Chapter 2

Sculpting Brushes

Learning Objectives

After completing this chapter, you will be able to:

- *Understand digital sculpting*
- *Work with different types of sculpting brushes*



INTRODUCTION

Digital sculpting in ZBrush offers a very efficient and artistic way to create models. It allows you to add subtle details to 3D models which help in achieving photorealistic and hyperrealistic outputs. Furthermore, in ZBrush, Dynamics system is used along with special cloth sculpting brushes. These brushes use the Dynamics engine to give unique capabilities for interacting with the cloth surface. In this chapter, you will learn about the use of different brushes in sculpting.

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SCULPTING BRUSHES



The sculpting brushes are used to modify the shape of a 3D model. These brushes push, pull, smoothen, grab, and pinch a 3D model depending on the type of brush chosen. ZBrush contains an extensive library of brushes. Before using these brushes, you need to create a 3D primitive object or load a model from the **LightBox** browser. After creating a 3D primitive object or loading a model, you need to choose the **Edit** button in the top shelf. If this button is not chosen, then ZBrush will be in the paint mode and drawing on the canvas will simply create copies of the 3D model in the canvas.

The different brushes in ZBrush can be accessed either from the **Brush** palette located at the top of the interface or using the Current Brush button from the left shelf, refer to Figures 2-1 and 2-2. Before using any brush, you can change its settings in the **Brush** palette. In addition to this, you can also modify the brush size and depth by using the settings in the top shelf, refer to Figure 2-3.



Note

*Some of the brushes are available in the **Brush** tab of the **LightBox** browser such as **IMM Bricks.ZBP**, **InsertHCylinder.ZBP**, **InsertRing.ZBP**, and so on.*

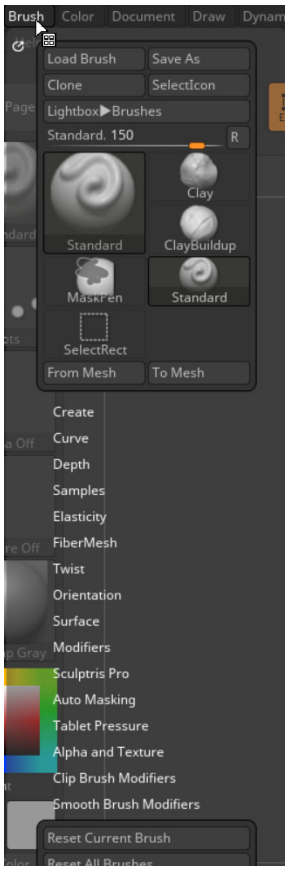


Figure 2-1 *Partial view of the **Brush** palette in the top shelf*

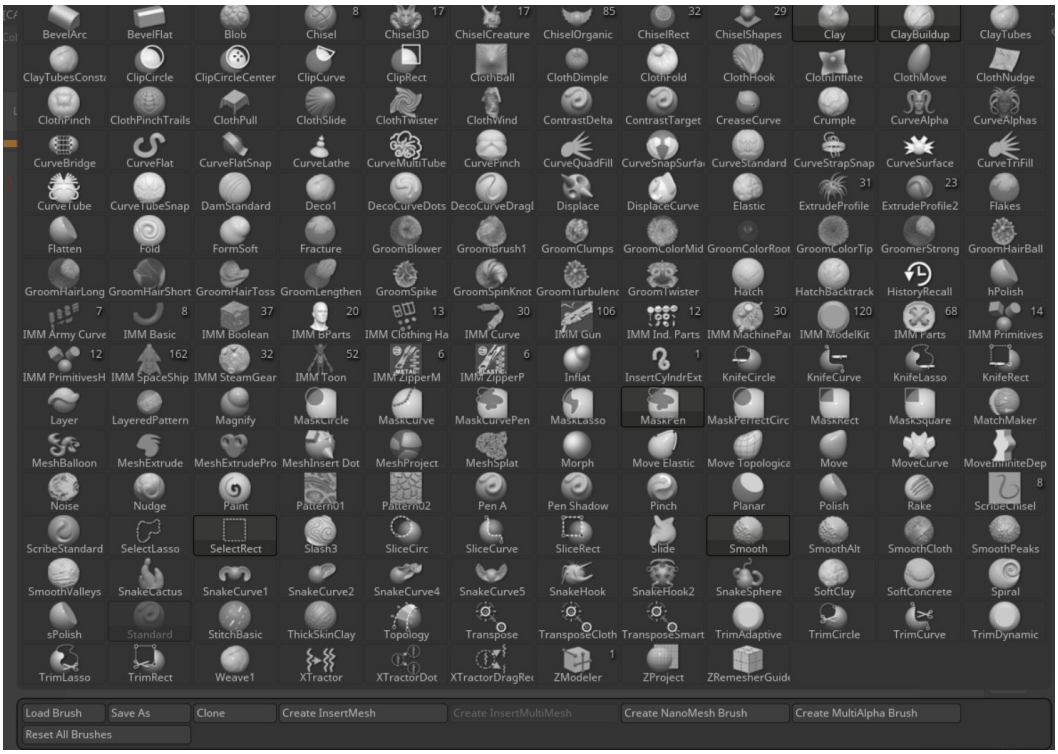


Figure 2-2 *The brushes accessed from the left shelf on choosing the Current Brush button*



