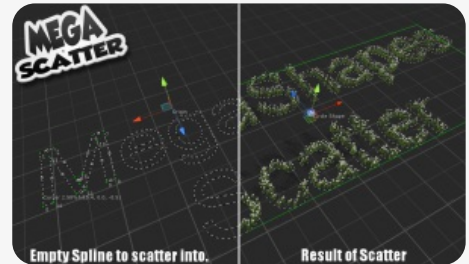


# MEGASCATTER



## Introduction

MegaScatter is a system that allows you to scatter multiple objects into regions of your scene either defined by spline shapes with the option to scatter either inside the closed spline shapes or to scatter along a spline. Or you can scatter objects via an overlaid texture where different colors can be assigned to scatter different object types and a second texture can be used to control the size of the object. Each object can have a weight for how often it will appear as well as random factors for scaling, rotation etc. You can ask the system to either scatter the objects as new objects in the scene or combine the objects into single meshes for massively reduced draw calls and increased performance. There is also the option to have the objects be scattered at runtime this means you can greatly reduce the size of your game and reduce loading times.



## Faster Games, Less Memory

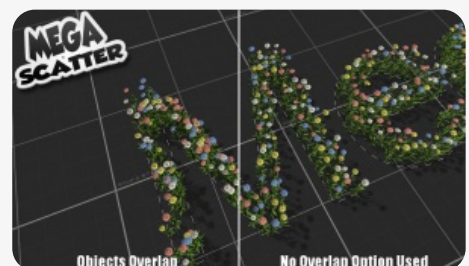
One of the key advantages to making use of a procedural scattering system that can be used at runtime as well as in Editor mode is the big reductions in file sizes and loading times you can benefit from. For example the demo scene seen in the video on this page and images had a file size of 44MB when built the normal way with the objects scattered into the scene and the game built. But with the objects deleted and the system told to use the same values to scatter the scene at startup the file size was reduced to 10MB, and with scattering you could have loads of different scenarios and choose which one to choose when the game starts, so you could have four scatter scenarios setup one for each season of the year, so normally that could potentially be one scene file of 150MB plus with loads of objects hidden or 4 different scenes to maintain each 40MB plus. With MegaScatter you can have all four seasons with next to no memory usage in one scene file of 10MB.



The other advantage to using a scatter system is the reduction in draw calls, again for the scene in the video the draw call count when the scene was built without MegaScatter was over 10,000 due to high number of objects in the scene, with the mesh combining system used by MegaScatter the scattered scene only uses 250 draw calls, another big performance saving.

## Scatter Controls

You can add as many MegaScatter objects as you like to your scene and each object can scatter any number of different objects to the scene, this makes it easy to set-up scatter objects for say different platforms or detail settings in the same scene. The scattering can either be done in the Editor or the system can be told to do the scattering at start-up, this means very detailed scenes can be set-up that use no memory until the scene is run, this massively reduces your game file size and hugely reduces loading times for scenes.

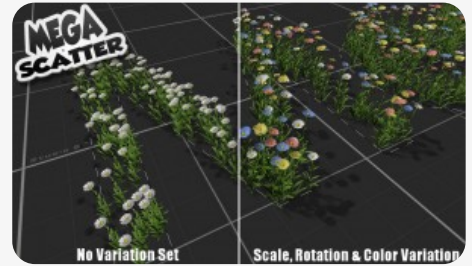


MegaScatter objects can also be told upon which objects the scattered objects can be placed as well as being told which objects they should not appear on or near so for example in a scene that already contains objects such as houses and walls you can tell each scatter object to ignore areas covered by existing objects in the scene via a user defined list. And you can off course control whether the objects being scattered can overlap themselves or objects previously scattered by the object.

You can at any time change the Density or Count values for the scatter objects and re scatter so again you can easily adjust the detail your scenes have depending on the platform and CPU power of the system running your game. Each scatter object has dozens of options to control how it is scattered in the scene, there are controls to limit the slope the object can appear on, or controls for the height range in the scene the object can appear in.

## Variations

As well as saving many hours over the normal manual positioning or painting of objects into a scene the MegaScatter system allows for variations in the objects to automatically handled so you can define random rotation and scaling factors on all axis, as well as if the object should align to any surface it is to be scattered on. And color variations can also be applied so if you are scattering say a rock mesh in your scene you can easily set-up any number of different colors that rock can be when it is scattered. There is also an option to add noise to the vertices of the meshes being scattered so making sure each instance of the object is unique looking.



## Constraints

To further fine tune and control your scattering there are various constraints you can define for each scatter layer such options as Snap values for position and rotation angle if you need things a little less random. You can also define a slope angle limit so that you can have grass only appear on relatively flat areas and rocky outcrops on steep slopes. And also a height option to again limit the area of any scattering for a layer to between two height values, so that makes it easier to use a single spline shape and have it filled with different plants, trees rocks etc and control that grass stops as trees begin and rocks only start to appear higher up.



## Advanced Settings

The scatter system is very simple and easy to use but it does also offer a lot of control over some of the finer points of the scattering process to make getting the result you need easier. Such things as control how much objects will align themselves to the ground, so plants you may not want to align at all but rocks or items with flat bottoms you may want to align correctly. Also when scattering around objects that you don't want your meshes to appear on you can control the distance from such objects that a mesh will be scattered, useful to stop poking through with plants against walls, or for just leaving a clear area around a house or road. Another feature is the ability to stop scattered meshes overhanging the edge of an object which can look unnatural. And finally when scattering a lot of the same mesh and the variations are not offering enough difference there is a vertex noise option to allow you to have a unique mesh shape for every scattered item.



## Scripting

You can also control the behaviour of the scattering from script and at runtime, this allows you to easily enable and disable layers so changing trees or plants from spring mode to winter becomes easy, or changing the weight or count of each scatter layer to adjust for CPU or platform or some game event. And it is important to note that with the scatter system you can have dozens of scatter scenarios or even hundreds for next to no extra memory use so bringing massive variety to your game levels without the authoring time, memory use or load time issues.



## Splines

MegaScatter comes complete with the basic version of MegaShapes which is our advanced Bezier spline system which allows you to easily build splines in your scenes not just for the scatter system but also can be used for camera paths etc. MegaShapes also has options to turn the splines into meshes in numerous ways either filling in the shape and extruding it or extruding along the length of the spline to form tubes or box tubes. MegaShapes can also import SVG files and also available are exporters for 3DS Max and Maya that allow splines built in those packages to be imported directly into Unity.

## Video

Video of a simple scene created with MegaScatter, it took only a few minutes to lay out the splines and then populate all the plants and rocks in the scene below.

**All the meshes are combined to greatly reduce draw calls, or they can be kept as objects if required**





# MEGASCATTER MESH



This scatter object allows for multiple mesh objects to be scattered inside closed splines. The meshes will be combined into new meshes so reducing draw calls and improving performance. There are controls to control how many objects and which type the object will scatter, the areas to scatter to and the variations for each object scattered in to the scene.

## How to Use

To add a MegaScatter mesh object to your scene you just need to go to the GameObject menu and then 'Create Other/MegaScatter' and select 'Scatter Mesh'. A Scatter mesh object will be added to your scene and named 'Scatter Mesh'. In the inspector you will see an option to select a 'Shape' this is where you select the MegaShape object in the scene that defines the regions in which you wish to scatter the objects. This shape should hold one or more closed splines, you can define which curves the system will scatter in so if you have a Shape object with dozens of splines you will be able to select which splines to use by opening the 'Show Splines' section in the inspector and un checking or checking the box for each spline. You can also set the start and end curve values in the inspector.

Once a shape has been selected you can set the mode in which the scatter count is calculated either it can be a pure count value or the scatter can be controlled via a Density value. The count mode is the easiest to use as you just set the total number of objects off all type you want the system to scatter and thats it. With the density mode the system will calculate how many objects to scatter based on the area of the spline shapes to be filled and the area of the objects to be scattered in that area. It is advised to start with the Count mode as depending on the import settings for meshes etc a high density value with tiny meshes can lead to 1000's of objects being scattered which could take a while, so it is best to setup the scatter with the Count mode and then if the Density mode is required switch to that and set the value at the end.

Now we can start to add the objects we want to scatter,

Below is a break down of all the controls available to you with the MegaScatter Mesh component. Clicking the 'Add Mesh' button will add a new object to the list of objects to scatter. When added the inspector will show all the options to control how this mesh is to be added to the scene, first thing to do is to name the layer and select the object to scatter by clicking the 'Object' option in the inspector and selecting a mesh based object such as a rock. Clicking the green 'Update' button will now scatter that object to the scene and you should see it appear. Once you have the object appearing in the scene you can go ahead and start tweaking all the various options to control how and where the objects are scattered. Below you will find a complete description of each option and what effect it has on the scattering process.

## Scatter Mesh Params

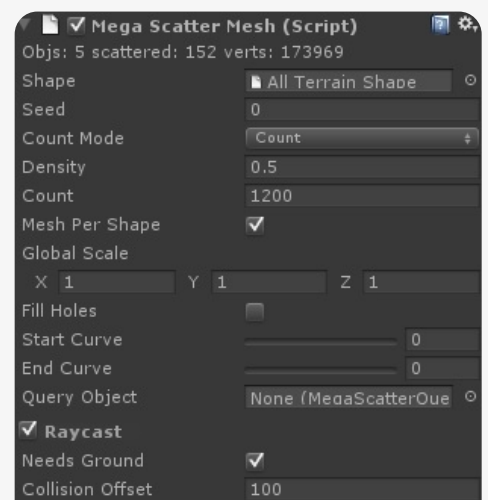
These options control the general behaviour of the scatter and will effect all the meshes that are scattered.

### Info

The top label shows how many objects have been created by the scatter, how many objects were actually scattered and the number of vertices that were created.

### Shape

The MegaShape spline object that holds the closed splines that will define the areas the objects will be scattered into. If a shape has some splines that are open they will not be taken into account. To scatter



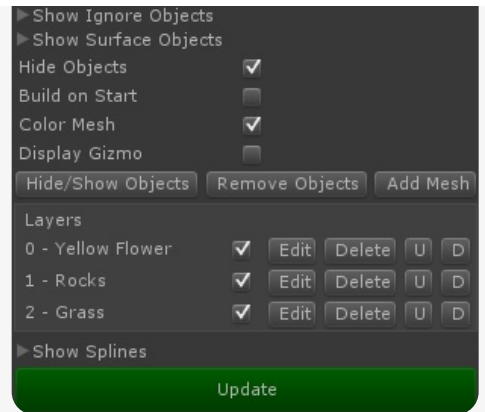
using open splines the Scatter Along object types should be used.

### **Seed**

The random number seed to use for general scatter random values. Each mesh layer has its own seed value as well for more control.

### **Count Mode**

The mode used to control how many objects will be scattered in the scene. If Count mode is selected then the count value below will control how many objects will be scattered. If density mode is chosen the the density value along with the area of the splines and objects to be scattered will be used in the calculation. It is best to start with Count mode.



### **Density**

The Density of meshes to be scattered, the higher the value the more objects will scattered. The area of the splines along with the area of each mesh is taken into account when calculating the count, so changing the scale values of the meshes etc will change the number of objects scattered. Be careful if you have very small values and high density values as it could lead to a lot of objects being scattered.

### **Count**

The number of objects to scatter in Count mode. Note this is the maximum number that will be scattered in some cases the system may run out room to scatter the meshes into if you have no overlap on in which case you may not get the exact number of objects added.

### **Mesh Per Shape**

If the selected shape has multiple splines you can ask the system to create a new mesh for each shape instead of combining to one large area, so it is possible to control the culling etc better for large areas by defining multiple splines instead of one big area.

### **Global Scale**

A scale value that will be applied to the whole scatter object, makes it easy to adjust the size of everything instead of scaling each object layer.

### **Fill Holes**

If you shape has closed splines inside other closed splines you tell the system to fill those as well, otherwise the system will use those as holes and not fill those areas.

### **Start Curve**

The first curve in the shape object to use for scattering in shapes with multiple splines.

### **End Curve**

The last curve to use for scattering in shapes with multiple splines.

### **Query Object**

Unused at the moment but in future updates you can use a custom class to write your own scattering rules etc for custom scattering.

### **Raycast**

Tells the system that the scattered objects should be positioned on top of selected colliders. With this mode on you will need to add the objects you wish to scatter on by opening the Shows Surface Objects section below.

### **Needs Ground**

If raycast is on setting this means the scatter system must find a surface object for each scattered object, if not checked and no surface found the object will be added at the height of the shape.

### **Collision Offset**

Offset above the object to start the raycast from, this usually does not need to be changed.

### **Show Ignore Objects**

This will open the section where you can define which objects the system should not scatter on or near, see below.

### **Show Surface Objects**

This opens the section where you can define the objects that can be scattered on, see below.

### Hide Objects

When you update the scatter objects will be added to the scene, this could be a lot of objects and you may not want them showing up in the hierarchy etc, checking this will hide any created objects from the project hierarchy.

### Build On Start

Check this to have the system scatter the objects when the scene is started. You would normally test the scatter in the editor and then click the Remove Objects button before building the scene and having this option checked for the scatter to be recreated at start greatly reducing file sizes and load times.

### Color Mesh

You can ask the system to color the meshes in a way that means they can be moved by suitable shaders for effects like blowing in the wind. This mode also needs to be turned on if you want the system to change the vertex colors to use the color variation options below.

### Display Gizmo

Shows the various gizmos for the object such as the height limits.

### Hide/Show Objects

This will turn off and on all the objects that were scattered, this makes it easy to disable the generated scatter objects to make the scene less cluttered in edit mode or just to disable areas that can be turned on later such as rubble scatters for destroyed buildings.

### Remove Objects

This will remove all the scatter objects that were created.

### Add Mesh

Clicking this will add a new object to be scattered by this object.

### Layers

Shows the current layers the object will scatter, you can disable layers here as well as deleting or changing the scatter order.

### Edit

To edit the params for the layer click the Edit button this will then show the params for that layer in the inspector.

### Delete

Delete the mesh from the scatter layers.

### U

If you have no overlap set then the order the meshes are scattered will have an effect on the scene, usually it is best to have the layer with the lowest weight or more important to the scatter first going to less important. Clicking this will move the layer up one in the list.

### D

As above but will move the layer down the list.

### Show Splines

If you open this section you can select the splines that are to be included in the scatter.

### Update

Click the green update button to re scatter the objects in the scene.

## Ignore Objects

This section controls which objects are ignored from the scattering raycast tests.

### Object Select

You can pick any object in the scene with a collider attached to be used as a ignore object.

### Delete

Delete the object from the ignore list.

## Surface Objects



Show Surface Objects

This section controls which objects are to be scattered on.

### Object Select

You can pick any object in the scene with a collider attached to be used as a surface object.

### Delete

Delete the object from the surface list.

## Splines

In this section you can control which splines are used by the scattering object. You just need to check and uncheck the box for each spline depending on whether you want it included or not.

## Mesh Layer Params

This is where you can control the scattering for each layer in the object, you have complete control over how each layer of the scatter behaves by changing the params in this section.

### Name

Name for the layer.

### Enabled

Whether or not this layer is to be included in the scatter.

### Mark Static

Mark any object generated for this layer to be marked as static in the scene.

### Object

The object mesh that will be scattered into the scene. This should currently be a single object, ie no children. Only the mesh data will be scattered any other components attached to the object will be ignored, if you need that then you should use the Scatter Object version.

### Counts Per Curve

You can override the count value and say that the count for this layer should be per spline in the shape as opposed to the count being split across all the splines.

### Force Count

Again you can override any count with this value this will force the scatter system to scatter this many objects (unless it is higher than Max Count) regardless of the weight value or other settings. Set to 0 for no force count to be used.

### Max Count

This will limit the number of objects scattered. Set to 0 for no limit to be used.

