuggy.3ds listed in the list of Meshes in the current project in the Project Tree. Also you will see an insert of the mesh in the “Object Inserts” part of the project tree; imported objects are inserted in front of the camera, and if possible on the terrain. If you had turned off the “Insert mesh” option then you would just see the mesh in the project tree, but no insert.

An “object insert” is a single instance of the mesh. Each mesh in a scene may have multiple “object inserts” that link to it.

This lets you re-use the information from one mesh multiple times in the same scene. So if we have a tree mesh we can “insert” this same tree several times to save importing it every time we need another tree.

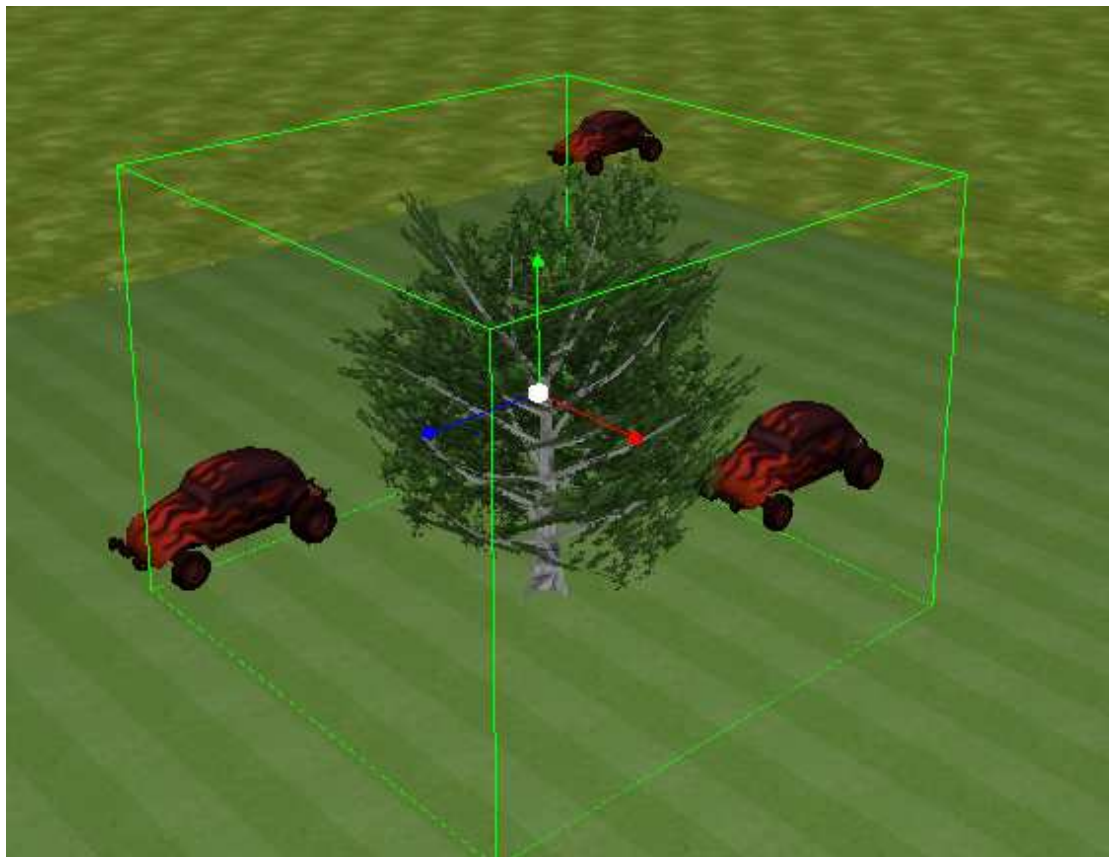
- Left Click on “BeachBuggy.3ds” mesh item, keep the mouse button held down
- Move the mouse over the terrain where you wish the beach buggy to appear and release the mouse
- Make sure the dimensions are correct and press the Ok button
- Add another palm tree, by left-clicking on “palm.s3d” mesh item
- Keep the left button held and move the mouse over the terrain where you wish the palm to appear and release the mouse.
- Make sure the dimensions are correct (height of 1.8m) and press the Ok button

You will see as you add inserts to the terrain they also appear under the Object Inserts in the Project Tree.