Figure 2-3 *The different brush settings in the top shelf*

After creating a 3D primitive object in the canvas, it should be converted into a polymesh. Polymesh is a collection of polygons or faces that form the surface of a mesh. When you drag a brush on a 3D primitive object, a message box will be displayed, prompting you to convert the 3D primitive object into polymesh, refer to Figure 2-4. You can also import 3D models created in external software applications. These 3D models are imported as polymeshes. The sculpting, texturing, and mapping can only be done on the polymeshes. To convert a 3D primitive object into a polymesh, choose the **Make PolyMesh3D** button from the **Tool** palette, refer to Figure 2-5. After converting a 3D primitive object into polymesh, you can increase the number of polygons so that you can sculpt easily at different resolutions. Most commonly used sculpting brushes in ZBrush are discussed next.



Figure 2-4 *Message box displayed on using a brush on a 3D primitive object*

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Note

Before using the brushes on a polymesh, it is recommended to increase the number of polygons in the object. For achieving a greater level of detail on the object, you need to have larger number of polygons. When you place an object on the canvas, it has lower number of polygons. If you start sculpting on low poly objects, the output will not carry a high level of detail. To increase the number of polygons in the object, expand the ***Geometry*** *subpalette in the* ***Tool*** *palette, and then choose the* ***Divide*** *button.*

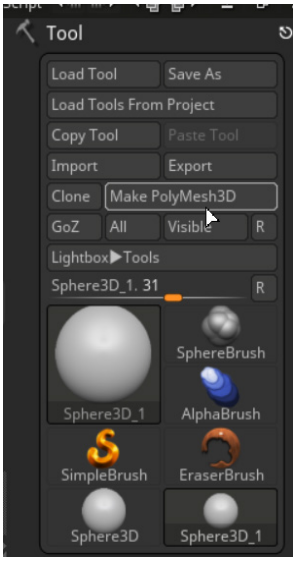


Figure 2-5 *The* ***Make PolyMesh3D*** *button in the* ***Tool*** *palette*

BevelArc Brush

The **BevelArc** brush is used to sculpt a round bevel shape along an edge. To sculpt using this brush, first create a 3D primitive object in the canvas. To do so, choose the Current Tool button from the **Tool** palette; a flyout will be displayed, refer to Figure 2-6. Choose the **Cube3D** primitive from this flyout. Next, press and hold the left mouse button and drag the cursor on the canvas to create a cube. After creating the cube, choose the **Edit** button from the top shelf and then choose the **Make PolyMesh3D** button from the **Tool** palette; the primitive object will be converted into a polymesh. Next, expand the **Geometry** subpalette in the **Tool** palette, and then choose the **Smt** button to deactivate it. Now, click thrice on the **Divide** button.



Figure 2-6 *Flyout displayed on choosing the Current Tool button*

Choose the Current Brush button from the left shelf; a flyout containing different sculpting brushes will be displayed. Choose the **BevelArc** brush from this flyout. If required, adjust the

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size of the brush using the '[' or ']' keys. Next, click on the cube at both sides of an edge which you want to bevel, refer to Figure 2-7. Next, move the brush back and forth all over across the edge to get the desired bevel shape, refer to Figure 2-8. Note that you also need to adjust the **Draw Size** slider in the top shelf to get the desired bevel shape.

You can also choose the **Activate Symmetry** button in the **Transform** Palette and then you can choose the **X**, **Y**, or **Z** button depending on the axis along which the symmetrical edges need to be beveled. You need to use the **R** button for activating the radial symmetry.

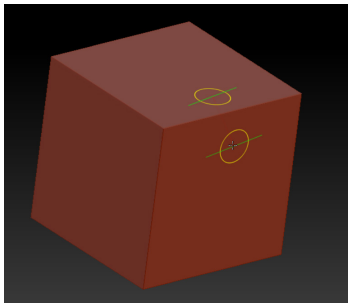


Figure 2-7 *Clicking on the mesh at both sides of the edge*

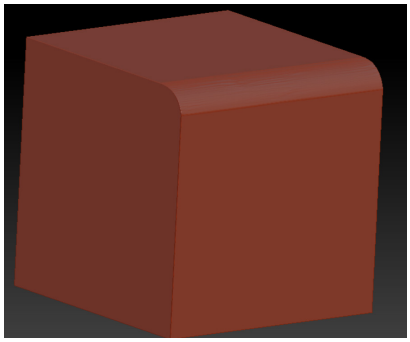


Figure 2-8 *Arc bevel shape created across the edge*



Note

You will know about the Symmetry feature in the ***Transform*** *palette in detail in Chapter 3.*

BevelFlat Brush

The **BevelFlat** brush is used to sculpt a flat bevel shape along an edge. To sculpt using this brush, first create a 3D primitive object in the canvas. To do so, choose the Current Tool button from the **Tool** palette; a flyout will be displayed, refer to Figure 2-6. Choose the **Cube3D** primitive from this flyout. Next, press and hold the left mouse button and drag the cursor on the canvas to create a cube. After creating the cube, choose the **Edit** button from the top shelf and then choose the **Make PolyMesh3D** button from the **Tool** palette; the primitive object will be converted into a polymesh. Next, expand the **Geometry** subpalette in the **Tool** palette, and then choose the **Smt** button to deactivate it. Now, click thrice on the **Divide** button.