### Weight

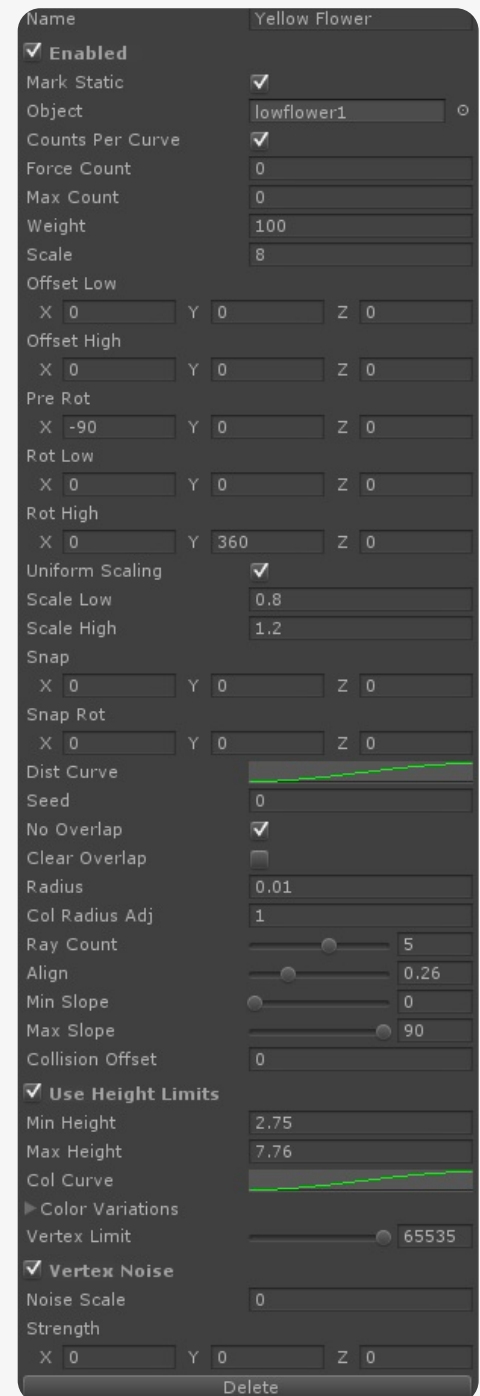
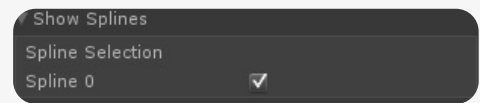
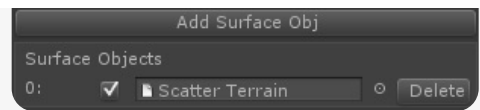
How much this layer will contribute to the total scatter count, the lower the value the less of the object will be scattered.

### Scale

Amount to scale the mesh by, this is useful for source meshes that have different sizes, you can easily get them to match by changing this value.

### Offset Low

A random offset can be added to each object before it is added, this is the low limit of the offset to use.



### **Offset High**

A random offset can be added to each object before it is added, this is the high limit of the offset to use.

### **Pre Rot**

It may be required that the mesh needs to be pre rotated before it is scattered to the scene, change this if your scattered objects are not in the correct orientation by default.

### **Rot Low**

A random rotation can be added to each object before it is added, this is the low limit of the rotation to use.

### **Rot High**

A random rotation can be added to each object before it is added, this is the high limit of the rotation to use.

### **Uniform Scaling**

For random scaling you can tell the system to randomly scale the object in a uniform if so check this, the scaling values below will be limited to a single value which will be used for all axis.

### **Scale Low**

A random scaling can be added to each object before it is added, this is the low limit of the scaling to use.

### **Scale High**

A random scaling can be added to each object before it is added, this is the high limit of the scaling to use.

### **Snap**

You can tell the system to snap any scattered object to these snap settings, use a 0 value for no snapping.

### **Snap Rot**

You can tell the system to snap any scattered objects rotation to these snap settings, use a 0 value for no snapping.

### **Dist Curve**

This curve will change how the random variations are defined. If it is a straight line from 0 to 1 then it will be an even random distribution, but if you want more variation towards the higher end you can adjust the curve to be steeper to one earlier etc.

### **Seed**

The seed value to use by the random number generator for this layer.

### **No Overlap**

By default the system will scatter objects not checking for whether it is overlapping a previously scattered object, if you check this the system will use the Radius value below to make sure it does not overlap other scattered objects.

### **Clear Overlap**

You can tell the system to clear the overlap table before scattering the layer by setting this.

### **Radius**

The radius of the object that is being scattered, used by the overlap system. This will be adjusted by any scaling values for you.

### **Col Radius Adj**

When the objects are being scattered they will check the ignore objects list to see if it is allowed to be scattered in that position, this value can be used to increase or decrease the radius of the check against these objects so you can make sure no object is scattered within that radius of the ignore object.

### **Ray Count**

When the system is checking for ignore objects it will use a multiple raycast, all those rays need to be clear of any object this will stop objects hanging over edges etc, the more rays used the more accurate the test will be.

### **Align**

Tells the system how much the object should be aligned to the surface it is scattered on, a value of 0 means no alignment will be done, a value of 1 means the object will totally align to the up value of the surface.



### Min Slope

You can control whether the object is scattered onto sloping areas, so you can easily scatter plants onto say only flat areas by setting the max slope value to a low value.

### Max Slope

The high limit for the slope the object can be scattered on.

### Collision Offset

Vertical offset to add to the mesh, this can be used to make sure objects sit nicely on the surface depending on where their pivot point is.

### Use Height Limits

Objects can also be limited to vertical zones of the surfaces, turn this on and two planes will be displayed that show the upper and lower limits of where this later can be scattered.

### Min Height

The lowest point past which the object will not be scattered.

### Max Height

The highest point past which the object will not be scattered.

### Col Curve

This curve is used to control the alpha value used in meshes, this alpha value could be used by shaders to control the amount a mesh is effected by wind etc. Using this curve you can control how stiff a plant is for its height etc.

### Color Variations

This sections shows the color variations section. See below.

### Vertex Limit

You can set the maximum vertices in a mesh before a new object is created in a scene. Usually you would leave this at a high value to reduce the number of objects generated but it maybe you want more objects to increase culling or obstruction checks etc if so reduce this value.

### Vertex Noise

If the scattered objects look too similar for you liking you can get the scatter system to add some vertex noise to each scattered mesh, so if you were scattering bricks you could make each one slightly different by turning this option on, same for plants etc.

### Noise Scale

How similar the noise is based on distance, higher values will give a more jaggy look to meshes.

### Strength

How much noise on each axis is added.

## Color Variations

If the color mesh option is on you can ask the system to change the vertex colors randomly with the colors you add here. This could be used to add different colored flowers to a scene from a single object source.

### Add Color

Add a new color to the variation list.

### Color

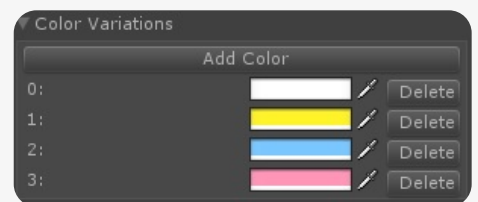
The color to be used.

### Delete

Delete the color from the list.

## Video Tutorial

(Coming Soon) Video showing creating a Scatter Mesh object.



## MEGASCATTER MESH ALONG



This scatter object allows for multiple mesh objects to be scattered along and around any splines. The meshes will be combined into new meshes so reducing draw calls and improving performance. There are controls to control how many objects and which type the object will scatter, the areas to scatter to and the variations for each object scattered in to the scene.

### How to Use

To add a MegaScatter Mesh Along object to your scene you just need to go to the GameObject menu and then 'Create Other/MegaScatter' and select 'Scatter Mesh Along'. A Scatter mesh object will be added to your scene and named 'Scatter Mesh'. In the inspector you will see an option to select a 'Shape' this is where you select the MegaShape object in the scene that defines the regions in which you wish to scatter the objects. This shape can contain 1 or more splines, you can define which curves the system will scatter in so if you have a Shape object with dozens of splines you will be able to select which splines to use by opening the 'Show Splines' section in the inspector and un checking or checking the box for each spline. You can also set the start and end curve values in the inspector.

Once a shape has been selected you can set the mode in which the scatter count is calculated either it can be a pure count value or the scatter can be controlled via a Density value. The count mode is the easiest to use as you just set the total number of objects of all type you want the system to scatter and that's it. With the density mode the system will calculate how many objects to scatter based on the area of the spline shapes to be filled and the area of the objects to be scattered in that area. It is advised to start with the Count mode as depending on the import settings for meshes etc a high density value with tiny meshes can lead to 1000's of objects being scattered which could take a while, so it is best to setup the scatter with the Count mode and then if the Density mode is required switch to that and set the value at the end.

Now we can start to add the objects we want to scatter,

Below is a break down of all the controls available to you with the MegaScatter Mesh component. Clicking the 'Add Mesh' button will add a new object to the list of objects to scatter. When added the inspector will show all the options to control how this mesh is to be added to the scene, first thing to do is to name the layer and select the object to scatter by clicking the 'Object' option in the inspector and selecting a mesh based object such as a rock. Clicking the green 'Update' button will now scatter that object to the scene and you should see it appear. Once you have the object appearing in the scene you can go ahead and start tweaking all the various options to control how and where the objects are scattered. Below you will find a complete description of each option and what effect it has on the scattering process.

### Scatter Mesh Params

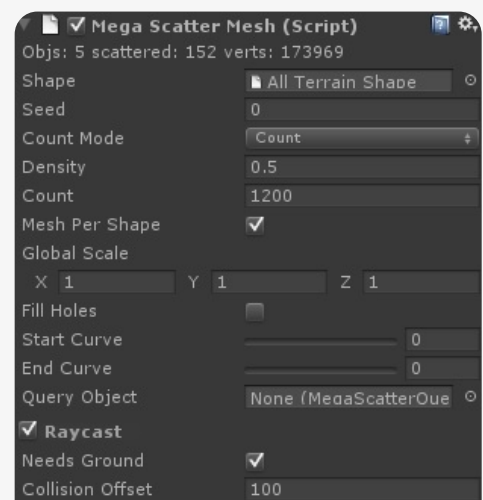
These options control the general behaviour of the scatter and will effect all the meshes that are scattered.

#### Info

The top label shows how many objects have been created by the scatter, how many objects were actually scattered and the number of vertices that were created.

#### Shape

The MegaShape spline object that holds the closed splines that will define the areas the objects will be scattered into. If a shape has some splines that are open they will not be taken into account. To scatter



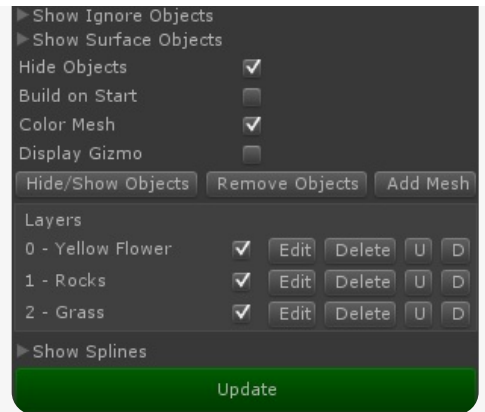
using open splines the Scatter Along object types should be used.

### **Seed**

The random number seed to use for general scatter random values. Each mesh layer has its own seed value as well for more control.

### **Count Mode**

The mode used to control how many objects will be scattered in the scene. If Count mode is selected then the count value below will control how many objects will be scattered. If density mode is chosen the the density value along with the area of the splines and objects to be scattered will be used in the calculation. It is best to start with Count mode.



### **Density**

The Density of meshes to be scattered, the higher the value the more objects will scattered. The area of the splines along with the area of each mesh is taken into account when calculating the count, so changing the scale values of the meshes etc will change the number of objects scattered. Be careful if you have very small values and high density values as it could lead to a lot of objects being scattered.

### **Count**

The number of objects to scatter in Count mode. Note this is the maximum number that will be scattered in some cases the system may run out room to scatter the meshes into if you have no overlap on in which case you may not get the exact number of objects added.

### **Mesh Per Shape**

If the selected shape has multiple splines you can ask the system to create a new mesh for each shape instead of combining to one large area, so it is possible to control the culling etc better for large areas by defining multiple splines instead of one big area.

### **Global Scale**

A scale value that will be applied to the whole scatter object, makes it easy to adjust the size of everything instead of scaling each object layer.

### **Start Curve**

The first curve in the shape object to use for scattering in shapes with multiple splines.

### **End Curve**

The last curve to use for scattering in shapes with multiple splines.

### **Query Object**

Unused at the moment but in future updates you can use a custom class to write your own scattering rules etc for custom scattering.

### **Raycast**

Tells the system that the scattered objects should be positioned on top of selected colliders. With this mode on you will need to add the objects you wish to scatter on by opening the Shows Surface Objects section below.

### **Needs Ground**

If raycast is on setting this means the scatter system must find a surface object for each scattered object, if not checked and no surface found the object will be added at the height of the shape.

### **Collision Offset**

Offset above the object to start the raycast from, this usually does not need to be changed.

### **Show Ignore Objects**

This will open the section where you can define which objects the system should not scatter on or near, see below.

### **Show Surface Objects**

This opens the section where you can define the objects that can be scattered on, see below.

### **Hide Objects**

When you update the scatter objects will be added to the scene, this could be a lot of objects and you may not want them showing up in the hierarchy etc, checking this will hide any created objects from the project

hierarchy.

### **Build On Start**

Check this to have the system scatter the objects when the scene is started. You would normally test the scatter in the editor and then click the Remove Objects button before building the scene and having this option checked for the scatter to be recreated at start greatly reducing file sizes and load times.

### **Color Mesh**

You can ask the system to color the meshes in a way that means they can be moved by suitable shaders for effects like blowing in the wind. This mode also needs to be turned on if you want the system to change the vertex colors to use the color variation options below.

### **Display Gizmo**

Shows the various gizmos for the object such as the height limits.

### **Hide/Show Objects**

This will turn off and on all the objects that were scattered, this makes it easy to disable the generated scatter objects to make the scene less cluttered in edit mode or just to disable areas that can be turned on later such as rubble scatters for destroyed buildings.

### **Remove Objects**

This will remove all the scatter objects that were created.

### **Add Mesh**

Clicking this will add a new object to be scattered by this object.

### **Layers**

Shows the current layers the object will scatter, you can disable layers here as well as deleting or changing the scatter order.

### **Edit**

To edit the params for the layer click the Edit button this will then show the params for that layer in the inspector.

### **Delete**

Delete the mesh from the scatter layers.

### **U**

If you have no overlap set then the order the meshes are scattered will have an effect on the scene, usually it is best to have the layer with the lowest weight or more important to the scatter first going to less important. Clicking this will move the layer up one in the list.

### **D**

As above but will move the layer down the list.

### **Show Splines**

If you open this section you can select the splines that are to be included in the scatter.

### **Update**

Click the green update button to re scatter the objects in the scene.

## **Ignore Objects**

This section controls which objects are ignored from the scattering raycast tests.

### **Object Select**

You can pick any object in the scene with a collider attached to be used as a ignore object.

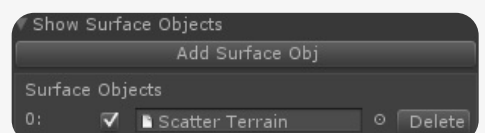
### **Delete**

Delete the object from the ignore list.

## **Surface Objects**

This section controls which objects are to be scattered on.

### **Object Select**



You can pick any object in the scene with a collider attached to be used as a surface object.

### Delete

Delete the object from the surface list.

## Splines

In this section you can control which splines are used by the scattering object. You just need to check and uncheck the box for each spline depending on whether you want it included or not.

Show Splines

Spline Selection

Spline 0



## Mesh Layer Params

This is where you can control the scattering for each layer in the object, you have complete control over how each layer of the scatter behaves by changing the params in this section.

### Name

Name for the layer.

### Enabled

Whether or not this layer is to be included in the scatter.

### Mark Static

Mark any object generated for this layer to be marked as static in the scene.

### Object

The object mesh that will be scattered into the scene. This should currently be a single object, ie no children. Only the mesh data will be scattered any other components attached to the object will be ignored, if you need that then you should use the Scatter Object version.

### Counts Per Curve

You can override the count value and say that the count for this layer should be per spline in the shape as opposed to the count being split across all the splines.

### Force Count

Again you can override any count with this value this will force the scatter system to scatter this many objects (unless it is higher than Max Count) regardless of the weight value or other settings. Set to 0 for no force count to be used.

### Max Count

This will limit the number of objects scattered. Set to 0 for no limit to be used.

### Weight

How much this layer will contribute to the total scatter count, the lower the value the less of the object will be scattered.