Object Selection

As you have seen you can select part of the terrain with the terrain selection tools and in a similar way you can select a set of the object inserts in the scene to work on without affecting unselected objects. A selected object is highlighted by a green cube that surrounds the object.


All the interactive mesh tools allow to select meshes in the same manner



EXERCISE 3

- Find the Object Tool bar



- Run the Object Selection Tool 
- Press the "Select All" tool option
- Press the "Select None" tool option

- Click the left mouse button on the beach buggy in the scene to select it manually
- Click and hold the left mouse button, then move the mouse to select multiple objects at once

Moving, Rotating and Scaling Objects

Objects are positioned in three dimensional space by specifying a position in X, Y and Z.

The origin of the scene (0,0,0) starts at the top left corner of the terrain. You can see the current position of the mouse cursor in world co-ordinates in the status bar.

The X axis specifies how far east/west, looking from the top view, from the origin you are.



The Y axis specifies how far north/south, looking from the top view, from the origin you are.






The Z axis specifies how far above the terrain you are. This is the height of the object

When an object or objects are selected you will see a “axis control” appear. It has three arrows, one green, one blue and one red. Simmetry3d allows objects to be moved, rotated and scaled interactively by using this “axis control”. The Green arrow represents the Z axis. The blue arrow represents the Y axis and the red arrow represents the X axis.


If you have more than one object selected the “axis control” appears at middle point in 3d space of the selected objects.

EXERCISE 4

- Load the “objects/ex4.s3d” project
- Change to the  Vertical Twin Camera View
- Press the first arrow from the left on the status bar and select “World Units”
- Run the Object Move Tool 
- Make the top view the active Viewport and select the beach buggy
- Click and hold on the Blue arrow. Move the object in the Y axis by moving the mouse
- Make the Perspective view active, and try and move the object “up” by clicking on the green arrow(Z axis). Simmetry will not let you – the object is “fixed to terrain”. Hold the shift key down and try again – the buggy will now move up and down.
- Repeat using the Red arrow (X axis)


- Press the “XY” tool option button on the tool options bar
- Click on the beach buggy and move the object in both the X and Y axis.
- Run the Object Selection Tool 
- Press the “Select All” tool option
- Run the Object Move Tool 
- Try moving all the objects at once
- Run the scale tool 
- Select beach buggy object
- Left click on any axis arrow on the axis control and move the mouse to scale the object
- Double the size of the buggy by entering 2 into the “delta” tool option and press the “Apply” button
- Half the size of the object by entering 0.5 into the “delta” tool option and press the “Apply” button
- Change to the Single Camera View 
- Run the Rotate Tool 
- Select the beach buggy
- Left click on the Green arrow and move the mouse, rotating the object around the Y axis