Choose the Current Brush button from the left shelf; a flyout containing different sculpting brushes will be displayed. Choose the **BevelFlat** brush from this flyout. If required, adjust the size of the brush using the '[' or ']' keys. Next, click on the cube at both sides of the edge which you want to bevel, refer to Figure 2-7. Next, move the brush back and forth all over across the edge to get the desired flat bevel shape, refer to Figure 2-9. Note that you also need to adjust the value in the **Draw Size** slider in the top shelf to get the desired bevel shape.

You can also choose the **Activate Symmetry** button in the **Transform** Palette and then you can choose the **X**, **Y**, or **Z** button depending on the axis along which the symmetrical edges need to be beveled. You need to use the **R** button for activating the radial symmetry.

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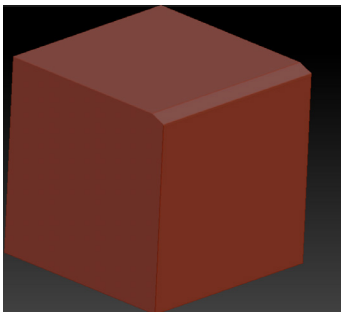


Figure 2-9 *Flat bevel shape created across the edge*

Blob Brush



The **Blob** brush is used to add organic details to an object. This brush is ideal for creating fungus on the surface of an object. To sculpt using this brush, first create a 3D primitive object in the canvas. To do so, choose the Current Tool button from the **Tool** palette; a flyout will be displayed, refer to Figure 2-6. Choose the **Sphere3D** primitive from this flyout. Next, press and hold the left mouse button and drag the cursor on the canvas to create a sphere. After creating the sphere, choose the **Edit** button from the top shelf and then choose the **Make PolyMesh3D** button from the **Tool** palette; the primitive object will be converted into a polymesh. Next, expand the **Geometry** subpalette in the **Tool** palette, and then click thrice on the **Divide** button; the sphere will become smoother as more polygons are added, refer to Figure 2-10.

Choose the Current Brush button from the left shelf; a flyout containing different sculpting brushes will be displayed. Choose the **Blob** brush from this flyout. If required, adjust the size of the brush using the [or] key (square bracket key). Next, press and hold the left mouse button, and drag the cursor on the surface of the sphere; the shape of the sphere will be modified and will become blobby, refer to Figure 2-11.

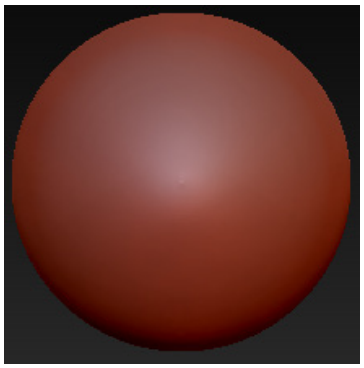


Figure 2-10 *The sphere smoothened*

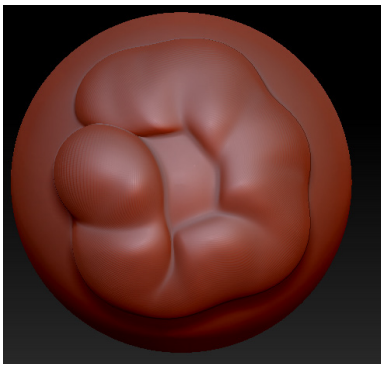


Figure 2-11 *Shape of the sphere modified using the **Blob** brush*

Clay Brushes

There are four types of Clay brushes, namely **Clay**, **ClayBuildup**, **ClayTubes**, and **ClayTubes Constant**, as shown in Figure 2-12. These brushes are discussed next.

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Clay Brush

The **Clay** brush is used to add detail and depth to an object by using different alphas, refer to Figure 2-13. On choosing the **Zadd** button, the lump of clay will be created on a sculpture and an effect will be created as if the sculpture scooped on the clay has been taken off, choosing the **Zsub** button.

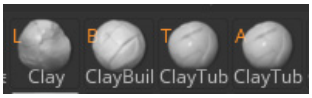


Figure 2-12 *The clay brushes*



Figure 2-13 *Patterns created using different alphas*

ClayBuildup Brush

The **ClayBuildup** brush is used to increase the volume of an object significantly. On choosing this brush, a rectangular alpha gets automatically assigned to it. You can also choose other alpha images from the flyout displayed on choosing the Current Alpha button from the left shelf. To increase the volume of an object using this brush, press and hold the left mouse button and drag the cursor continuously on the surface of the object, refer to Figure 2-14.

ClayTubes Brush

The **ClayTubes** brush is similar to the **ClayBuildup** brush with the only difference that it does not produce displacement in the surface of the object, refer to Figure 2-15. On choosing this brush, a rectangular alpha gets automatically assigned to it. It gives an effect similar to an effect produced when a wooden tool is used on the surface of a wet lump of clay.