### Scale

Amount to scale the mesh by, this is useful for source meshes that have different sizes, you can easily get them to match by changing this value.

### Min Distance

How far away from the spline the scattering should start, 0 would be right on the spline. This allows you to scatter objects as a border around splines as well as along them.

### Max Distance

How far away from the spline the scattering should end, 0 would be right on the spline. This allows you to

Name	Rocks		
<input checked="" type="checkbox"/> Enabled			
Mark Static	<input checked="" type="checkbox"/>		
Object	RockMesh		
Force Count	0		
Max Count	100		
Weight	100		
Scale	1		
Min Distance	0		
Max Distance	0.1		
Scale on Dist			
Offset Low	X 0	Y 0	Z 0
Offset High	X 0	Y 0	Z 0
Pre Rot	X 0	Y 0	Z 0
Rot Low	X 0	Y 0	Z 0
Rot High	X 0	Y 0	Z 0
Uniform Scaling	<input checked="" type="checkbox"/>		
Scale Low	1		
Scale High	1		
Snap	X 0	Y 0	Z 0
Snap Rot	X 0	Y 0	Z 0
Dist Curve			
Seed	0		
No Overlap	<input type="checkbox"/>		
Clear Overlap	<input type="checkbox"/>		
Radius	0.1		
Col Radius Adj	1		
Ray Count			5
Align			0
Min Slope			0
Max Slope			90
Collision Offset	0		
<input type="checkbox"/> Use Height Limits			
Min Height	0		
Max Height	1		
Col Curve			
Color Variations			
Vertex Limit			65535
<input type="checkbox"/> Vertex Noise			
Noise Scale	0		
Strength	X 0	Y 0	Z 0
Delete			



scatter objects as a border around splines as well as along them.

### ***Scale on Dist***

With this curve you can control the scale of the object that is being scattered based on its distance between the min and max distance values.

### ***Offset Low***

A random offset can be added to each object before it is added, this is the low limit of the offset to use.

### ***Offset High***

A random offset can be added to each object before it is added, this is the high limit of the offset to use.

### ***Pre Rot***

It may be required that the mesh needs to be pre rotated before it is scattered to the scene, change this if your scattered objects are not in the correct orientation by default.

### ***Rot Low***

A random rotation can be added to each object before it is added, this is the low limit of the rotation to use.

### ***Rot High***

A random rotation can be added to each object before it is added, this is the high limit of the rotation to use.

### ***Uniform Scaling***

For random scaling you can tell the system to randomly scale the object in a uniform if so check this, the scaling values below will be limited to a single value which will be used for all axis.

### ***Scale Low***

A random scaling can be added to each object before it is added, this is the low limit of the scaling to use.

### ***Scale High***

A random scaling can be added to each object before it is added, this is the high limit of the scaling to use.

### ***Snap***

You can tell the system to snap any scattered object to these snap settings, use a 0 value for no snapping.

### ***Snap Rot***

You can tell the system to snap any scattered objects rotation to these snap settings, use a 0 value for no snapping.

### ***Dist Curve***

This curve will change how the random variations are defined. If it is a straight line from 0 to 1 then it will be an even random distribution, but if you want more variation towards the higher end you can adjust the curve to be steeper to one earlier etc.

### ***Seed***

The seed value to use by the random number generator for this layer.

### ***No Overlap***

By default the system will scatter objects not checking for whether it is overlapping a previously scattered object, if you check this the system will use the Radius value below to make sure it does not overlap other scattered objects.

### ***Clear Overlap***

You can tell the system to clear the overlap table before scattering the layer by setting this.

### ***Radius***

The radius of the object that is being scattered, used by the overlap system. This will be adjusted by any scaling values for you.

### ***Col Radius Adj***

When the objects are being scattered they will check the ignore objects list to see if it is allowed to be scattered in that position, this value can be used to increase or decrease the radius of the check against these objects so you can make sure no object is scattered within that radius of the ignore object.

### ***Ray Count***

When the system is checking for ignore objects it will use a multiple raycast, all those rays need to be clear of any object this will stop objects hanging over edges etc, the more rays used the more accurate the test will be.

### ***Align***

Tells the system how much the object should be aligned to the surface it is scattered on, a value of 0 means no alignment will be done, a value of 1 means the object will totally aligned to the up value of the surface.

### ***Min Slope***

You can control whether the object is scattered onto sloping areas, so you can easily scatter plants onto say only flat areas by setting the max slope value to a low value.

### ***Max Slope***

The high limit for the slope the object can be scattered on.

### ***Collision Offset***

Vertical offset to add to the mesh, this can be used to make sure objects sit nicely on the surface depending on where their pivot point is.

### ***Use Height Limits***

Objects can also be limited to vertical zones of the surfaces, turn this on and two planes will be displayed that show the upper and lower limits of where this later can be scattered.

### ***Min Height***

The lowest point past which the object will not be scattered.

### ***Max Height***

The highest point past which the object will not be scattered.

### ***Col Curve***

This curve is used to control the alpha value used in meshes, this alpha value could be used by shaders to control the amount a mesh is effected by wind etc. Using this curve you can control how stiff a plant is for its height etc.

### ***Color Variations***

This sections shows the color variations section. See below.

### ***Vertex Limit***

You can set the maximum vertices in a mesh before a new object is created in a scene. Usually you would leave this at a high value to reduce the number of objects generated but it maybe you want more objects to increase culling or obstruction checks etc if so reduce this value.

### ***Vertex Noise***

If the scattered objects look too similar for you liking you can get the scatter system to add some vertex noise to each scattered mesh, so if you were scattering bricks you could make each one slightly different by turning this option on, same for plants etc.

### ***Noise Scale***

How similar the noise is based on distance, higher values will give a more jaggy look to meshes.

### ***Strength***

How much noise on each axis is added.

## **Color Variations**

If the color mesh option is on you can ask the system to change the vertex colors randomly with the colors you add here. This could be used to add different colored flowers to a scene from a single object source.

### ***Add Color***

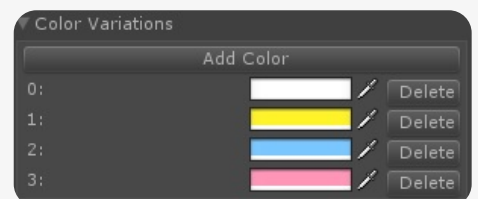
Add a new color to the variation list.

### ***Color***

The color to be used.

### ***Delete***

Delete the color from the list.



# MEGASCATTER MESH TEXTURE



This scatter object allows for multiple mesh objects to be scattered using colors on a source texture or textured object in the scene, multiple color masks can be defined per layer to give advanced control over where meshes appear and with the option for a second texture to control scaling of scattered objects you have even more control. The meshes will be combined into new meshes so reducing draw calls and improving performance. There are controls to control how many objects and which type the object will scatter, the areas to scatter to and the variations for each object scattered in to the scene.

## How to Use

To add a MegaScatter mesh object to your scene you just need to go to the GameObject menu and then 'Create Other/MegaScatter' and select 'Scatter Mesh Texture'. A Scatter mesh object will be added to your scene and named 'Scatter Mesh Texture'. In the inspector you will see an option to select a 'Texture' this is where you select any texture in your project as the scatter color texture where each color on the texture can be used to define a region for meshes to be scattered into. You can choose to select a textured object instead which in some cases can be easier as it is easier to visualize and control the positioning with a textured object. The object will require a collider and if using just the texture then that texture will need to be set to readable before it can be used. The Scatter Cols section in the layer inspector is where you define the color masks you want to use.

Once a texture or texture object has been selected you can set the mode in which the scatter count is calculated either it can be a pure count value or the scatter can be controlled via a Density value. The count mode is the easiest to use as you just set the total number of objects off all type you want the system to scatter and thats it. With the density mode the system will calculate how many objects to scatter based on the area of the spline shapes to be filled and the area of the objects to be scattered in that area. It is advised to start with the Count mode as depending on the import settings for meshes etc a high density value with tiny meshes can lead to 1000's of objects being scattered which could take a while, so it is best to setup the scatter with the Count mode and then if the Density mode is required switch to that and set the value at the end.

Now we can start to add the objects we want to scatter,

Below is a break down of all the controls available to you with the MegaScatter Mesh Texture component. Clicking the 'Add Mesh' button will add a new object to the list of objects to scatter. When added the inspector will show all the options to control how this mesh is to be added to the scene, first thing to do is to name the layer and select the object to scatter by clicking the 'Object' option in the inspector and selecting a mesh based object such as a rock. You will now need to setup the color masks to use for this layer. See the Scatter Cols section below for more on that. Clicking the green 'Update' button will now scatter that object to the scene and you should see it appear. Once you have the object appearing in the scene you can go ahead and start tweaking all the various options to control how and where the objects are scattered. Below you will find a complete description of each option and what effect it has on the scattering process.

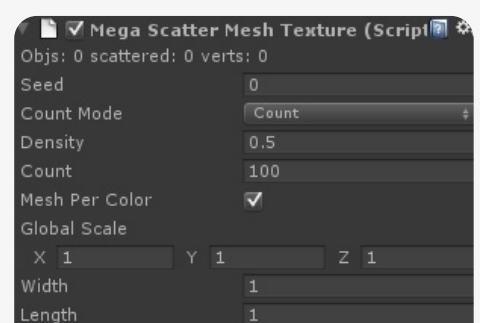
## Scatter Mesh Texture Params

These options control the general behaviour of the scatter and will effect all the meshes that are scattered.

### Info

The top label shows how many objects have been created by the scatter, how many objects were actually scattered and the number of vertices that were created.

### Seed



The random number seed to use for general scatter random values. Each mesh layer has its own seed value as well for more control.

### Count Mode

The mode used to control how many objects will be scattered in the scene. If Count mode is selected then the count value below will control how many objects will be scattered. If density mode is chosen the the density value along with the area of the splines and objects to be scattered will be used in the calculation. It is best to start with Count mode.

### Density

The Density of meshes to be scattered, the higher the value the more objects will scattered. The area of the splines along with the area of each mesh is taken into account when calculating the count, so changing the scale values of the meshes etc will change the number of objects scattered. Be careful if you have very small values and high density values as it could lead to a lot of objects being scattered.

### Count

The number of objects to scatter in Count mode. Note this is the maximum number that will be scattered in some cases the system may run out room to scatter the meshes into if you have no overlap on in which case you may not get the exact number of objects added.

### Mesh Per Color

If you have defined multiple color masks you can ask the system to create a new mesh for each shape instead of combining to one large area.

### Global Scale

A scale value that will be applied to the whole scatter object, makes it easy to adjust the size of everything instead of scaling each object layer.

### Width

If not using a textured object then this defines the width for area of scatter for object.

### Length

If not using a textured object then this defines the length for area of scatter for object.

### Texture

The texture map containing the colored regions to use to control the scatter.

### Scale

An optional texture to use to control the scaling of any objects scattered in the scene. The scaling is controlled by the red channel in this image.

### Min Scale

When using the scaling texture you can control the min and max scale value that are lerped between with the scaling color.

### Max Scale

When using the scaling texture you can control the min and max scale value that are lerped between with the scaling color.

### Min Size to Add

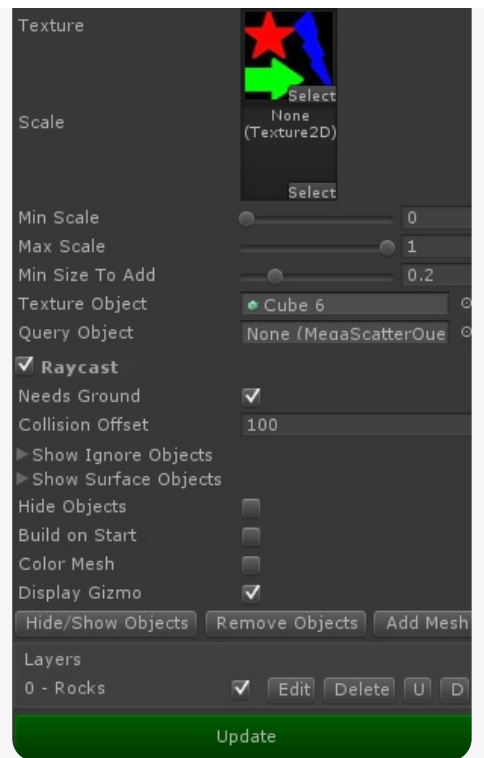
You can set a cut off scale value below which an object will not be scattered into the scene.

### Texture Object

Instead of using a texture and the width and length values to define the scatter area you can choose to use a textured object in the scene, the object must have a collider attached.

### Query Object

Unused at the moment but in future updates you can use a custom class to write your own scattering rules etc for custom scattering.



### **Raycast**

Tells the system that the scattered objects should be positioned on top of selected colliders. With this mode on you will need to add the objects you wish to scatter on by opening the Shows Surface Objects section below.

### **Needs Ground**

If raycast is on setting this means the scatter system must find a surface object for each scattered object, if not checked and no surface found the object will be added at the height of the shape.

### **Collision Offset**

Offset above the object to start the raycast from, this usually does not need to be changed.

### **Show Ignore Objects**

This will open the section where you can define which objects the system should not scatter on or near, see below.

### **Show Surface Objects**

This opens the section where you can define the objects that can be scattered on, see below.

### **Hide Objects**

When you update the scatter objects will be added to the scene, this could be a lot of objects and you may not want them showing up in the hierarchy etc, checking this will hide any created objects from the project hierarchy.

### **Build On Start**

Check this to have the system scatter the objects when the scene is started. You would normally test the scatter in the editor and then click the Remove Objects button before building the scene and having this option checked for the scatter to be recreated at start greatly reducing file sizes and load times.

### **Color Mesh**

You can ask the system to color the meshes in a way that means they can be moved by suitable shaders for effects like blowing in the wind. This mode also needs to be turned on if you want the system to change the vertex colors to use the color variation options below.

### **Display Gizmo**

Shows the various gizmos for the object such as the height limits.

### **Hide/Show Objects**

This will turn off and on all the objects that were scattered, this makes it easy to disable the generated scatter objects to make the scene less cluttered in edit mode or just to disable areas that can be turned on later such as rubble scatters for destroyed buildings.

### **Remove Objects**

This will remove all the scatter objects that were created.

### **Add Mesh**

Clicking this will add a new object to be scattered by this object.

### **Layers**

Shows the current layers the object will scatter, you can disable layers here as well as deleting or changing the scatter order.

### **Edit**

To edit the params for the layer click the Edit button this will then show the params for that layer in the inspector.

### **Delete**

Delete the mesh from the scatter layers.

### **U**

If you have no overlap set then the order the meshes are scattered will have an effect on the scene, usually it is best to have the layer with the lowest weight or more important to the scatter first going to less important. Clicking this will move the layer up one in the list.

### **D**

As above but will move the layer down the list.



## Show Splines

If you open this section you can select the splines that are to be included in the scatter.

## Update

Click the green update button to re scatter the objects in the scene.

## Ignore Objects

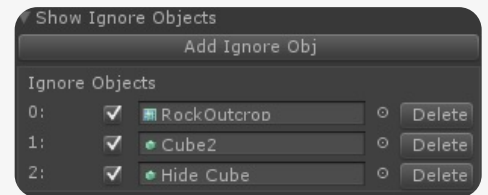
This section controls which objects are ignored from the scattering raycast tests.

### Object Select

You can pick any object in the scene with a collider attached to be used as a ignore object.

### Delete

Delete the object from the ignore list.



## Surface Objects

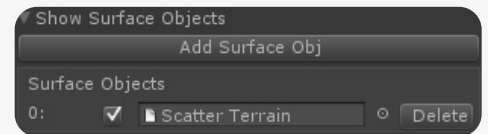
This section controls which objects are to be scattered on.

### Object Select

You can pick any object in the scene with a collider attached to be used as a surface object.

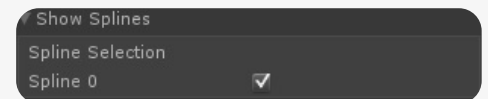
### Delete

Delete the object from the surface list.



## Splines

In this section you can control which splines are used by the scattering object. You just need to check and uncheck the box for each spline depending on whether you want it included or not.



## Mesh Layer Params

This is where you can control the scattering for each layer in the object, you have complete control over how each layer of the scatter behaves by changing the params in this section.