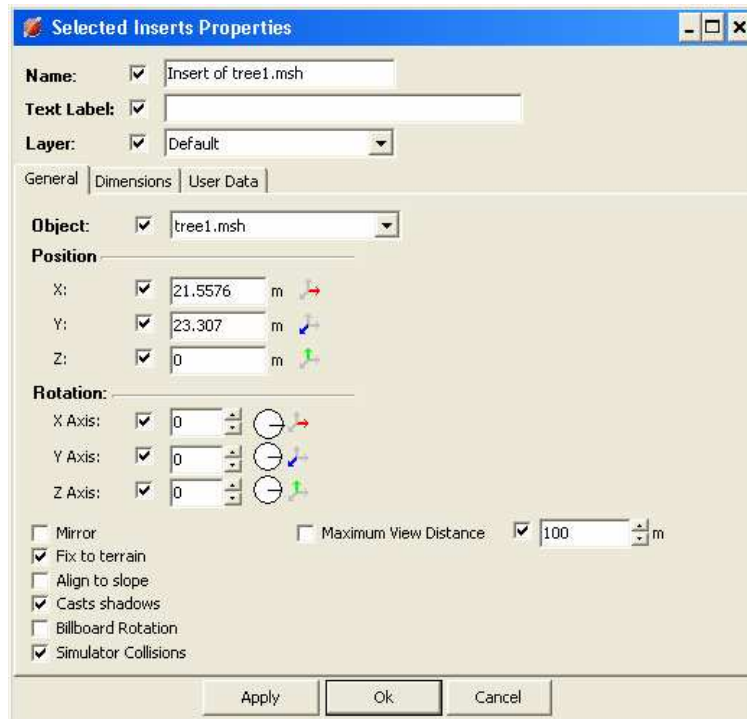
Object Properties

Each object insert has a series of properties that control the position, size and so on. These can be accessed by selecting a object and activating the “Selected Properties” tool . These can be altered interactively. The same options can also be found by right-clicking on the object insert item in the Project Tree and selecting the “Properties” option

If you select multiple objects the dialog will show the properties common to them all.

EXERCISE 5

- Select the tree object
- Activate the Selected Properties tool 



- Move the window so you can see the tree in the 3d view
- Change the Z-rotation to 40 and press the “Apply Button”
- Alternatively the properties of individual inserts can be changed by pointing the mouse cursor at the object in the 3d view, right clicking and choosing “Insert Properties”. Also you can find the insert’s node in the Project Tree and right click and choose “Insert Properties”.

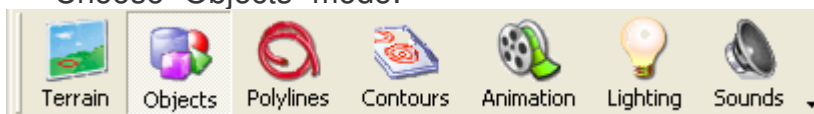
How 3d Objects link to the terrain

The objects on the terrain will maintain their position relative to the terrain even when you alter the terrain. If you wish to override this behaviour, select the object insert and unset the “Fix To Terrain” option.

When moving an object, if the “Align to Terrain” option is set then the object will alter its rotation to be perpendicular to the slope where it is positioned.

EXERCISE 6

- Choose “Objects” mode:



- Select the Beach Buggy object
- Choose “Terrain” mode:



- Start the Build Tool
- Build some terrain underneath the beach buggy, then change back to Objects mode.
- Run the Object Move Tool
- Move the beach buggy around in XY mode and see how it maintains its position above the terrain
- Activate the Selected Properties tool
- Press the “Ok” button
- Run the Object Move Tool
- Move the beach buggy around in XY mode to see how it will stay at the same height in Z and will go “under” terrain and float in the air
- Activate the Selected Properties tool
- Turn “Fix to terrain” back on and set the “Align to Slope” option
- Move the beach buggy around in XY mode to see will alter based on the slope it is on
- Remember you can adjust the height of an object above the terrain by holding the shift key down.

Remove Objects from the scene

If you wish to remove an object from a scene, the quickest way is to select it and then run the Delete Selected Tool

This tool will delete all currently selected objects.

You can also remove an insert by finding the appropriate object insert item in the Project Tree, right-clicking and selecting the “Remove” option. (Or press the “Delete” key).

Once all the inserts of an mesh are removed from the scene you are free to remove the Mesh from the Meshes item in the Project Tree.

EXERCISE 7

- Select the Beach Buggy object
- Run the Delete Selected Tool
- Make sure there are no more Beach Buggy object inserts in the scene
- Right-Click on the “BeachBuggy.3DS” item under the Meshes item in the Project Tree and select the “Remove” option