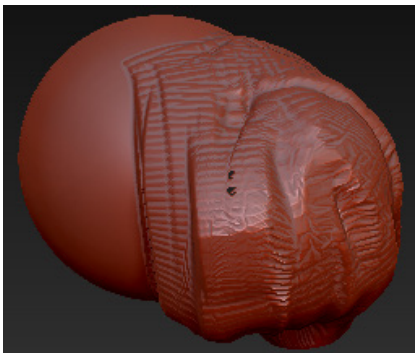


Figure 2-14 *Volume of the sphere increased using the* ***ClayBuildup*** *brush*

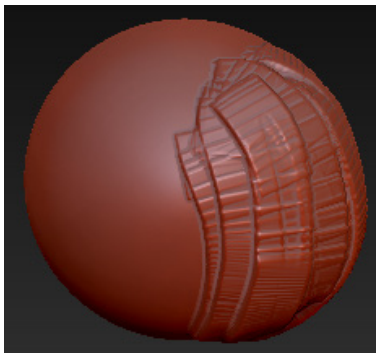


Figure 2-15 *Volume of the sphere increased using the* ***ClayTubes*** *brush*

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ClayTubes Constant Brush

The **ClayTubes Constant** brush is similar to the **ClayTubes** brush with the only difference that it keeps the sample rate of radius at a constant rate.

Cloth Brushes

ZBrush has special cloth brushes to control cloth sculpting. These special brushes are used to work on dynamic cloth surface. By using these brushes, you can create the folds or can freely move into the geometry as per the requirements, refer to Figure 2-16. There are thirteen types of cloth brushes, namely **ClothBall**, **ClothDimple**, **ClothFold**, **ClothHook**, **ClothInflate**, **ClothMove**, **ClothNudge**, **ClothPinch**, **ClothPinchTrail**, **ClothPull**, **ClothSlide**, **ClothTwister**, and **ClothWind**, refer to Figure 2-17. These brushes are discussed next.



Figure 2-16 *Creating folds using cloth brushes in the scene*



Figure 2-17 *The **Cloth** brushes*

ClothBall Brush

The **ClothBall** brush is used to expand the surface of an object to a significant amount by pulling the polygons in a direction perpendicular to the surface. To sculpt using this brush, choose the **LightBox** button from the top shelf; the LightBox browser will be displayed. Next, choose the **Tool** tab in the LightBox browser. Next, double-click on the **DemoSoldier**. **ZTL** file in the LightBox browser; the model will be created in the canvas, as shown in Figure 2-18. Make sure the **Edit** button from the top shelf is chosen. Choose the **Geometry** subpalette in the **Tool** palette and choose the **Dynamic** button from the ***Dynamic Subdiv*** area. Next, choose the Current Brush button from the left shelf; a flyout containing different sculpting brushes will be displayed. Choose the **ClothBall** brush from this flyout. Expand the **SubTool** subpalette in the **Tool** palette. Now, choose **vest** from the list. Notice that the shirt is selected in the canvas area. Now, use the **ClothBall** brush to sculpt both hands of the shirt, as shown in Figure 2-19.

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Figure 2-18 *The* ***DemoSoldier.ZTL*** *file*



Figure 2-19 *Sculpting both hands of the shirt by using the* ***ClothBall*** *brush*

ClothDimple Brush

The **ClothDimple** brush is used to create a small hollow portion on the surface of an object. For example, by using this brush you can create button on a pillow. To sculpt using this brush, first create a 3D primitive object in the canvas. Choose the **Edit** button from the top shelf and then choose the **Make PolyMesh3D** button from the **Tool** palette; the primitive object will be converted into a polymesh. Next, expand the **Geometry** subpalette in the **Tool** palette, and then click on the **Dynamic** button in the **Dynamic Subdiv** area; the sphere will become smoother as more polygons are added. Choose the Current Brush button from the left shelf; a flyout containing different sculpting brushes will be displayed. Choose the **C** tab from the flyout; a list of brush starting with C will be displayed. Choose the **ClothDimple** brush from this flyout. If required, adjust the size of the brush using the [or] key (square bracket key). Next, press and hold the left mouse button, and drag the cursor on the surface of the sphere; the surface of the sphere will be modified and wrinkled, refer to Figure 2-20.

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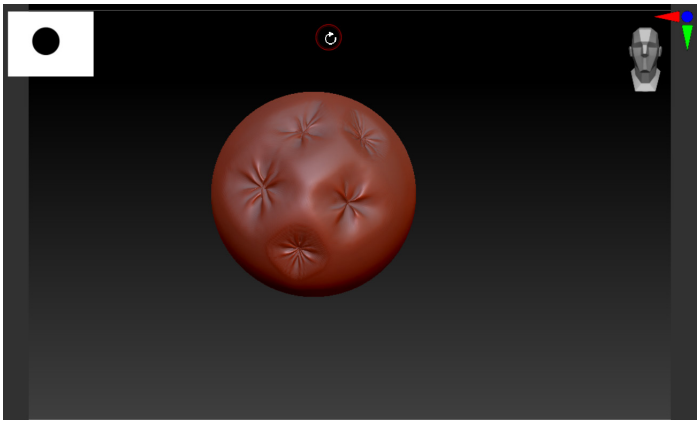


Figure 2-20 *The modified sphere using the* ***ClothDimple*** *brush*

ClothFold Brush

The **ClothFold** brush is used to create wrinkles and folds on the surface of an object. By using this brush, you can create wrinkles on a cloth, as shown in Figure 2-21.