### Name

Name for the layer.

### Enabled

Whether or not this layer is to be included in the scatter.

### Mark Static

Mark any object generated for this layer to be marked as static in the scene.

### Add Color Mask

This is where you can add any number of color masks to be used by this layer. The system will check the scatter location on the texture and if the color found there is between the first and second color for any of these masks then the object will be scattered at that point.

### Color

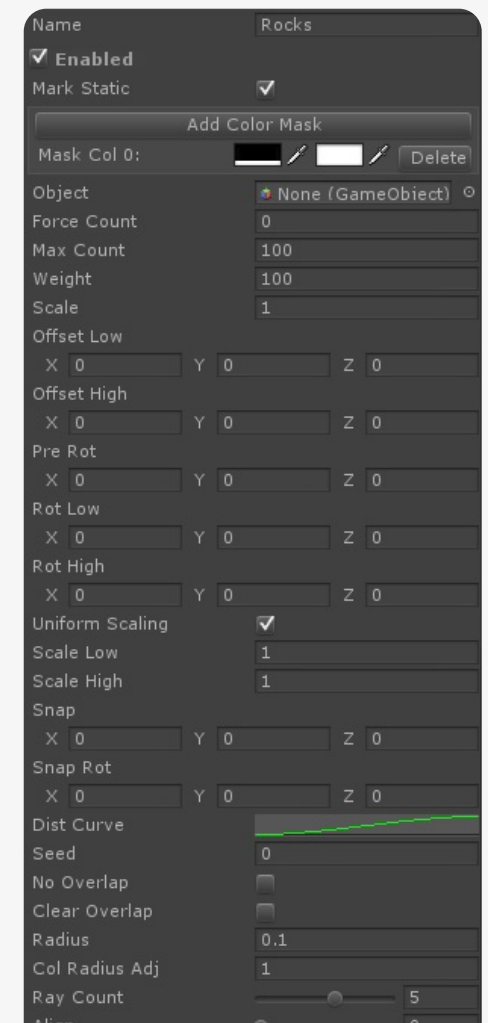
The low and high colors to use for this mask.

### Delete

You can delete a color mask by clicking this button.

### Object

The object mesh that will be scattered into the scene. This should currently be a single object, ie no children. Only the mesh data will be scattered any other



components attached to the object will be ignored, if you need that then you should use the Scatter Object version.

### **Counts Per Curve**

You can override the count value and say that the count for this layer should be per spline in the shape as opposed to the count being split across all the splines.

### **Force Count**

Again you can override any count with this value this will force the scatter system to scatter this many objects (unless it is higher than Max Count) regardless of the weight value or other settings. Set to 0 for no force count to be used.

### **Max Count**

This will limit the number of objects scattered. Set to 0 for no limit to be used.

### **Weight**

How much this layer will contribute to the total scatter count, the lower the value the less of the object will be scattered.

### **Scale**

Amount to scale the mesh by, this is useful for source meshes that have different sizes, you can easily get them to match by changing this value.

### **Offset Low**

A random offset can be added to each object before it is added, this is the low limit of the offset to use.

### **Offset High**

A random offset can be added to each object before it is added, this is the high limit of the offset to use.

### **Pre Rot**

It may be required that the mesh needs to be pre rotated before it is scattered to the scene, change this if your scattered objects are not in the correct orientation by default.

### **Rot Low**

A random rotation can be added to each object before it is added, this is the low limit of the rotation to use.

### **Rot High**

A random rotation can be added to each object before it is added, this is the high limit of the rotation to use.

### **Uniform Scaling**

For random scaling you can tell the system to randomly scale the object in a uniform if so check this, the scaling values below will be limited to a single value which will be used for all axis.

### **Scale Low**

A random scaling can be added to each object before it is added, this is the low limit of the scaling to use.

### **Scale High**

A random scaling can be added to each object before it is added, this is the high limit of the scaling to use.

### **Snap**

You can tell the system to snap any scattered object to these snap settings, use a 0 value for no snapping.

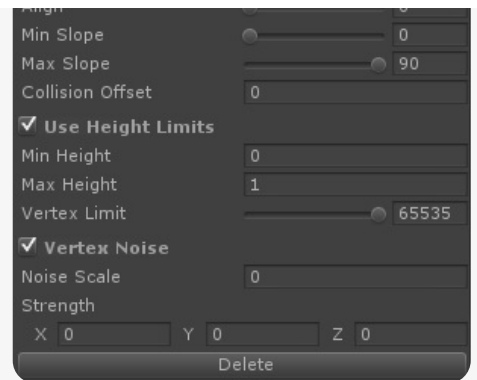
### **Snap Rot**

You can tell the system to snap any scattered objects rotation to these snap settings, use a 0 value for no snapping.

### **Dist Curve**

This curve will change how the random variations are defined. If it is a straight line from 0 to 1 then it will be an even random distribution, but if you want more variation towards the higher end you can adjust the curve to be steeper to one earlier etc.

### **Seed**



The seed value to use by the random number generator for this layer.

### ***No Overlap***

By default the system will scatter objects not checking for whether it is overlapping a previously scattered object, if you check this the system will use the Radius value below to make sure it does not overlap other scattered objects.

### ***Clear Overlap***

You can tell the system to clear the overlap table before scattering the layer by setting this.

### ***Radius***

The radius of the object that is being scattered, used by the overlap system. This will be adjusted by any scaling values for you.

### ***Col Radius Adj***

When the objects are being scattered they will check the ignore objects list to see if it is allowed to be scattered in that position, this value can be used to increase or decrease the radius of the check against these objects so you can make sure no object is scattered within that radius of the ignore object.

### ***Ray Count***

When the system is checking for ignore objects it will use a multiple raycast, all those rays need to be clear of any object this will stop objects hanging over edges etc, the more rays used the more accurate the test will be.

### ***Align***

Tells the system how much the object should be aligned to the surface it is scattered on, a value of 0 means no alignment will be done, a value of 1 means the object will totally align to the up value of the surface.

### ***Min Slope***

You can control whether the object is scattered onto sloping areas, so you can easily scatter plants onto say only flat areas by setting the max slope value to a low value.

### ***Max Slope***

The high limit for the slope the object can be scattered on.

### ***Collision Offset***

Vertical offset to add to the mesh, this can be used to make sure objects sit nicely on the surface depending on where their pivot point is.

### ***Use Height Limits***

Objects can also be limited to vertical zones of the surfaces, turn this on and two planes will be displayed that show the upper and lower limits of where this layer can be scattered.

### ***Min Height***

The lowest point past which the object will not be scattered.

### ***Max Height***

The highest point past which the object will not be scattered.

### ***Col Curve***

This curve is used to control the alpha value used in meshes, this alpha value could be used by shaders to control the amount a mesh is effected by wind etc. Using this curve you can control how stiff a plant is for its height etc.

### ***Color Variations***

This section shows the color variations section. See below.

### ***Vertex Limit***

You can set the maximum vertices in a mesh before a new object is created in a scene. Usually you would leave this at a high value to reduce the number of objects generated but if maybe you want more objects to increase culling or obstruction checks etc if so reduce this value.

### ***Vertex Noise***

If the scattered objects look too similar for you liking you can get the scatter system to add some vertex noise to each scattered mesh, so if you were scattering bricks you could make each one slightly different by turning this option on, same for plants etc.

### Noise Scale

How similar the noise is based on distance, higher values will give a more jaggy look to meshes.

### Strength

How much noise on each axis is added.

## Color Variations

If the color mesh option is on you can ask the system to change the vertex colors randomly with the colors you add here. This could be used to add different colored flowers to a scene from a single object source.

### Add Color

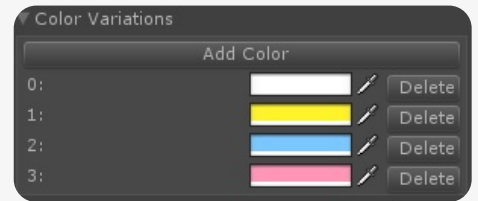
Add a new color to the variation list.

### Color

The color to be used.

### Delete

Delete the color from the list.



# MEGASCATTER MESH TEXTURE



This scatter object allows for multiple mesh objects to be scattered using colors on a source texture or textured object in the scene, multiple color masks can be defined per layer to give advanced control over where meshes appear and with the option for a second texture to control scaling of scattered objects you have even more control. The meshes will be combined into new meshes so reducing draw calls and improving performance. There are controls to control how many objects and which type the object will scatter, the areas to scatter to and the variations for each object scattered in to the scene.

## How to Use

To add a MegaScatter mesh object to your scene you just need to go to the GameObject menu and then 'Create Other/MegaScatter' and select 'Scatter Mesh Texture'. A Scatter mesh object will be added to your scene and named 'Scatter Mesh Texture'. In the inspector you will see an option to select a 'Texture' this is where you select any texture in your project as the scatter color texture where each color on the texture can be used to define a region for meshes to be scattered into. You can choose to select a textured object instead which in some cases can be easier as it is easier to visualize and control the positioning with a textured object. The object will require a collider and if using just the texture then that texture will need to be set to readable before it can be used. The Scatter Cols section in the layer inspector is where you define the color masks you want to use.

Once a texture or texture object has been selected you can set the mode in which the scatter count is calculated either it can be a pure count value or the scatter can be controlled via a Density value. The count mode is the easiest to use as you just set the total number of objects off all type you want the system to scatter and thats it. With the density mode the system will calculate how many objects to scatter based on the area of the spline shapes to be filled and the area of the objects to be scattered in that area. It is advised to start with the Count mode as depending on the import settings for meshes etc a high density value with tiny meshes can lead to 1000's of objects being scattered which could take a while, so it is best to setup the scatter with the Count mode and then if the Density mode is required switch to that and set the value at the end.

Now we can start to add the objects we want to scatter,

Below is a break down of all the controls available to you with the MegaScatter Mesh Texture component. Clicking the 'Add Mesh' button will add a new object to the list of objects to scatter. When added the inspector will show all the options to control how this mesh is to be added to the scene, first thing to do is to name the layer and select the object to scatter by clicking the 'Object' option in the inspector and selecting a mesh based object such as a rock. You will now need to setup the color masks to use for this layer. See the Scatter Cols section below for more on that. Clicking the green 'Update' button will now scatter that object to the scene and you should see it appear. Once you have the object appearing in the scene you can go ahead and start tweaking all the various options to control how and where the objects are scattered. Below you will find a complete description of each option and what effect it has on the scattering process.

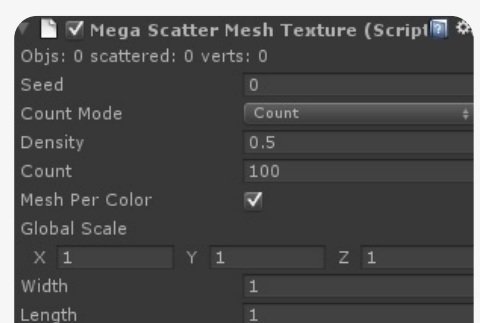
## Scatter Mesh Texture Params

These options control the general behaviour of the scatter and will effect all the meshes that are scattered.

### Info

The top label shows how many objects have been created by the scatter, how many objects were actually scattered and the number of vertices that were created.

### Seed





The random number seed to use for general scatter random values. Each mesh layer has its own seed value as well for more control.

### Count Mode

The mode used to control how many objects will be scattered in the scene. If Count mode is selected then the count value below will control how many objects will be scattered. If density mode is chosen the the density value along with the area of the splines and objects to be scattered will be used in the calculation. It is best to start with Count mode.

### Density

The Density of meshes to be scattered, the higher the value the more objects will scattered. The area of the splines along with the area of each mesh is taken into account when calculating the count, so changing the scale values of the meshes etc will change the number of objects scattered. Be careful if you have very small values and high density values as it could lead to a lot of objects being scattered.

### Count

The number of objects to scatter in Count mode. Note this is the maximum number that will be scattered in some cases the system may run out room to scatter the meshes into if you have no overlap on in which case you may not get the exact number of objects added.

### Mesh Per Color

If you have defined multiple color masks you can ask the system to create a new mesh for each shape instead of combining to one large area.

### Global Scale

A scale value that will be applied to the whole scatter object, makes it easy to adjust the size of everything instead of scaling each object layer.

### Width

If not using a textured object then this defines the width for area of scatter for object.

### Length

If not using a textured object then this defines the length for area of scatter for object.

### Texture

The texture map containing the colored regions to use to control the scatter.

### Scale

An optional texture to use to control the scaling of any objects scattered in the scene. The scaling is controlled by the red channel in this image.

### Min Scale

When using the scaling texture you can control the min and max scale value that are lerped between with the scaling color.

### Max Scale

When using the scaling texture you can control the min and max scale value that are lerped between with the scaling color.

### Min Size to Add

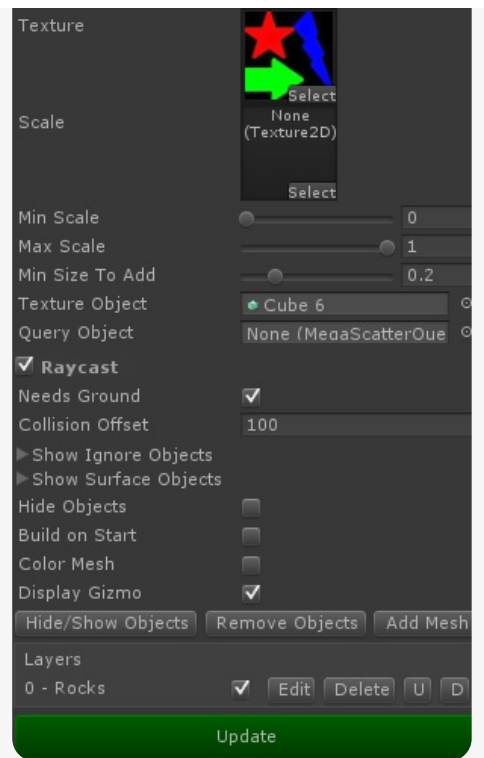
You can set a cut off scale value below which an object will not be scattered into the scene.

### Texture Object

Instead of using a texture and the width and length values to define the scatter area you can choose to use a textured object in the scene, the object must have a collider attached.

### Query Object

Unused at the moment but in future updates you can use a custom class to write your own scattering rules etc for custom scattering.



### **Raycast**

Tells the system that the scattered objects should be positioned on top of selected colliders. With this mode on you will need to add the objects you wish to scatter on by opening the Shows Surface Objects section below.

### **Needs Ground**

If raycast is on setting this means the scatter system must find a surface object for each scattered object, if not checked and no surface found the object will be added at the height of the shape.

### **Collision Offset**

Offset above the object to start the raycast from, this usually does not need to be changed.

### **Show Ignore Objects**

This will open the section where you can define which objects the system should not scatter on or near, see below.

### **Show Surface Objects**

This opens the section where you can define the objects that can be scattered on, see below.

### **Hide Objects**

When you update the scatter objects will be added to the scene, this could be a lot of objects and you may not want them showing up in the hierarchy etc, checking this will hide any created objects from the project hierarchy.

### **Build On Start**

Check this to have the system scatter the objects when the scene is started. You would normally test the scatter in the editor and then click the Remove Objects button before building the scene and having this option checked for the scatter to be recreated at start greatly reducing file sizes and load times.

### **Color Mesh**

You can ask the system to color the meshes in a way that means they can be moved by suitable shaders for effects like blowing in the wind. This mode also needs to be turned on if you want the system to change the vertex colors to use the color variation options below.

### **Display Gizmo**

Shows the various gizmos for the object such as the height limits.

### **Hide/Show Objects**

This will turn off and on all the objects that were scattered, this makes it easy to disable the generated scatter objects to make the scene less cluttered in edit mode or just to disable areas that can be turned on later such as rubble scatters for destroyed buildings.

### **Remove Objects**

This will remove all the scatter objects that were created.

### **Add Mesh**

Clicking this will add a new object to be scattered by this object.

### **Layers**

Shows the current layers the object will scatter, you can disable layers here as well as deleting or changing the scatter order.

### **Edit**

To edit the params for the layer click the Edit button this will then show the params for that layer in the inspector.

### **Delete**

Delete the mesh from the scatter layers.