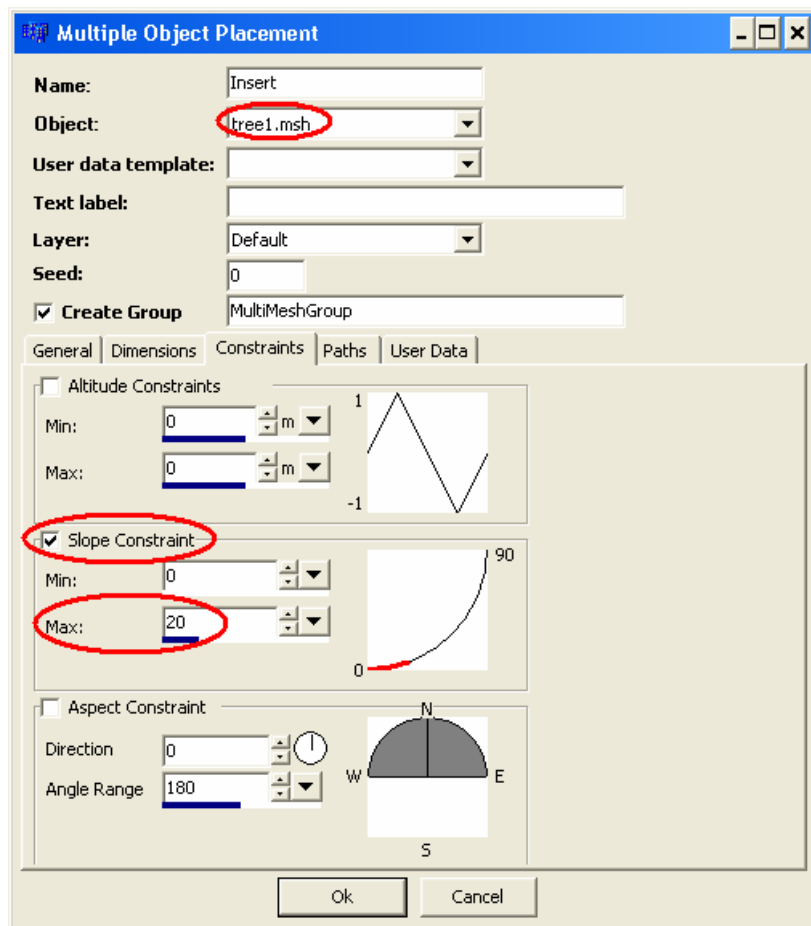
Advanced Options

One way to quickly add multiple copies of an object is to use the “Paint Inserts” tool. This is useful if you wish to quickly make a forest of trees, for example. The tool provides a series of constraints which control how the objects will be generated on the terrain.


To activate the “Paint Inserts” tool, right-click on the Object Inserts item in the Project Tree.

- Run the Paint Inserts Tool
- Set the Object option to be “tree1.msh”
- Set the Rotation Variance Z to be “180”


- Change to the Dimensions Tab
- Set the height to be 5m
- Set the scale Variance to be 25%
- Press the “Ok” button
- Left click on the terrain to “paint” palm tree object inserts on to the terrain
- Use the Undo (Control + Z) to remove the inserts
- Try using the Terrain Selection to constrain the painting to a particular area.




- Press the “Change Settings...” tool option and try setting up a slope constraint on Constraints Tab in the Multiple Object Placement settings so the palms will not appear on slopes above 20 degrees

Try the Copy Selected tool  that allows you to create a copy of the selected objects instantly.

- Run the Move tool
- Select an object
- Press the Copy Selected tool
- The newly copied object is now selected and you may move it with the mouse

Try out the Level Under tool  to set the terrain to be flat underneath the selected object. Select the objects you want to level underneath and then run the Level Under Tool. Press the “Level Beneath” option to alter the terrain.

Run the Snap to Terrain Tool . This will set the selected object’s height so that it is exactly on the terrain.

Try making one insert a “child” of another by dragging and dropping one insert item in the Project Tree on to another. Try moving the parent and see how it affects the children

Explore the Create Group right click option on the Object Insert node. This makes a convenient holder for grouping together objects

Create a multi-mesh group that allows you to populate the terrain with a particular mesh quickly. Use the terrain selection to limit the multi-mesh group to a particular area.

Try adding another multi-mesh group with a different mesh associated with it as a child of the first multi-mesh group to add different objects into the generated objects