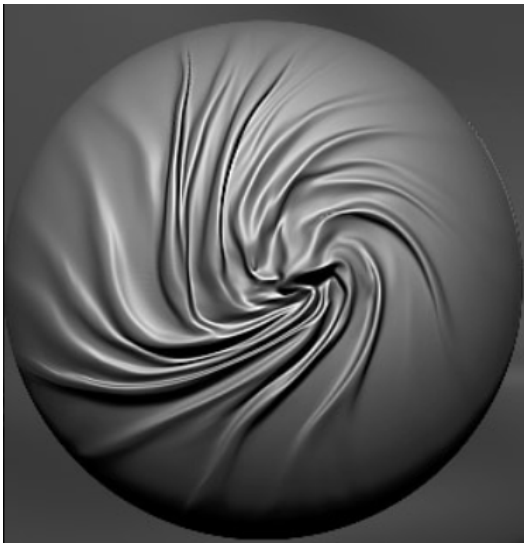


Figure 2-21 *The sculpted object using the* ***ClothFold*** *brush*

ClothHook Brush

To create an effect as if a cloth is grabbed, held, or dragged, choose the **ClothHook** brush. By using this brush, you can create the hanging cloth model, refer to Figure 2-22.

ClothInflate Brush

The **ClothInflate** brush is used to create an effect of covering an object by cloth. Figure 2-23 shows the sculpted object using the **ClothInflate** brush.

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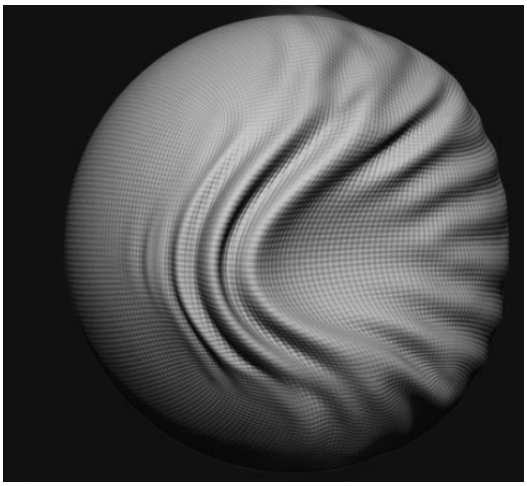


Figure 2-22 *The sculpted object using the* ***ClothHook*** *brush*

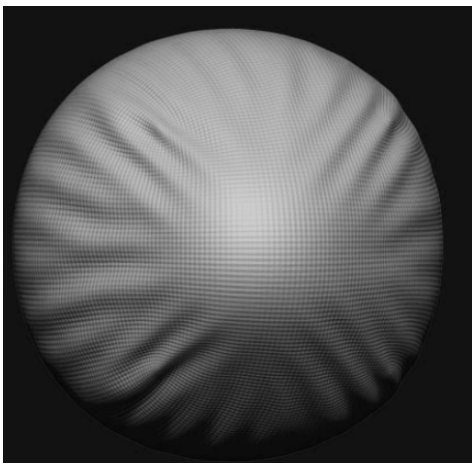


Figure 2-23 *The sculpted object using the* ***ClothInflate*** *brush*

ClothMove Brush

The **ClothMove** brush is used to control the stretching of cloth during the cloth simulation in Dynamic system, refer to Figure 2-24.

ClothNudge Brush

The **ClothNudge** brush is used to create ripples on the surface of an object. Figure 2-25 shows the sculpted object using the **ClothNudge** brush.

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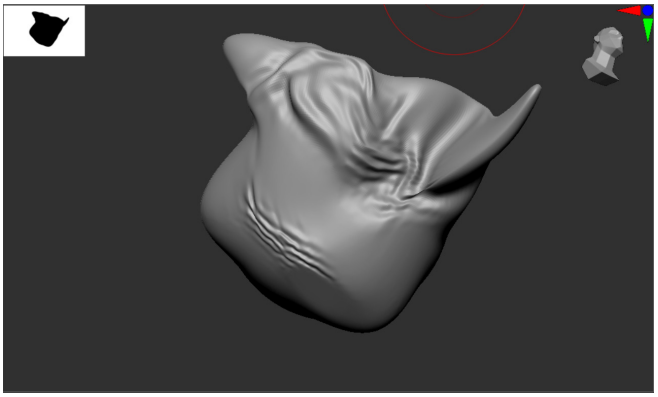