### **U**

If you have no overlap set then the order the meshes are scattered will have an effect on the scene, usually it is best to have the layer with the lowest weight or more important to the scatter first going to less important. Clicking this will move the layer up one in the list.

### **D**

As above but will move the layer down the list.

## Show Splines

If you open this section you can select the splines that are to be included in the scatter.

## Update

Click the green update button to re scatter the objects in the scene.

## Ignore Objects

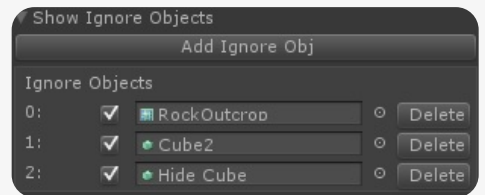
This section controls which objects are ignored from the scattering raycast tests.

### Object Select

You can pick any object in the scene with a collider attached to be used as a ignore object.

### Delete

Delete the object from the ignore list.



## Surface Objects

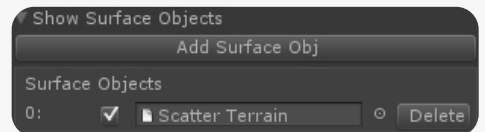
This section controls which objects are to be scattered on.

### Object Select

You can pick any object in the scene with a collider attached to be used as a surface object.

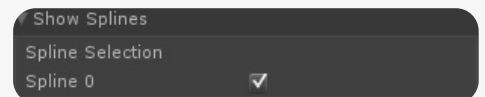
### Delete

Delete the object from the surface list.



## Splines

In this section you can control which splines are used by the scattering object. You just need to check and uncheck the box for each spline depending on whether you want it included or not.



## Mesh Layer Params

This is where you can control the scattering for each layer in the object, you have complete control over how each layer of the scatter behaves by changing the params in this section.

### Name

Name for the layer.

### Enabled

Whether or not this layer is to be included in the scatter.

### Mark Static

Mark any object generated for this layer to be marked as static in the scene.

### Add Color Mask

This is where you can add any number of color masks to be used by this layer. The system will check the scatter location on the texture and if the color found there is between the first and second color for any of these masks then the object will be scattered at that point.

### Color

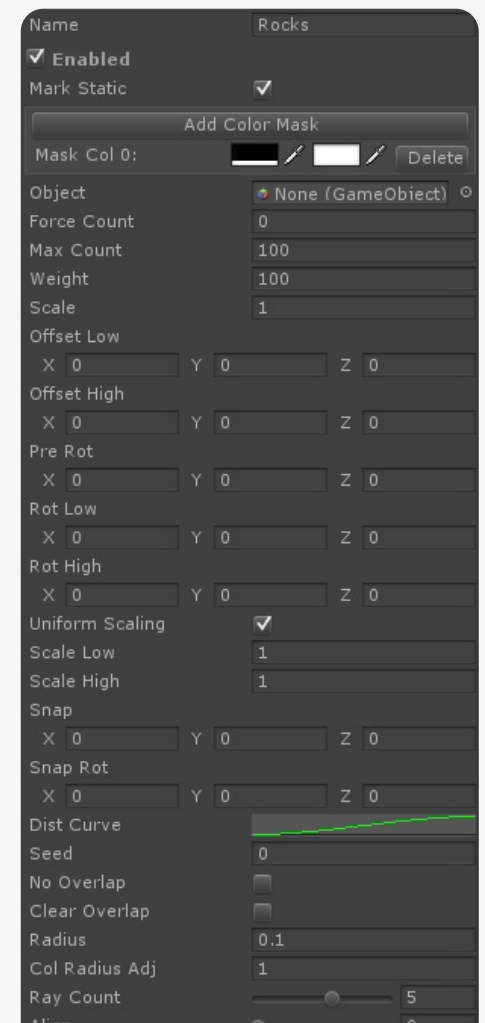
The low and high colors to use for this mask.

### Delete

You can delete a color mask by clicking this button.

### Object

The object mesh that will be scattered into the scene. This should currently be a single object, ie no children. Only the mesh data will be scattered any other



components attached to the object will be ignored, if you need that then you should use the Scatter Object version.

### **Counts Per Curve**

You can override the count value and say that the count for this layer should be per spline in the shape as opposed to the count being split across all the splines.

### **Force Count**

Again you can override any count with this value this will force the scatter system to scatter this many objects (unless it is higher than Max Count) regardless of the weight value or other settings. Set to 0 for no force count to be used.

### **Max Count**

This will limit the number of objects scattered. Set to 0 for no limit to be used.

### **Weight**

How much this layer will contribute to the total scatter count, the lower the value the less of the object will be scattered.

### **Scale**

Amount to scale the mesh by, this is useful for source meshes that have different sizes, you can easily get them to match by changing this value.

### **Offset Low**

A random offset can be added to each object before it is added, this is the low limit of the offset to use.

### **Offset High**

A random offset can be added to each object before it is added, this is the high limit of the offset to use.

### **Pre Rot**

It may be required that the mesh needs to be pre rotated before it is scattered to the scene, change this if your scattered objects are not in the correct orientation by default.

### **Rot Low**

A random rotation can be added to each object before it is added, this is the low limit of the rotation to use.

### **Rot High**

A random rotation can be added to each object before it is added, this is the high limit of the rotation to use.

### **Uniform Scaling**

For random scaling you can tell the system to randomly scale the object in a uniform if so check this, the scaling values below will be limited to a single value which will be used for all axis.

### **Scale Low**

A random scaling can be added to each object before it is added, this is the low limit of the scaling to use.

### **Scale High**

A random scaling can be added to each object before it is added, this is the high limit of the scaling to use.

### **Snap**

You can tell the system to snap any scattered object to these snap settings, use a 0 value for no snapping.

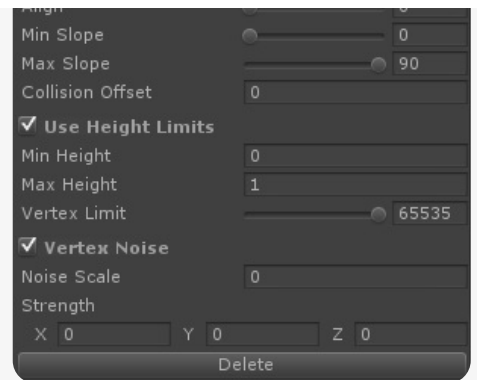
### **Snap Rot**

You can tell the system to snap any scattered objects rotation to these snap settings, use a 0 value for no snapping.

### **Dist Curve**

This curve will change how the random variations are defined. If it is a straight line from 0 to 1 then it will be an even random distribution, but if you want more variation towards the higher end you can adjust the curve to be steeper to one earlier etc.

### **Seed**



The seed value to use by the random number generator for this layer.

### **No Overlap**

By default the system will scatter objects not checking for whether it is overlapping a previously scattered object, if you check this the system will use the Radius value below to make sure it does not overlap other scattered objects.

### **Clear Overlap**

You can tell the system to clear the overlap table before scattering the layer by setting this.

### **Radius**

The radius of the object that is being scattered, used by the overlap system. This will be adjusted by any scaling values for you.

### **Col Radius Adj**

When the objects are being scattered they will check the ignore objects list to see if it is allowed to be scattered in that position, this value can be used to increase or decrease the radius of the check against these objects so you can make sure no object is scattered within that radius of the ignore object.

### **Ray Count**

When the system is checking for ignore objects it will use a multiple raycast, all those rays need to be clear of any object this will stop objects hanging over edges etc, the more rays used the more accurate the test will be.

### **Align**

Tells the system how much the object should be aligned to the surface it is scattered on, a value of 0 means no alignment will be done, a value of 1 means the object will totally align to the up value of the surface.

### **Min Slope**

You can control whether the object is scattered onto sloping areas, so you can easily scatter plants onto say only flat areas by setting the max slope value to a low value.

### **Max Slope**

The high limit for the slope the object can be scattered on.

### **Collision Offset**

Vertical offset to add to the mesh, this can be used to make sure objects sit nicely on the surface depending on where their pivot point is.

### **Use Height Limits**

Objects can also be limited to vertical zones of the surfaces, turn this on and two planes will be displayed that show the upper and lower limits of where this layer can be scattered.

### **Min Height**

The lowest point past which the object will not be scattered.

### **Max Height**

The highest point past which the object will not be scattered.

### **Col Curve**

This curve is used to control the alpha value used in meshes, this alpha value could be used by shaders to control the amount a mesh is effected by wind etc. Using this curve you can control how stiff a plant is for its height etc.

### **Color Variations**

This section shows the color variations section. See below.

### **Vertex Limit**

You can set the maximum vertices in a mesh before a new object is created in a scene. Usually you would leave this at a high value to reduce the number of objects generated but if maybe you want more objects to increase culling or obstruction checks etc if so reduce this value.

### **Vertex Noise**

If the scattered objects look too similar for you liking you can get the scatter system to add some vertex noise to each scattered mesh, so if you were scattering bricks you could make each one slightly different by turning this option on, same for plants etc.



### Noise Scale

How similar the noise is based on distance, higher values will give a more jaggy look to meshes.

### Strength

How much noise on each axis is added.

## Color Variations

If the color mesh option is on you can ask the system to change the vertex colors randomly with the colors you add here. This could be used to add different colored flowers to a scene from a single object source.

### Add Color

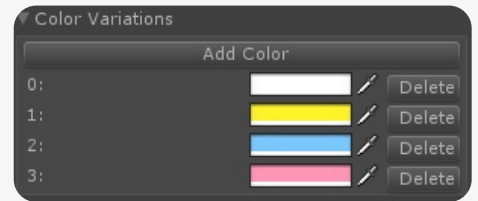
Add a new color to the variation list.

### Color

The color to be used.

### Delete

Delete the color from the list.



# MEGASCATTER OBJECT



This scatter object allows for multiple objects to be scattered inside closed splines. This system is different from the mesh based scatters that instead of the system building new meshes the actual objects will be scattered into the scene, this means anything at all can be used as a scatter object so could be complex characters, helper objects etc. There are controls to control how many objects and which type the object will scatter, the areas to scatter to and the variations for each object scattered in to the scene.

## How to Use

To add a MegaScatter Object to your scene you just need to go to the GameObject menu and then 'Create Other/MegaScatter' and select 'Scatter Object'. A Scatter Object object will be added to your scene and named 'Scatter Object'. In the inspector you will see an option to select a 'Shape' this is where you select the MegaShape object in the scene that defines the regions in which you wish to scatter the objects. This shape should hold one or more closed splines, you can define which curves the system will scatter in so if you have a Shape object with dozens of splines you will be able to select which splines to use by opening the 'Show Splines' section in the inspector and un checking or checking the box for each spline. You can also set the start and end curve values in the inspector.

Once a shape has been selected you can set the mode in which the scatter count is calculated either it can be a pure count value or the scatter can be controlled via a Density value. The count mode is the easiest to use as you just set the total number of objects of all type you want the system to scatter and that's it. With the density mode the system will calculate how many objects to scatter based on the area of the spline shapes to be filled and the area of the objects to be scattered in that area. It is advised to start with the Count mode as depending on the import settings for meshes etc a high density value with tiny meshes can lead to 1000's of objects being scattered which could take a while, so it is best to setup the scatter with the Count mode and then if the Density mode is required switch to that and set the value at the end.

Now we can start to add the objects we want to scatter,

Below is a break down of all the controls available to you with the MegaScatter Object component. Clicking the 'Add Mesh' button will add a new object to the list of objects to scatter. When added the inspector will show all the options to control how this mesh is to be added to the scene, first thing to do is to name the layer and select the object to scatter by clicking the 'Object' option in the inspector and selecting a mesh based object such as a rock. Clicking the green 'Update' button will now scatter that object to the scene and you should see it appear. Once you have the object appearing in the scene you can go ahead and start tweaking all the various options to control how and where the objects are scattered. Below you will find a complete description of each option and what effect it has on the scattering process.

## Scatter Object Params

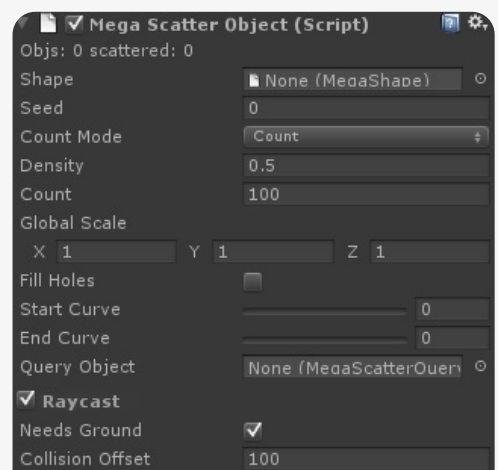
These options control the general behaviour of the scatter and will effect all the meshes that are scattered.

### Info

The top label shows how many objects have been created by the scatter, how many objects were actually scattered.

### Shape

The MegaShape spline object that holds the closed splines that will define the areas the objects will be scattered into. If a shape has some splines that are open they will not be taken into account. To scatter



using open splines the Scatter Along object types should be used.

### **Seed**

The random number seed to use for general scatter random values. Each mesh layer has its own seed value as well for more control.

### **Count Mode**

The mode used to control how many objects will be scattered in the scene. If Count mode is selected then the count value below will control how many objects will be scattered. If density mode is chosen the the density value along with the area of the splines and objects to be scattered will be used in the calculation. It is best to start with Count mode.

### **Density**

The Density of meshes to be scattered, the higher the value the more objects will scattered. The area of the splines along with the area of each mesh is taken into account when calculating the count, so changing the scale values of the meshes etc will change the number of objects scattered. Be careful if you have very small values and high density values as it could lead to a lot of objects being scattered.

### **Count**

The number of objects to scatter in Count mode. Note this is the maximum number that will be scattered in some cases the system may run out room to scatter the meshes into if you have no overlap on in which case you may not get the exact number of objects added.

### **Global Scale**

A scale value that will be applied to the whole scatter object, makes it easy to adjust the size of everything instead of scaling each object layer.

### **Fill Holes**

If you shape has closed splines inside other closed splines you tell the system to fill those as well, otherwise the system will use those as holes and not fill those areas.

### **Start Curve**

The first curve in the shape object to use for scattering in shapes with multiple splines.

### **End Curve**

The last curve to use for scattering in shapes with multiple splines.

### **Query Object**

Unused at the moment but in future updates you can use a custom class to write your own scattering rules etc for custom scattering.

### **Raycast**

Tells the system that the scattered objects should be positioned on top of selected colliders. With this mode on you will need to add the objects you wish to scatter on by opening the Shows Surface Objects section below.

### **Needs Ground**

If raycast is on setting this means the scatter system must find a surface object for each scattered object, if not checked and no surface found the object will be added at the height of the shape.

### **Collision Offset**

Offset above the object to start the raycast from, this usually does not need to be changed.

### **Show Ignore Objects**

This will open the section where you can define which objects the system should not scatter on or near, see below.

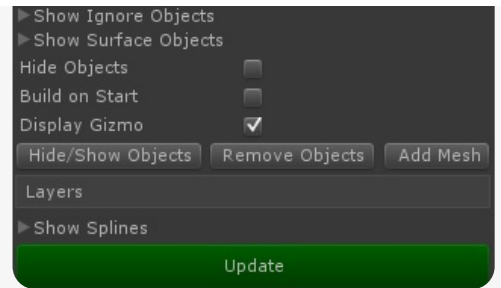
### **Show Surface Objects**

This opens the section where you can define the objects that can be scattered on, see below.

### **Hide Objects**

When you update the scatter objects will be added to the scene, this could be a lot of objects and you may not want them showing up in the hierarchy etc, checking this will hide any created objects from the project hierarchy.

### **Build On Start**



Check this to have the system scatter the objects when the scene is started. You would normally test the scatter in the editor and then click the Remove Objects button before building the scene and having this option checked for the scatter to be recreated at start greatly reducing file sizes and load times.

### Display Gizmo

Shows the various gizmos for the object such as the height limits.

### Hide/Show Objects

This will turn off and on all the objects that were scattered, this makes it easy to disable the generated scatter objects to make the scene less cluttered in edit mode or just to disable areas that can be turned on later such as rubble scatters for destroyed buildings.

### Remove Objects

This will remove all the scatter objects that were created.

### Add Mesh

Clicking this will add a new object to be scattered by this object.

