

# itDD

## \_Introduction to Techniques in Digital Design

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## Deformers

Maya provides many types of deformers, which work in different ways. All of the deformers can deform anything with control points, including CVs on curves and surfaces, vertices on polygons, points on subdivision surfaces, and lattice points. Many deformers can also deform multiple surfaces, maintaining their tangency during the deformation process. All of the deformers and editing tools we will be covering can be found on the **Deform Menu** in the **Main Menu** with **Animation** selected from the pull-down menu in the **Status Line**.

## Lattices

A lattice is a structure of points for carrying out free-form deformations on any deformable object. To create deformation effects, you edit the lattice by moving, rotating, or scaling the lattice structure, or by directly manipulating the lattice points. In general, you create effects by editing any of the lattice deformer's attributes.

A lattice deformer includes two lattices: an **Influence Lattice** and a **Base Lattice**. By itself, the term "lattice" typically refers to the Influence Lattice. You create deformation effects by editing or animating the Influence Lattice. The lattice deformer's effect is based on any difference between the Base Lattice's lattice points and the Influence Lattice's lattice points. By default, the Base Lattice is hidden so that you can focus on manipulating the Influence Lattice. However, remember that the deformation effect depends on the relationship between the Influence Lattice and the Base Lattice.

Unique among deformer influence objects, lattices are deformable objects themselves. That means that one can create deformers that deform a lattice. For example, one can deform a lattice with a sculpt deformer, and the effect of the deformation on the lattice points will in turn deform the object the lattice is deforming. You can also assign deformation weights to lattice points by creating a cluster deformer for the lattice. Also, you can bind a lattice to a skeleton. When you move the skeleton, the lattice will deform with the action of the joints.

### Creating a Lattice Deformer:

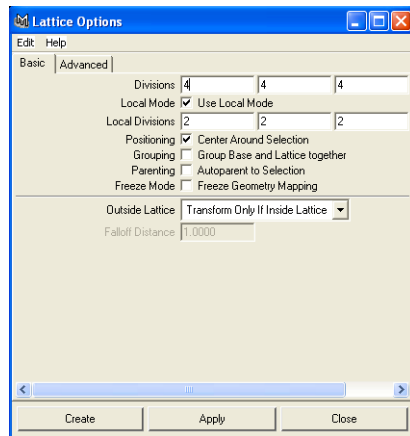
1. Select one or more Deformable objects
2. With the **Animation** Pull Down Menu selected in the **Status Line**, click *Deform* > *Create Lattice* (Options Dialog Box) in the **Main Menu**
3. Click the Basic and Advanced tabs and set the creation options. **Divisions (A)** specifies the structure of the lattice. When you specify the divisions, you also indirectly specify the number of lattice points in the lattice, because the lattice points are located where the divisions meet on the lattice's exterior. The greater the number of divisions, the greater the lattice point resolution.
4. Click Create to complete

### Editing Lattice Points:

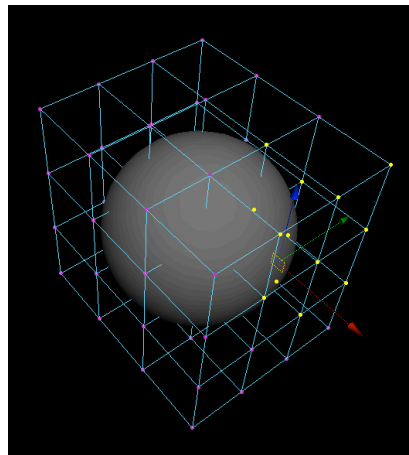
1. In Object Mode, select the **Lattice Deformer**
2. In Component Mode, select the **Lattice Points (B)**
3. Move (translate), rotate, or scale the points to change the effect of the deformation

### Resetting Lattice Tweaks:

1. In **Object Mode**, select the Lattice
2. With the **Animation** Pull Down Menu selected in the **Status Line**, click *Deform* > *Edit Lattice* > *Reset Lattice* in the **Main Menu**



(A)



(B)

## Wire Deformers

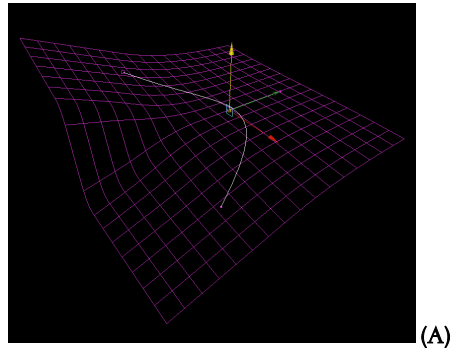
Wire deformation works with an **Influence Wire** and a **Base Wire**, like Lattice deformation. The deformation occurs according to the relative distance between the two wires.

### Creating a Wire Deformer:

1. Create the curve(s) you want to use as **Influence Wire**(s). For best results, place them on or near the deformable object(s).

2. With the **Animation** Pull Down Menu selected in the **Status Line**, click *Deform* > *Wire Tool* (Options Dialog Box) in the **Main Menu**
3. Select the object(s) that are to be deformed, and press the Enter Key.
4. Select all of the curves that are to be used as **Influence Wires**.
5. Press the Enter Key to complete

To create deformation effects with **Wire Deformers** select the **Influence Wire** in either **Object Mode** or **Component Mode** and manipulate it with the **Move**, **Scale** or **Rotate** Tool (A).



## Sculpt Deformer

Sculpt deformation uses a sphere as a sculpting tool to make round or flat ring-shaped deformations. It can deform objects in three different modes – **Flip**, **Project** and **Stretch**—using the appropriate settings. The **Max-Displacement** value determines the amount of strength with which the Sculpt Sphere can push or pull a deforming point. The **Dropoff Distance** setting determines the area of points that can be influenced.

When **Sculpt** is in **Flip** Mode, the **Sculpt Sphere** acts as if it has a force field, pushing points away from its center in the direction of the sphere's normal vector. If the **Sculpt Sphere**'s center crosses a point, there is a “flip”, because the point being pushed is suddenly pushed in the opposite direction.

**Sculpt**'s **Project** Mode is the opposite of the **Flip** Mode. In **Project** Mode, the **Sculpt Sphere** acts as a magnet, causing the influenced points to snap to it. A **Max-Displacement** value of 1 causes the points to snap to the sphere's surface; values between 0 and 1 cause the points to travel a percentage between their original position and the **Sculpt Sphere**'s surface.

In **Stretch Mode**, the **Sculpt Sphere** calculates its position relative to a **Sculpt Stretch Origin Locator**, which is created with the **Sculpt Sphere** and stretches the affected points away from the **Locator**.

### Creating a Sculpt Deformer:

1. Select one or more deformable objects.
2. With the **Animation** Pull Down Menu selected in the **Status Line**, click *Deform* > *Create Sculpt Deformer* (Options Dialog Box) in the **Main Menu**
3. Click the Basic and Advanced tabs and set the creation options.
4. Click Create to complete

### Using a NURBS surface with the Sculpt Deformer

1. Select the object to deform, and then the NURBS surface to use as a sculpting tool.
2. With the **Animation** Pull Down Menu selected in the **Status Line**, click *Deform* > *Create Sculpt Deformer* (Options Dialog Box) in the **Main Menu**
3. Turn on Use Secondary Object as Sculpt Tool.
4. Click Create to complete