Figure 2-24 *The sculpted object using the* ***ClothMove*** *brush*

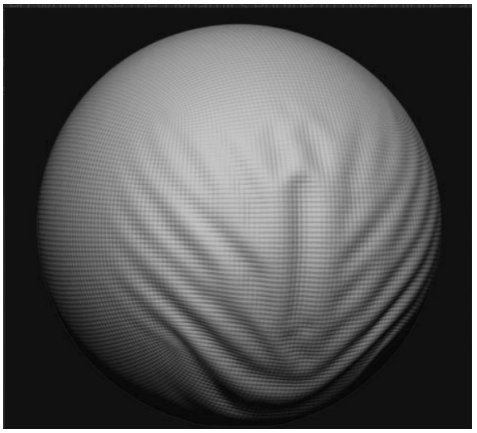


Figure 2-25 *The sculpted object using the* ***ClothNudge*** *brush*

ClothPinch Brush

The **ClothPinch** brush is used to create a crease on the surface of an object by pulling the surface. To sculpt using this brush, first create a 3D primitive object in the canvas. Next, make sure the **Edit** button is chosen from the top shelf. Choose the **Geometry** subpalette in the **Tool** Palette and choose the **Dynamic** button in the **Dynamic Subdiv** area. Next, choose the Current Brush button from the left shelf; a flyout containing different sculpting brushes will be displayed. Choose the **ClothPinch** brush from this flyout. Now, sculpt on an object using this brush, refer to Figure 2-26. Hold the ALT key to reverse the direction of the crease relative to the surface.

ClothPinchTrial Brush

The **ClothPinchTrial** brush is used to repeat the pinching along the path of the stroke on the object. By using this brush, you can create wrinkles in objects like pillows or wounds and scars in skin.

To sculpt using this brush, first create a 3D primitive object in the canvas. Next, make sure the **Edit** button is chosen from the top shelf. Choose the **Geometry** subpalette in the **Tool** Palette and choose the **Dynamic** button in the **Dynamic Subdiv** area. Next, choose the

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Current Brush button from the left shelf; a flyout containing different sculpting brushes will be displayed. Choose the **ClothPinchTrial** brush from this flyout. Now, sculpt on an object using this brush, refer to Figure 2-27. Hold the ALT key to reverse the direction of the crease relative to the surface.

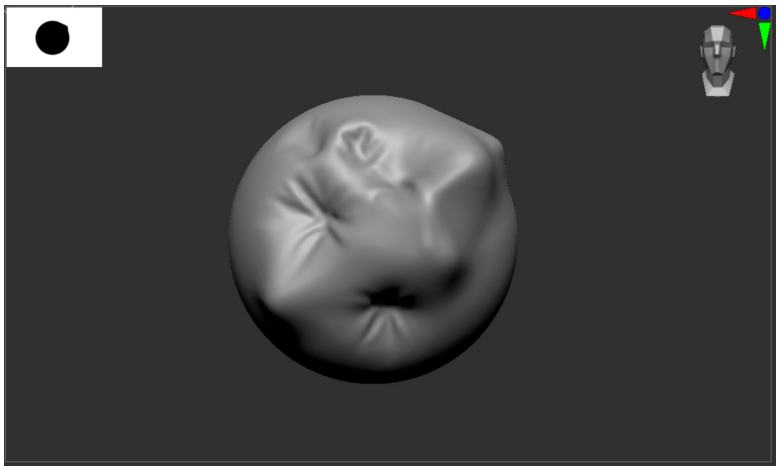


Figure 2-26 *The sculpted object using the* ***ClothPinch*** *brush*

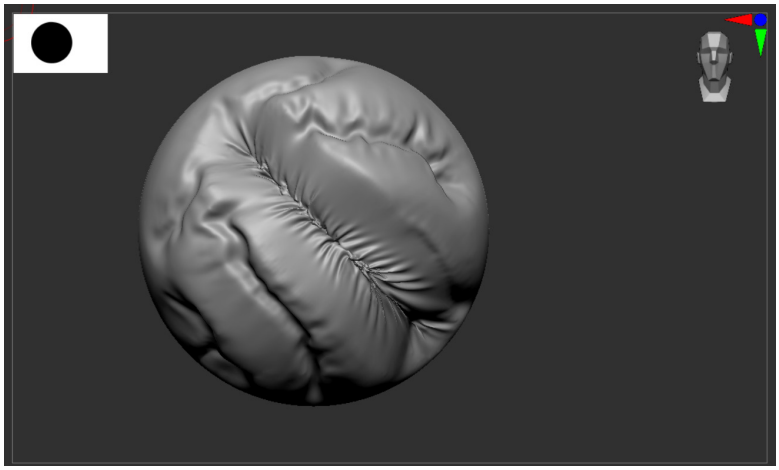


Figure 2-27 *The sculpted object using the* ***ClothPinchTrail*** *brush*

ClothPull Brush

The **ClothPull** brush is used to drag the surface of object to control the cloth drapes. To sculpt using this brush, first create a 3D primitive object in the canvas. Make sure the **Edit** button is chosen from the top shelf. Choose the **Geometry** subpalette in the **Tool** Palette and choose the **Dynamic** button. Next, choose the Current Brush button from the left shelf; a flyout containing different sculpting brushes will be displayed. Choose the **ClothPull** brush from this flyout. Now, sculpt on an object using this brush, refer to Figure 2-28.