### Layers

Shows the current layers the object will scatter, you can disable layers here as well as deleting or changing the scatter order.

### Edit

To edit the params for the layer click the Edit button this will then show the params for that layer in the inspector.

### Delete

Delete the mesh from the scatter layers.

### U

If you have no overlap set then the order the meshes are scattered will have an effect on the scene, usually it is best to have the layer with the lowest weight or more important to the scatter first going to less important. Clicking this will move the layer up one in the list.

### D

As above but will move the layer down the list.

### Show Splines

If you open this section you can select the splines that are to be included in the scatter.

### Update

Click the green update button to re scatter the objects in the scene.

## Ignore Objects

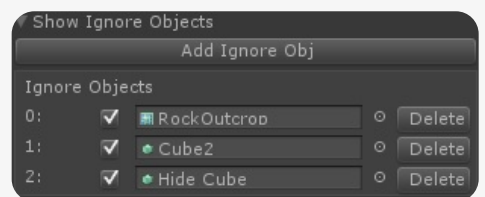
This section controls which objects are ignored from the scattering raycast tests.

### Object Select

You can pick any object in the scene with a collider attached to be used as a ignore object.

### Delete

Delete the object from the ignore list.



## Surface Objects

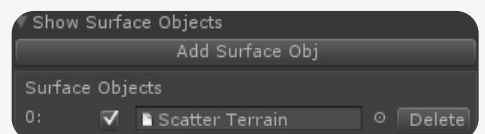
This section controls which objects are to be scattered on.

### Object Select

You can pick any object in the scene with a collider attached to be used as a surface object.

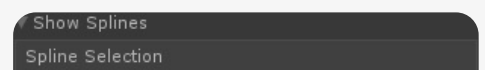
### Delete

Delete the object from the surface list.



## Splines

In this section you can control which splines are used



by the scattering object. You just need to check and uncheck the box for each spline depending on whether you want it included or not.

## Mesh Layer Params

This is where you can control the scattering for each layer in the object, you have complete control over how each layer of the scatter behaves by changing the params in this section.

### Name

Name for the layer.

### Enabled

Whether or not this layer is to be included in the scatter.

### Mark Static

Mark any object generated for this layer to be marked as static in the scene.

### Object

The object mesh that will be scattered into the scene. This should currently be a single object, ie no children. Only the mesh data will be scattered any other components attached to the object will be ignored, if you need that then you should use the Scatter Object version.

### Counts Per Curve

You can override the count value and say that the count for this layer should be per spline in the shape as opposed to the count being split across all the splines.

### Force Count

Again you can override any count with this value this will force the scatter system to scatter this many objects (unless it is higher than Max Count) regardless of the weight value or other settings. Set to 0 for no force count to be used.

### Max Count

This will limit the number of objects scattered. Set to 0 for no limit to be used.

### Weight

How much this layer will contribute to the total scatter count, the lower the value the less of the object will be scattered.

### Scale

Amount to scale the mesh by, this is useful for source meshes that have different sizes, you can easily get them to match by changing this value.

### Offset Low

A random offset can be added to each object before it is added, this is the low limit of the offset to use.

### Offset High

A random offset can be added to each object before it is added, this is the high limit of the offset to use.

### Pre Rot

It may be required that the mesh needs to be pre rotated before it is scattered to the scene, change this if your scattered objects are not in the correct orientation by default.

### Rot Low

A random rotation can be added to each object before it is added, this is the low limit of the rotation to use.

### Rot High

Spline 0 ✓

Name: Rocks

☒ Enabled

Mark Static: ☒

Object: RockMesh

Counts Per Curve: ☒

Force Count: 0

Max Count: 100

Weight: 100

Scale: 1

Offset Low

X: 0 Y: 0 Z: 0

Offset High

X: 0 Y: 0 Z: 0

Pre Rot

X: 0 Y: 0 Z: 0

Rot Low

X: 0 Y: 0 Z: 0

Rot High

X: 0 Y: 0 Z: 0

Uniform Scaling: ☒

Scale Low: 1

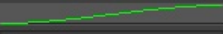
Scale High: 1

Snap

X: 0 Y: 0 Z: 0

Snap Rot

X: 0 Y: 0 Z: 0

Dist Curve: 

Seed: 0

No Overlap: ☐

Clear Overlap: ☐

Radius: 0.1

Col Radius Adj: 1

Ray Count: 5

Align: 0

Min Slope: 0

Max Slope: 90

Collision Offset: 0

☒ Use Height Limits

Min Height: 0

Max Height: 1

► Color Variations

Delete

A random rotation can be added to each object before it is added, this is the high limit of the rotation to use.

### ***Uniform Scaling***

For random scaling you can tell the system to randomly scale the object in a uniform if so check this, the scaling values below will be limited to a single value which will be used for all axis.

### ***Scale Low***

A random scaling can be added to each object before it is added, this is the low limit of the scaling to use.

### ***Scale High***

A random scaling can be added to each object before it is added, this is the high limit of the scaling to use.

### ***Snap***

You can tell the system to snap any scattered object to these snap settings, use a 0 value for no snapping.

### ***Snap Rot***

You can tell the system to snap any scattered objects rotation to these snap settings, use a 0 value for no snapping.

### ***Dist Curve***

This curve will change how the random variations are defined. If it is a straight line from 0 to 1 then it will be an even random distribution, but if you want more variation towards the higher end you can adjust the curve to be steeper to one earlier etc.

### ***Seed***

The seed value to use by the random number generator for this layer.

### ***No Overlap***

By default the system will scatter objects not checking for whether it is overlapping a previously scattered object, if you check this the system will use the Radius value below to make sure it does not overlap other scattered objects.

### ***Clear Overlap***

You can tell the system to clear the overlap table before scattering the layer by setting this.

### ***Radius***

The radius of the object that is being scattered, used by the overlap system. This will be adjusted by any scaling values for you.

### ***Col Radius Adj***

When the objects are being scattered they will check the ignore objects list to see if it is allowed to be scattered in that position, this value can be used to increase or decrease the radius of the check against these objects so you can make sure no object is scattered within that radius of the ignore object.

### ***Ray Count***

When the system is checking for ignore objects it will use a multiple raycast, all those rays need to be clear of any object this will stop objects hanging over edges etc, the more rays used the more accurate the test will be.

### ***Align***

Tells the system how much the object should be aligned to the surface it is scattered on, a value of 0 means no alignment will be done, a value of 1 means the object will totally align to the up value of the surface.

### ***Min Slope***

You can control whether the object is scattered onto sloping areas, so you can easily scatter plants onto say only flat areas by setting the max slope value to a low value.

### ***Max Slope***

The high limit for the slope the object can be scattered on.

### ***Collision Offset***

Vertical offset to add to the mesh, this can be used to make sure objects sit nicely on the surface depending on where their pivot point is.

### ***Use Height Limits***



Objects can also be limited to vertical zones of the surfaces, turn this on and two planes will be displayed that show the upper and lower limits of where this later can be scattered.

### ***Min Height***

The lowest point past which the object will not be scattered.

### ***Max Height***

The highest point past which the object will not be scattered.

### ***Color Variations***

This sections shows the color variations section. See below.

## **Color Variations**

If the color mesh option is on you can ask the system to change the vertex colors randomly with the colors you add here. This could be used to add different colored flowers to a scene from a single object source.

### ***Add Color***

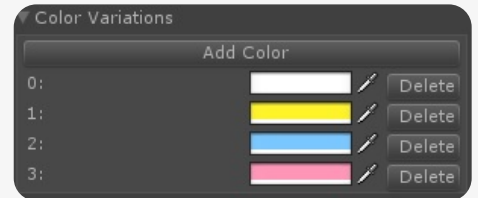
Add a new color to the variation list.

### ***Color***

The color to be used.

### ***Delete***

Delete the color from the list.



# MEGASCATTER OBJECT ALONG



This scatter object allows for multiple mesh objects to be scattered along and around any splines. This system is different from the mesh based scatters that instead of the system building new meshes the actual objects will be scattered into the scene, this means anything at all can be used as a scatter object so could be complex characters, helper objects etc. There are controls to control how many objects and which type the object will scatter, the areas to scatter to and the variations for each object scattered in to the scene.

## How to Use

To add a MegaScatter Object Along object to your scene you just need to go to the GameObject menu and then 'Create Other/MegaScatter' and select 'Scatter Object Along'. A Scatter Object object will be added to your scene and named 'Scatter Object Along'. In the inspector you will see an option to select a 'Shape' this is where you select the MegaShape object in the scene that defines the regions in which you wish to scatter the objects. This shape can contain 1 or more splines, you can define which curves the system will scatter in so if you have a Shape object with dozens of splines you will be able to select which splines to use by opening the 'Show Splines' section in the inspector and un checking or checking the box for each spline. You can also set the start and end curve values in the inspector.

Once a shape has been selected you can set the mode in which the scatter count is calculated either it can be a pure count value or the scatter can be controlled via a Density value. The count mode is the easiest to use as you just set the total number of objects off all type you want the system to scatter and that's it. With the density mode the system will calculate how many objects to scatter based on the area of the spline shapes to be filled and the area of the objects to be scattered in that area. It is advised to start with the Count mode as depending on the import settings for meshes etc a high density value with tiny meshes can lead to 1000's of objects being scattered which could take a while, so it is best to setup the scatter with the Count mode and then if the Density mode is required switch to that and set the value at the end.

Now we can start to add the objects we want to scatter,

Below is a break down of all the controls available to you with the MegaScatter Mesh component. Clicking the 'Add Mesh' button will add a new object to the list of objects to scatter. When added the inspector will show all the options to control how this mesh is to be added to the scene, first thing to do is to name the layer and select the object to scatter by clicking the 'Object' option in the inspector and selecting a mesh based object such as a rock. Clicking the green 'Update' button will now scatter that object to the scene and you should see it appear. Once you have the object appearing in the scene you can go ahead and start tweaking all the various options to control how and where the objects are scattered. Below you will find a complete description of each option and what effect it has on the scattering process.

## Scatter Object Along Params

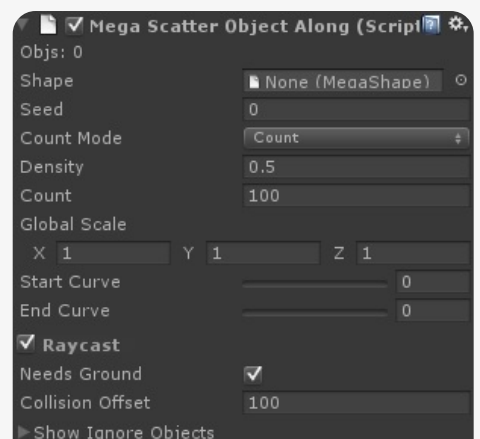
These options control the general behaviour of the scatter and will effect all the meshes that are scattered.

### Info

The top label shows how many objects have been created by the scatter, how many objects were actually scattered.

### Shape

The MegaShape spline object that holds the closed splines that will define the areas the objects will be scattered into. If a shape has some splines that are open they will not be taken into account. To scatter



using open splines the Scatter Along object types should be used.

### **Seed**

The random number seed to use for general scatter random values. Each mesh layer has its own seed value as well for more control.

### **Count Mode**

The mode used to control how many objects will be scattered in the scene. If Count mode is selected then the count value below will control how many objects will be scattered. If density mode is chosen the the density value along with the area of the splines and objects to be scattered will be used in the calculation. It is best to start with Count mode.

### **Density**

The Density of meshes to be scattered, the higher the value the more objects will scattered. The area of the splines along with the area of each mesh is taken into account when calculating the count, so changing the scale values of the meshes etc will change the number of objects scattered. Be careful if you have very small values and high density values as it could lead to a lot of objects being scattered.

### **Count**

The number of objects to scatter in Count mode. Note this is the maximum number that will be scattered in some cases the system may run out room to scatter the meshes into if you have no overlap on in which case you may not get the exact number of objects added.

### **Global Scale**

A scale value that will be applied to the whole scatter object, makes it easy to adjust the size of everything instead of scaling each object layer.

### **Start Curve**

The first curve in the shape object to use for scattering in shapes with multiple splines.

### **End Curve**

The last curve to use for scattering in shapes with multiple splines.

### **Query Object**

Unused at the moment but in future updates you can use a custom class to write your own scattering rules etc for custom scattering.

### **Raycast**

Tells the system that the scattered objects should be positioned on top of selected colliders. With this mode on you will need to add the objects you wish to scatter on by opening the Shows Surface Objects section below.

### **Needs Ground**

If raycast is on setting this means the scatter system must find a surface object for each scattered object, if not checked and no surface found the object will be added at the height of the shape.

### **Collision Offset**

Offset above the object to start the raycast from, this usually does not need to be changed.

### **Show Ignore Objects**

This will open the section where you can define which objects the system should not scatter on or near, see below.

### **Show Surface Objects**

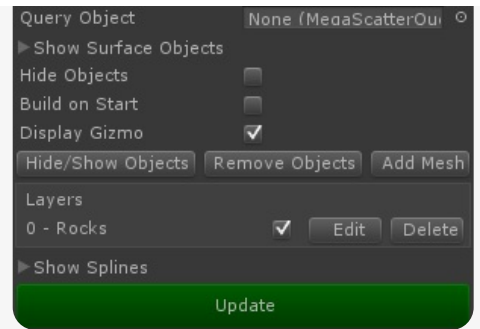
This opens the section where you can define the objects that can be scattered on, see below.

### **Hide Objects**

When you update the scatter objects will be added to the scene, this could be a lot of objects and you may not want them showing up in the hierarchy etc, checking this will hide any created objects from the project hierarchy.

### **Build On Start**

Check this to have the system scatter the objects when the scene is started. You would normally test the scatter in the editor and then click the Remove Objects button before building the scene and having this option checked for the scatter to be recreated at start greatly reducing file sizes and load times.



## Display Gizmo

Shows the various gizmos for the object such as the height limits.

## Hide/Show Objects

This will turn off and on all the objects that were scattered, this makes it easy to disable the generated scatter objects to make the scene less cluttered in edit mode or just to disable areas that can be turned on later such as rubble scatters for destroyed buildings.

## Remove Objects

This will remove all the scatter objects that were created.

## Add Mesh

Clicking this will add a new object to be scattered by this object.

## Layers

Shows the current layers the object will scatter, you can disable layers here as well as deleting or changing the scatter order.

## Edit

To edit the params for the layer click the Edit button this will then show the params for that layer in the inspector.

## Delete

Delete the mesh from the scatter layers.

## U

If you have no overlap set then the order the meshes are scattered will have an effect on the scene, usually it is best to have the layer with the lowest weight or more important to the scatter first going to less important. Clicking this will move the layer up one in the list.

## D

As above but will move the layer down the list.

## Show Splines

If you open this section you can select the splines that are to be included in the scatter.

## Update

Click the green update button to re scatter the objects in the scene.

## Ignore Objects

This section controls which objects are ignored from the scattering raycast tests.

## Object Select

You can pick any object in the scene with a collider attached to be used as a ignore object.

## Delete

Delete the object from the ignore list.

## Surface Objects

This section controls which objects are to be scattered on.

## Object Select

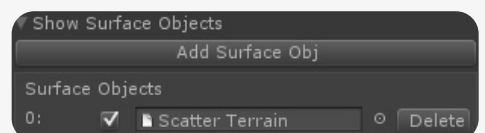
You can pick any object in the scene with a collider attached to be used as a surface object.

## Delete

Delete the object from the surface list.

## Splines

In this section you can control which splines are used by the scattering object. You just need to check and uncheck the box for each spline depending on whether you want it included or not.



## Mesh Layer Params

This is where you can control the scattering for each layer in the object, you have complete control over how each layer of the scatter behaves by changing the params in this section.

### Name

Name for the layer.

### Enabled

Whether or not this layer is to be included in the scatter.

### Mark Static

Mark any object generated for this layer to be marked as static in the scene.

### Object

The object mesh that will be scattered into the scene. This should currently be a single object, ie no children. Only the mesh data will be scattered any other components attached to the object will be ignored, if you need that then you should use the Scatter Object version.

### Counts Per Curve

You can override the count value and say that the count for this layer should be per spline in the shape as opposed to the count being split across all the splines.

### Force Count

Again you can override any count with this value this will force the scatter system to scatter this many objects (unless it is higher than Max Count) regardless of the weight value or other settings. Set to 0 for no force count to be used.

### Max Count

This will limit the number of objects scattered. Set to 0 for no limit to be used.

### Weight

How much this layer will contribute to the total scatter count, the lower the value the less of the object will be scattered.

### Scale

Amount to scale the mesh by, this is useful for source meshes that have different sizes, you can easily get them to match by changing this value.

### Min Distance

How far away from the spline the scattering should start, 0 would be right on the spline. This allows you to scatter objects as a border around splines as well as along them.

### Max Distance

How far away from the spline the scattering should end, 0 would be right on the spline. This allows you to scatter objects as a border around splines as well as along them.

### Scale on Dist

With this curve you can control the scale of the object that is being scattered based on its distance between the min and max distance values.

### Offset Low

A random offset can be added to each object before it is added, this is the low limit of the offset to use.

### Offset High

A random offset can be added to each object before it is added, this is the high limit of the offset to use.

Name: Rocks

☒ Enabled

Mark Static: ☒

Object: \*None (GameObject) ⓘ

Counts Per Curve: ☒

Force Count: 0

Max Count: 100

Weight: 100

Scale: 1

Min Distance: 0

Max Distance: 0.1

Scale on Dist: [Graph]

Offset Low: X 0 Y 0 Z 0

Offset High: X 0 Y 0 Z 0

Pre Rot: X 0 Y 0 Z 0

Rot Low: X 0 Y 0 Z 0

Rot High: X 0 Y 0 Z 0

Uniform Scaling: ☒

Scale Low: 1

Scale High: 1

Snap: X 0 Y 0 Z 0

Snap Rot: X 0 Y 0 Z 0

Dist Curve: [Graph]

Seed: 0

No Overlap: ☐

Clear Overlap: ☐

Radius: 0.1

Col Radius Adj: 1

Ray Count: 5

Align: 0

Min Slope: 0

Max Slope: 90

Collision Offset: 0

☒ Use Height Limits

Min Height: 0

Max Height: 1

Color Variations: [Graph]

Delete

### ***Pre Rot***

It may be required that the mesh needs to be pre rotated before it is scattered to the scene, change this if your scattered objects are not in the correct orientation by default.

### ***Rot Low***

A random rotation can be added to each object before it is added, this is the low limit of the rotation to use.

### ***Rot High***

A random rotation can be added to each object before it is added, this is the high limit of the rotation to use.

### ***Uniform Scaling***

For random scaling you can tell the system to randomly scale the object in a uniform if so check this, the scaling values below will be limited to a single value which will be used for all axis.

### ***Scale Low***

A random scaling can be added to each object before it is added, this is the low limit of the scaling to use.

### ***Scale High***

A random scaling can be added to each object before it is added, this is the high limit of the scaling to use.

### ***Snap***

You can tell the system to snap any scattered object to these snap settings, use a 0 value for no snapping.

### ***Snap Rot***

You can tell the system to snap any scattered objects rotation to these snap settings, use a 0 value for no snapping.

### ***Dist Curve***

This curve will change how the random variations are defined. If it is a straight line from 0 to 1 then it will be an even random distribution, but if you want more variation towards the higher end you can adjust the curve to be steeper to one earlier etc.

### ***Seed***

The seed value to use by the random number generator for this layer.

### ***No Overlap***

By default the system will scatter objects not checking for whether it is overlapping a previously scattered object, if you check this the system will use the Radius value below to make sure it does not overlap other scattered objects.

### ***Clear Overlap***

You can tell the system to clear the overlap table before scattering the layer by setting this.

### ***Radius***

The radius of the object that is being scattered, used by the overlap system. This will be adjusted by any scaling values for you.

### ***Col Radius Adj***

When the objects are being scattered they will check the ignore objects list to see if it is allowed to be scattered in that position, this value can be used to increase or decrease the radius of the check against these objects so you can make sure no object is scattered within that radius of the ignore object.

### ***Ray Count***

When the system is checking for ignore objects it will use a multiple raycast, all those rays need to be clear of any object this will stop objects hanging over edges etc, the more rays used the more accurate the test will be.

### ***Align***

Tells the system how much the object should be aligned to the surface it is scattered on, a value of 0 means no alignment will be done, a value of 1 means the object will totally align to the up value of the surface.

### ***Min Slope***

You can control whether the object is scattered onto sloping areas, so you can easily scatter plants onto say only flat areas by setting the max slope value to a low value.



### **Max Slope**

The high limit for the slope the object can be scattered on.

### **Collision Offset**

Vertical offset to add to the mesh, this can be used to make sure objects sit nicely on the surface depending on where their pivot point is.

### **Use Height Limits**

Objects can also be limited to vertical zones of the surfaces, turn this on and two planes will be displayed that show the upper and lower limits of where this later can be scattered.

### **Min Height**

The lowest point past which the object will not be scattered.

### **Max Height**

The highest point past which the object will not be scattered.

### **Col Curve**

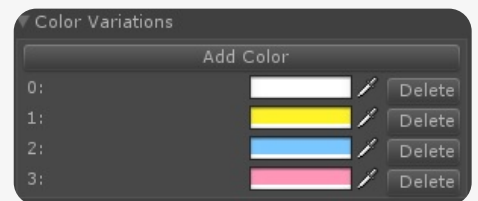
This curve is used to control the alpha value used in meshes, this alpha value could be used by shaders to control the amount a mesh is effected by wind etc. Using this curve you can control how stiff a plant is for its height etc.

### **Color Variations**

This sections shows the color variations section. See below.

### **Color Variations**

If the color mesh option is on you can ask the system to change the vertex colors randomly with the colors you add here. This could be used to add different colored flowers to a scene from a single object source.



#### **Add Color**

Add a new color to the variation list.

#### **Color**

The color to be used.

#### **Delete**

Delete the color from the list.

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# MEGASCATTER OBJECT TEXTURE



This scatter object allows for multiple mesh objects to be scattered using colors on a source texture or textured object in the scene, multiple color masks can be defined per layer to give advanced control over where meshes appear and with the option for a second texture to control scaling of scattered objects you have even more control. This system is different from the mesh based scatters that instead of the system building new meshes the actual objects will be scattered into the scene, this means anything at all can be used as a scatter object so could be complex characters, helper objects etc. There are controls to control how many objects and which type the object will scatter, the areas to scatter to and the variations for each object scattered in to the scene.

## How to Use

To add a MegaScatter mesh object to your scene you just need to go to the GameObject menu and then 'Create Other/MegaScatter' and select 'Scatter Object Texture'. A Scatter Object Texture object will be added to your scene and named 'Scatter Object Texture'. In the inspector you will see an option to select a 'Texture' this is where you select any texture in your project as the scatter color texture where each color on the texture can be used to define a region for meshes to be scattered into. You can choose to select a textured object instead which in some cases can be easier as it is easier to visualize and control the positioning with a textured object. The object will require a collider and if using just the texture then that texture will need to be set to readable before it can be used. The Scatter Cols section in the layer inspector is where you define the color masks you want to use.

Once a texture or texture object has been selected you can set the mode in which the scatter count is calculated either it can be a pure count value or the scatter can be controlled via a Density value. The count mode is the easiest to use as you just set the total number of objects off all type you want the system to scatter and thats it. With the density mode the system will calculate how many objects to scatter based on the area of the spline shapes to be filled and the area of the objects to be scattered in that area. It is advised to start with the Count mode as depending on the import settings for meshes etc a high density value with tiny meshes can lead to 1000's of objects being scattered which could take a while, so it is best to setup the scatter with the Count mode and then if the Density mode is required switch to that and set the value at the end.

Now we can start to add the objects we want to scatter,

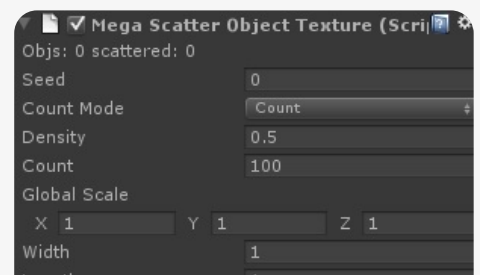
Below is a break down of all the controls available to you with the MegaScatter Object Texture component. Clicking the 'Add Mesh' button will add a new object to the list of objects to scatter. When added the inspector will show all the options to control how this mesh is to be added to the scene, first thing to do is to name the layer and select the object to scatter by clicking the 'Object' option in the inspector and selecting a mesh based object such as a rock. You will now need to setup the color masks to use for this layer. See the Scatter Cols section below for more on that. Clicking the green 'Update' button will now scatter that object to the scene and you should see it appear. Once you have the object appearing in the scene you can go ahead and start tweaking all the various options to control how and where the objects are scattered. Below you will find a complete description of each option and what effect it has on the scattering process.

## Scatter Object Texture Params

These options control the general behaviour of the scatter and will effect all the meshes that are scattered.

### Info

The top label shows how many objects have been created by the scatter, how many objects were actually scattered.



### Seed

The random number seed to use for general scatter random values. Each mesh layer has its own seed value as well for more control.

### Count Mode

The mode used to control how many objects will be scattered in the scene. If Count mode is selected then the count value below will control how many objects will be scattered. If density mode is chosen the density value along with the area of the splines and objects to be scattered will be used in the calculation. It is best to start with Count mode.

### Density

The Density of meshes to be scattered, the higher the value the more objects will be scattered. The area of the splines along with the area of each mesh is taken into account when calculating the count, so changing the scale values of the meshes etc will change the number of objects scattered. Be careful if you have very small values and high density values as it could lead to a lot of objects being scattered.

### Count

The number of objects to scatter in Count mode. Note this is the maximum number that will be scattered in some cases the system may run out of room to scatter the meshes into if you have no overlap on in which case you may not get the exact number of objects added.

### Global Scale

A scale value that will be applied to the whole scatter object, makes it easy to adjust the size of everything instead of scaling each object layer.

### Width

If not using a textured object then this defines the width for area of scatter for object.

### Length

If not using a textured object then this defines the length for area of scatter for object.

### Texture

The texture map containing the colored regions to use to control the scatter.

### Scale

An optional texture to use to control the scaling of any objects scattered in the scene. The scaling is controlled by the red channel in this image.

### Min Scale

When using the scaling texture you can control the min and max scale value that are lerped between with the scaling color.

### Max Scale

When using the scaling texture you can control the min and max scale value that are lerped between with the scaling color.

### Min Size to Add

You can set a cut off scale value below which an object will not be scattered into the scene.

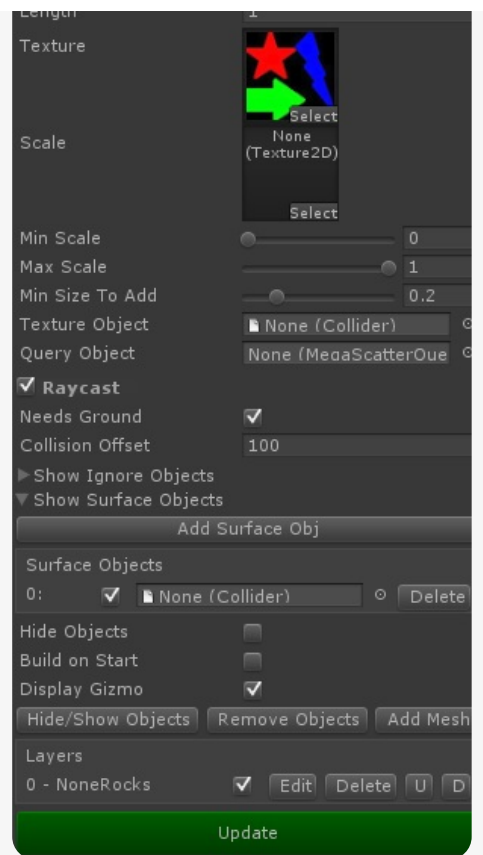
### Texture Object

Instead of using a texture and the width and length values to define the scatter area you can choose to use a textured object in the scene, the object must have a collider attached.

### Query Object

Unused at the moment but in future updates you can use a custom class to write your own scattering rules etc for custom scattering.

### Raycast



Tells the system that the scattered objects should be positioned on top of selected colliders. With this mode on you will need to add the objects you wish to scatter on by opening the Shows Surface Objects section below.

### ***Needs Ground***

If raycast is on setting this means the scatter system must find a surface object for each scattered object, if not checked and no surface found the object will be added at the height of the shape.

### ***Collision Offset***

Offset above the object to start the raycast from, this usually does not need to be changed.

### ***Show Ignore Objects***

This will open the section where you can define which objects the system should not scatter on or near, see below.

### ***Show Surface Objects***

This opens the section where you can define the objects that can be scattered on, see below.

### ***Hide Objects***

When you update the scatter objects will be added to the scene, this could be a lot of objects and you may not want them showing up in the hierarchy etc, checking this will hide any created objects from the project hierarchy.

### ***Build On Start***

Check this to have the system scatter the objects when the scene is started. You would normally test the scatter in the editor and then click the Remove Objects button before building the scene and having this option checked for the scatter to be recreated at start greatly reducing file sizes and load times.

### ***Display Gizmo***

Shows the various gizmos for the object such as the height limits.

### ***Hide/Show Objects***

This will turn off and on all the objects that were scattered, this makes it easy to disable the generated scatter objects to make the scene less cluttered in edit mode or just to disable areas that can be turned on later such as rubble scatters for destroyed buildings.

### ***Remove Objects***

This will remove all the scatter objects that were created.

### ***Add Mesh***

Clicking this will add a new object to be scattered by this object.

### ***Layers***

Shows the current layers the object will scatter, you can disable layers here as well as deleting or changing the scatter order.

### ***Edit***

To edit the params for the layer click the Edit button this will then show the params for that layer in the inspector.

### ***Delete***

Delete the mesh from the scatter layers.

### ***U***

If you have no overlap set then the order the meshes are scattered will have an effect on the scene, usually it is best to have the layer with the lowest weight or more important to the scatter first going to less important. Clicking this will move the layer up one in the list.

### ***D***

As above but will move the layer down the list.

### ***Show Splines***

If you open this section you can select the splines that are to be included in the scatter.

### ***Update***

Click the green update button to re scatter the objects in the scene.

## Ignore Objects

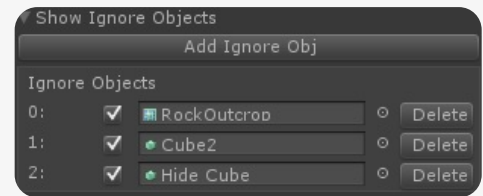
This section controls which objects are ignored from the scattering raycast tests.

### Object Select

You can pick any object in the scene with a collider attached to be used as a ignore object.

### Delete

Delete the object from the ignore list.



## Surface Objects

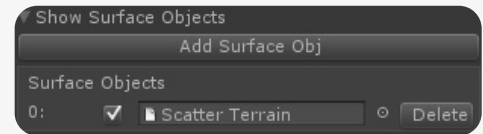
This section controls which objects are to be scattered on.

### Object Select

You can pick any object in the scene with a collider attached to be used as a surface object.

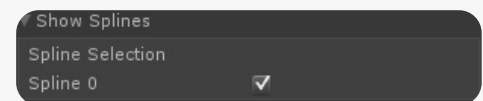
### Delete

Delete the object from the surface list.



## Splines

In this section you can control which splines are used by the scattering object. You just need to check and uncheck the box for each spline depending on whether you want it included or not.



## Mesh Layer Params

This is where you can control the scattering for each layer in the object, you have complete control over how each layer of the scatter behaves by changing the params in this section.

### Name

Name for the layer.

### Enabled

Whether or not this layer is to be included in the scatter.

### Mark Static

Mark any object generated for this layer to be marked as static in the scene.

### Add Color Mask

This is where you can add any number of color masks to be used by this layer. The system will check the scatter location on the texture and if the color found there is between the first and second color for any of these masks then the object will be scattered at that point.

### Color

The low and high colors to use for this mask.

### Delete

You can delete a color mask by clicking this button.

### Object

The object mesh that will be scattered into the scene. This should currently be a single object, ie no children. Only the mesh data will be scattered any other components attached to the object will be ignored, if you need that then you should use the Scatter Object version.

### Force Count

Again you can override any count with this value this will force the scatter system to scatter this many



objects (unless it is higher than Max Count) regardless of the weight value or other settings. Set to 0 for no force count to be used.