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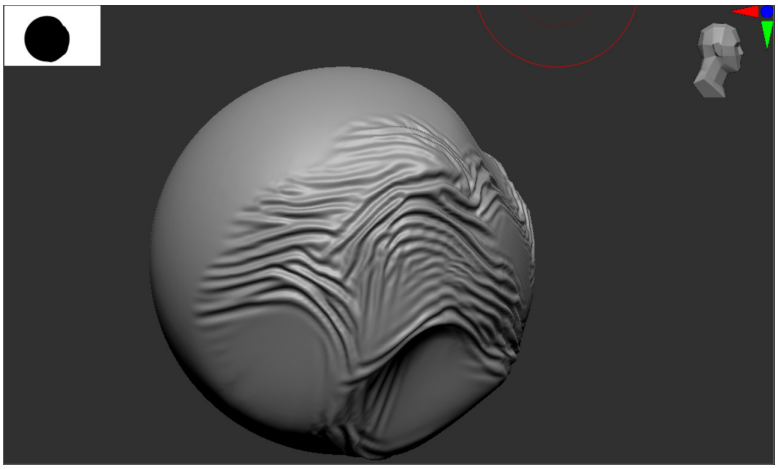


Figure 2-28 *The sculpted object using the* ***ClothPull*** *brush*

ClothSlide Brush

The **ClothSlide** brush is used to create multiple folds on the surface of the object. Hold the ALT key to indent the surface. Figure 2-29 shows the sculpted object using the **ClothSlide** brush.

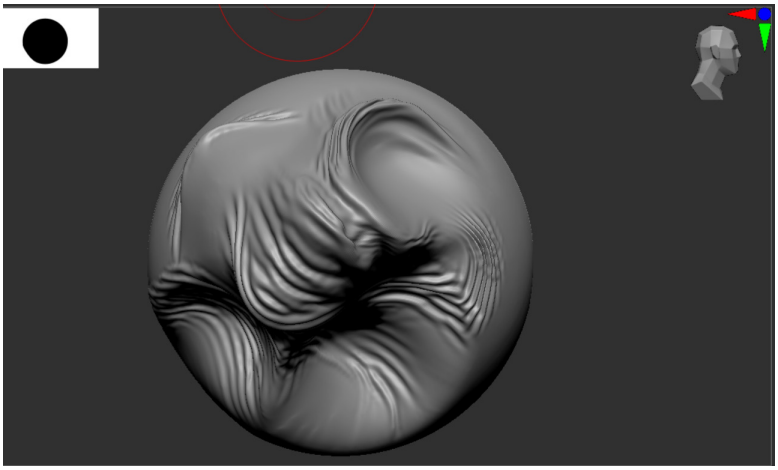


Figure 2-29 *The sculpted object using the* ***ClothSlide*** *brush*

ClothTwister Brush

The **ClothTwister** brush is used to twist the surface of an object in circular motion. Use negative value to twist in the opposite direction. To sculpt using this brush, first create a 3D primitive object in the canvas. Make sure the **Edit** button is chosen from the top shelf. Choose the **Geometry** subpalette in the **Tool** Palette and choose the **Dynamic** button. Next, choose the Current Brush button from the left shelf; a flyout containing different sculpting brushes will be displayed. Choose the **ClothTwister** brush from this flyout. Now, sculpt on an object using this brush, refer to Figure 2-30.

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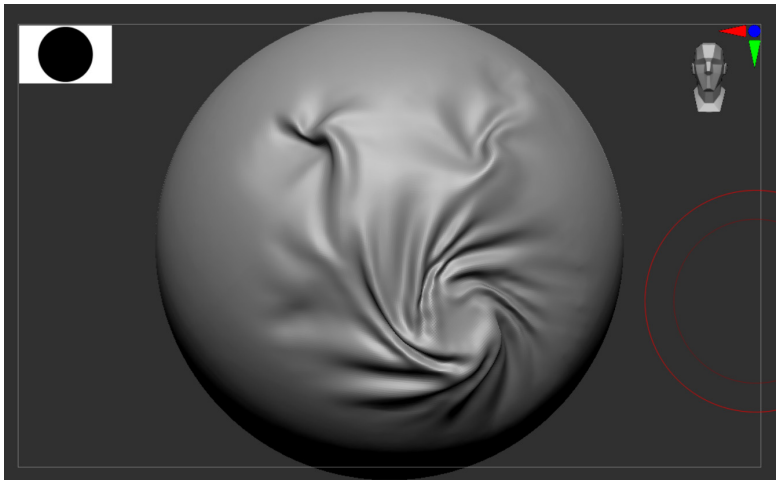


Figure 2-30 *The sculpted object using the* ***ClothTwister*** *brush*

ClothWind Brush

The **ClothWind** brush is used to create an effect as if the cloth is being blown on. By using this brush, you can create natural effects on loose fabrics. To sculpt using this brush, first create a 3D primitive object in the canvas. Next, make sure the **Edit** button is chosen from the top shelf. Choose the **Geometry** subpalette in the **Tool** Palette and choose the **Dynamic** button in the **Dynamic Subdiv** area. Next, choose the Current Brush button from the left shelf; a flyout containing different sculpting brushes will be displayed. Choose the **ClothWind** brush from this flyout. Now, sculpt on an object using this brush, refer to Figure 2-31.