### **Max Count**

This will limit the number of objects scattered. Set to 0 for no limit to be used.

### **Weight**

How much this layer will contribute to the total scatter count, the lower the value the less of the object will be scattered.

### **Scale**

Amount to scale the mesh by, this is useful for source meshes that have different sizes, you can easily get them to match by changing this value.

### **Offset Low**

A random offset can be added to each object before it is added, this is the low limit of the offset to use.

### **Offset High**

A random offset can be added to each object before it is added, this is the high limit of the offset to use.

### **Pre Rot**

It may be required that the mesh needs to be pre rotated before it is scattered to the scene, change this if your scattered objects are not in the correct orientation by default.

### **Rot Low**

A random rotation can be added to each object before it is added, this is the low limit of the rotation to use.

### **Rot High**

A random rotation can be added to each object before it is added, this is the high limit of the rotation to use.

### **Uniform Scaling**

For random scaling you can tell the system to randomly scale the object in a uniform if so check this, the scaling values below will be limited to a single value which will be used for all axis.

### **Scale Low**

A random scaling can be added to each object before it is added, this is the low limit of the scaling to use.

### **Scale High**

A random scaling can be added to each object before it is added, this is the high limit of the scaling to use.

### **Snap**

You can tell the system to snap any scattered object to these snap settings, use a 0 value for no snapping.

### **Snap Rot**

You can tell the system to snap any scattered objects rotation to these snap settings, use a 0 value for no snapping.

### **Dist Curve**

This curve will change how the random variations are defined. If it is a straight line from 0 to 1 then it will be an even random distribution, but if you want more variation towards the higher end you can adjust the curve to be steeper to one earlier etc.

### **Seed**

The seed value to use by the random number generator for this layer.

### **No Overlap**

By default the system will scatter objects not checking for whether it is overlapping a previously scattered object, if you check this the system will use the Radius value below to make sure it does not overlap other scattered objects.

### **Clear Overlap**

You can tell the system to clear the overlap table before scattering the layer by setting this.

### **Radius**

The radius of the object that is being scattered, used by the overlap system. This will be adjusted by any

scaling values for you.

### **Col Radius Adj**

When the objects are being scattered they will check the ignore objects list to see if it is allowed to be scattered in that position, this value can be used to increase or decrease the radius of the check against these objects so you can make sure no object is scattered within that radius of the ignore object.

### **Ray Count**

When the system is checking for ignore objects it will use a multiple raycast, all those rays need to be clear of any object this will stop objects hanging over edges etc, the more rays used the more accurate the test will be.

### **Align**

Tells the system how much the object should be aligned to the surface it is scattered on, a value of 0 means no alignment will be done, a value of 1 means the object will totally aligned to the up value of the surface.

### **Min Slope**

You can control whether the object is scattered onto sloping areas, so you can easily scatter plants onto say only flat areas by setting the max slope value to a low value.

### **Max Slope**

The high limit for the slope the object can be scattered on.

### **Collision Offset**

Vertical offset to add to the mesh, this can be used to make sure objects sit nicely on the surface depending on where their pivot point is.

### **Use Height Limits**

Objects can also be limited to vertical zones of the surfaces, turn this on and two planes will be displayed that show the upper and lower limits of where this later can be scattered.

### **Min Height**

The lowest point past which the object will not be scattered.

### **Max Height**

The highest point past which the object will not be scattered.

### **Col Curve**

This curve is used to control the alpha value used in meshes, this alpha value could be used by shaders to control the amount a mesh is effected by wind etc. Using this curve you can control how stiff a plant is for its height etc.

### **Color Variations**

This sections shows the color variations section. See below.

### **Vertex Limit**

You can set the maximum vertices in a mesh before a new object is created in a scene. Usually you would leave this at a high value to reduce the number of objects generated but it maybe you want more objects to increase culling or obstruction checks etc if so reduce this value.

### **Vertex Noise**

If the scattered objects look too similar for you liking you can get the scatter system to add some vertex noise to each scattered mesh, so if you were scattering bricks you could make each one slightly different by turning this option on, same for plants etc.

### **Noise Scale**

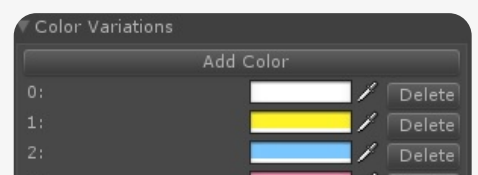
How similar the noise is based on distance, higher values will give a more jaggy look to meshes.

### **Strength**

How much noise on each axis is added.

## **Color Variations**

If the color mesh option is on you can ask the system to change the vertex colors randomly with the colors you add here. This could be used to add different colored flowers to a scene from a single object source.





### **Add Color**

Add a new color to the variation list.

### **Color**

The color to be used.

### **Delete**

Delete the color from the list.

---

# MEGASCATTER SCRIPTING

This page will show the public values and methods available to scripters to control the MegaScatter system.

## MegaScatter Enums

This holds the two types that control how many scattered objects appear in the scene.

```
public enum MegaScatterMode
{
    Density,
    Count,
}
```

### *Density*

Scatter count is calculated from Area of meshes and splines.

### *Count*

Scatter count is set via the Count values in MegaScatter and MegaScatterMeshInf classes.

## MegaScatterCol Class

This simple class is used for Texture scatter objects to define color masks.

```
public class MegaScatterCol
{
    public Color lowcol;
    public Color highcol;
}
```

## Members

### *lowcol*

Defines the start of a color range used by Texture scatter classes, texture color will need to fall between this and highcol for an object to be placed.

### *highcol*

Defines the end of a color range used by Texture scatter classes, texture color will need to fall between this and lowcol for an object to be placed.

## MegaScatterLayer Class

This is the main Scatter Layer

```
public class MegaScatterLayer
{
    public string          LayerName;
    public bool            Enabled;
    public GameObject      obj;
    public float            weight;
    public float            scale;
    public bool            uniformScaling;
    public float            uniscaleLow;
    public float            uniscaleHigh;
    public Vector3          prerot;
    public Vector3          scaleLow;
    public Vector3          scaleHigh;
    public Vector3          rotLow;
    public Vector3          rotHigh;
    public Vector3          offsetLow;
    public Vector3          offsetHigh;
    public Vector3          snap;
    public Vector3          snapRot;
    public AnimationCurve   distCrv;
    public int              seed;
    public bool             noOverlap;
    public float            radius;
    public float            colradiusadj;
    public int              raycount;
    public float            align;
    public bool             clearOverlap;
    public bool             markstatic;
    public float            minDistance;
```

```

    public float          maxDistance;
    public float          colAmt;
    public AnimationCurve colcurve;
    public int            forcecount;
    public int            maxcount;
    public bool           perCurveCount;
    public List<MegaScatterCol> scattercols;
    public AnimationCurve scaleOnDist;
    public int            vertexlimit;
    public bool           vertexnoise;
    public float          noisescale;
    public Vector3        strength;
    public List<Color>    colvariations;
    public float          minslope;
    public float          maxslope;
    public float          collisionOffset;
    public bool           useheight;
    public float          minheight;
    public float          maxheight;
}

```

## Members

### *LayerName*

Name for the layer.

### *Enabled*

Whether the layer is active in the scatter or not.

### *obj*

The source object to use for this layer.

### *weight*

How much this layer will contribute to the overall scatter count. The higher the number relative to other layers the more of this layer object will be in the scatter.

### *scale*

A quick scale value for this layer, makes it easier if you have source objects of different sizes.

### *uniformScaling*

Should the random scaling be uniform across all axis or use per axis values. If true then uniscalelow and uniscalehigh will be used as the scaling range, if false scaleLow and scaleHigh will be used.

### *uniscaleLow*

The low value for the uniform scaling variation.

### *uniscaleHigh*

The high value for the uniform scaling variation.

### *prerot*

Some objects have differnt up values etc, so here you can correct that so objects appear correctly when scattered.

### *scaleLow*

The low scale Vector3 value to use for scaling variation.

### *scaleHigh*

The high scale Vector3 value to use for scaling variation.

### *rotLow*

The low rotation Vector3 value to use for rotation variation.

### *rotHigh*

The high scale Vector3 value to use for rotation variation.

### *offsetLow*

The low offset Vector3 value to use for positioning variation.

### *offsetHigh*

The high offset Vector3 value to use for positioning variation.

### ***snap***

The position snap values, use this to make objects snap to grid positions.

### ***snapRot***

The rotation snap values, use this to make scatter objects only use certain angles.

### ***distCrv***

This curve describes the distribution of the random number.

### ***seed***

The random number seed for the layer.

### ***noOverlap***

Set to true if you want the system to check for overlapping objects.

### ***radius***

The radius for the layer used in the overlap test.

### ***colradiusadj***

When scattering against walls etc you can increase the radius check size to force things away from ignore objects, Has no effect on overlap just on ignore objects.

### ***raycount***

Number of rays to use in the raycasts, the more used the more accurate the tests.

### ***align***

Value from 0 to 1 to say how much the layer should align with any ground object.

### ***clearOverlap***

Clears the overlap data so layer can overlap already scattered objects but not itself.

### ***markstatic***

Marks any created objects as static in the scene.

### ***minDistance***

For scatter along objects this is the min distance from the spline an object can appear, 0 means on the spline.

### ***maxDistance***

For scatter along objects this is the max distance from the spline an object can appear.

### ***colAmt***

How much the vertical coloring alpha is applied to the layer.

### ***colcurve***

Curve that controls the vertical coloring of the mesh alpha, can be used to make things stiffer at the bottom etc.

### ***forcecount***

This value will override any counts calculated for this layer. 0 means use calculated count.

### ***maxcount***

The maximum number of objects to be scattered for this layer, again will override any other count values.

### ***perCurveCount***

If the scatter shape is made up of multiple splines setting this will mean the counts are calculated for each spline as opposed to the whole shape.

### ***scattercols***

For scattering to textures this holds the list of the various color masks for the scattering.

### ***scaleOnDist***

For scatter along objects you can control the scaling of the scatter mesh based on distance from the spline using this curve.

### ***vertexlimit***

The max vertex count before a new mesh is created.

### *vertexnoise*

Set to true to apply vertex noise to mesh scatters.

### *noisescale*

The roughness of the noise.

### *strength*

How much noise to apply to each axis.

### *colvariations*

If the scatter objects are being colored this list holds the color variations to use.

### *minslope*

The min slope angle this layer can be scattered on.

### *maxslope*

The max slope angle this layer can be scattered on.

### *collisionOffset*

Allows for control of how far above or below the ground meshes will appear, useful for fine tuning meshes to sit nicely on the ground if their pivots are not at the base.

### *useheight*

Set to true to use the height values below to control scattering.

### *minheight*

The height below which this layer will not be scattered.

### *maxheight*

The height above which this layer will not be scattered.

## MegaScatterCollisionObj

This class is used to describe objects that scatters can and can not appear on.

```
public class MegaScatterCollisionObj
{
    public Collider collider;
    public bool active;
}
```

## Members

### *collider*

The collider object to use in the scene.

### *active*

Whether is collider is used in the scatter tests.

## MegaScatter

This is the base class for the various Scatter Object types in the system.

```
public class MegaScatter : MonoBehaviour
{
    public bool buildOnStart;
    public bool update;
    public bool meshPerShape;
    public float Density;
    public int forcecount;
    public MegaScatterMode countmode;
    public int StartCurve;
    public int EndCurve;
    public bool raycast;
    public bool NeedsGround;
    public float collisionOffset;
    public MegaShape shape;
    public List<bool> usespline;
    public List<MegaScatterLayer> layers;
    public int seed = 0;
```

```

public bool                hideObjects;
public Vector3              globalScale;
public bool                fillHoles;
public bool                colorMesh;
public List<MegaScatterCollisionObj> ignoreobjs;
public List<MegaScatterCollisionObj> surfaces;
public MegaScatterQuery    queryObject;
public Collider             texturecollider;
}

```

## Members

### *buildOnStart*

Set to true to have scatter objects at start.

### *update*

set to true to allow the system to rescatter.

### *meshPerShape*

Tells the system to make a new mesh for each spline in the scatter shape or color mask for texture scatters.

### *Density*

The density value, the higher the more objects will be scattered.

### *forcecount*

The number of meshes to scatter when in Count mode.

### *countmode*

The mode to use to calculate how many meshes are to be scattered, Count or Density.

### *StartCurve*

If the shape to scatter to has multiple splines you can limit the splines to use by changing this.

### *EndCurve*

If the shape to scatter to has multiple splines you can limit the splines to use by changing this.

### *raycast*

Whether this scatter objects does raycast to position objects on the ground.

### *NeedsGround*

If raycasting but no ground set then with this set to true no object will appear unless there is ground for it.

### *CollisionOffset*

How far above the shape raycasts start.

### *shape*

The shape to scatter into or along.

### *usespline*

This is a list of bools one per spline in the shape so you can turn off or on a spline to control the scatter.

### *layers*

The layers to scatter for this object (see above)

### *seed*

The random number see for this object.

### *hideObjects*

Will hide any objects generated i the hierarchy.

### *globalScale*

A scaling value to apply to all layers, makes it easy to adjust the whole scatter object if it is not the right size.

### *fillHoles*

With multiple spline shapes will tell the system to detect holes and to scatter or not into them.

### *colorMesh*

Tells the system to color the meshes.

### *ignoreobjs*

List of colliders the scatter should not scatter on or near.

### *surfaces*

List of colliders that the scatter should scatter on.

### *queryObject*

Not currently used.

### *texturecollider*

Texture scatters can use either a texture or a textured object.

## MegaScatter Methods

```
public void SetShape(MegaShape newshape)
```

**newshape** – The new MegaShape object to use.

The shape used for the scattering can be changed by calling this method with the new MegaShape object to use.

```
public int NumLayers()
```

Returns an int with the number of mesh layers the scatter object uses.

```
public string GetLayerName(int i)
```

**i** – Index for the layer to return the name for.

Returns a string for the layer whose index is passed in.

```
public bool IsLayerOn(string name)
```

**name** – The layer name to check.

Returns true if the layer with the name passed is active in the scatter, false if it is not.

```
public bool IsLayerOn(int i)
```

**i** – Index to return the Enabled state for.

Returns true is the layer is On false if it is Off.

```
public void LayerActive(string name, bool onoff)
```

**name** – Name for the layer to set active state for.

**onoff** – bool value for the new state of the layer.

Allows you to turn on or off scatter layers by name.

```
public void LayerActive(int i, bool onoff)
```

**i** – Index for the layer to set active state for.

**onoff** – bool value for the new state of the layer.

Allows you to turn on or off scatter layers by index.

```
public int FindLayerIndex(string name)
```

**name** – The layer name to get the index for.

Returns the index for the passed layer name. Returns -1 if name not found.

```
public void ReScatter()
```

Tells the Scatter object to re scatter.



```
public int GetLayerScatterCount(string name)
```

**name** – The layer name to get the count for.

Returns the count value for all the objects that were scattered for the layer. Can be used with GetLayerScatterPos to get the positions for all the objects that were placed in the scene.

```
public int GetLayerScatterCount(int i)
```

**i** – The layer index to get the count for.

Returns the count value for all the objects that were scattered for the layer. Can be used with GetLayerScatterPos to get the positions for all the objects that were placed in the scene.

```
public MegaScatterMeshInf GetLayer(string name)
```

**name** – The layer name to get the MegaScatterMeshInf data for.

Returns the MegaScatterMeshInf class for the named layer so the values can be altered.

```
public MegaScatterMeshInf GetLayer(int i)
```

**i** – The layer index to get the MegaScatterMeshInf data for.

Returns the MegaScatterMeshInf class for the indexed layer so the values can be altered.

```
public Vector3 GetLayerScatterPos(string name, int num)
```

**name** – The layer name to get the scatter position value for.

**num** – The index of the scattered object to get the position for. Use GetLayerScatterCount to get the max index value.

Returns the Vector3 value for the given object on the given layer, useful if you need to know where objects were placed.

```
public Vector3 GetLayerScatterPos(int i, int num)
```

**i** – The layer index to get the scatter position value for.

**num** – The index of the scattered object to get the position for. Use GetLayerScatterCount to get the max index value.

Returns the Vector3 value for the given object on the given layer, useful if you need to know where objects were placed.