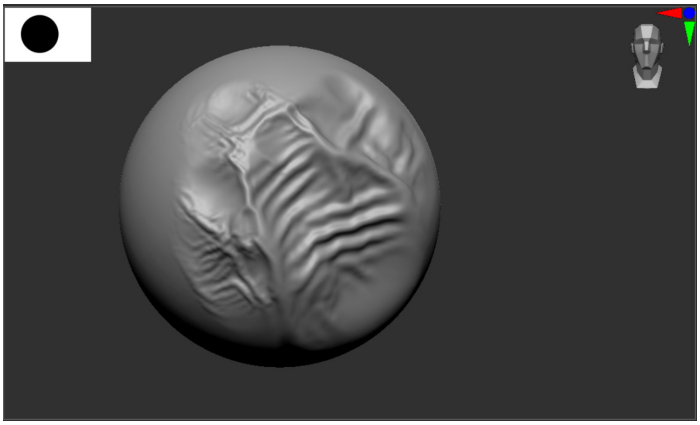


Figure 2-31 *The sculpted object using the* ***ClothWind*** *brush*

Clip Brushes

The **Clip** brushes are used to slice a particular area of a 3D model, without deleting the polygons in that model. Instead, these brushes squash and squeeze the polygons, without affecting the number of polygons in an object. There are four types of Clip brushes, namely **ClipCircle**, **ClipCircleCenter**, **ClipCurve**, and **ClipRect**, refer to Figure 2-32. These brushes are discussed next.

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Figure 2-32 *The **Clip** brushes*

ClipCircle Brush

The **ClipCircle** brush uses a circular or elliptical stroke as a mask to squeeze the polygons. By using this brush, all the polygons that lie outside of the mask will be pushed to the border of the mask. The resulting object will have hard edges.

To squeeze the polygons of the 3D model, choose the Current Brush button from the left shelf; a flyout containing different sculpting brushes will be displayed. Choose the **ClipCircle** brush from this flyout; a message box prompting you to press CTRL+SHIFT to use this brush will be displayed, refer to Figure 2-33. Choose the **OK** button in this message box. Press and hold CTRL+SHIFT and then drag the cursor on the surface of the sphere; a marquee selection will be displayed, refer to Figure 2-34. Next, release the left mouse button; the shape of the sphere will be modified, as shown in Figure 2-35.

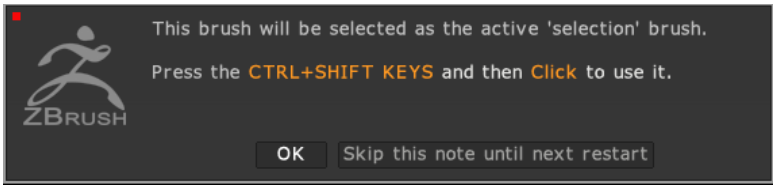


Figure 2-33 *The message box displayed on choosing the **ClipCircle** brush*

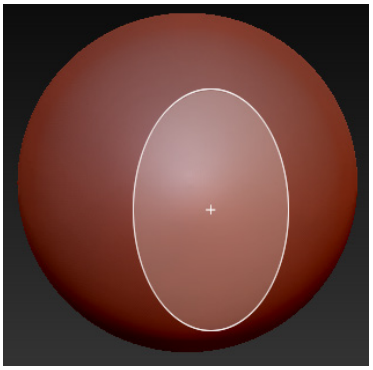


Figure 2-34 *A elliptical marquee selection displayed*

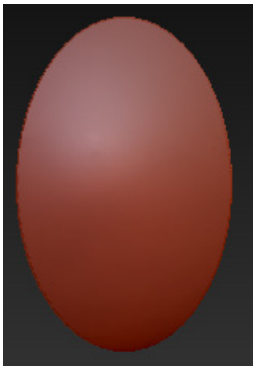


Figure 2-35 *The shape of the sphere modified*

ClipCircleCenter Brush

The **ClipCircleCenter** brush is similar to the **ClipCircle** brush, with the only difference that the brush stroke creates a perfect circular marquee selection as a mask, with its center point originating from the position where you first clicked and began dragging the cursor, refer to Figure 2-36. Figure 2-37 shows the shape of the sphere modified by using this brush.

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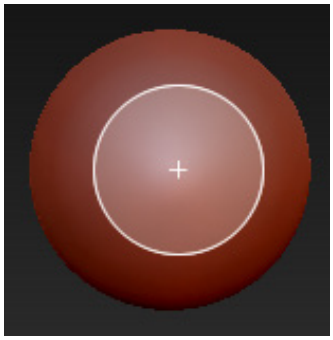


Figure 2-36 *A circular marquee selection displayed*

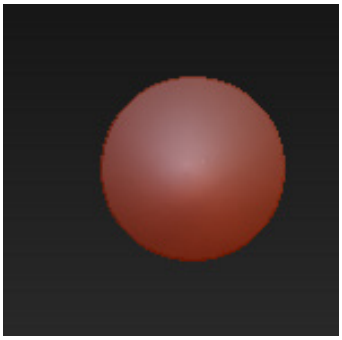


Figure 2-37 *The shape of the sphere modified*

ClipCurve Brush

The **ClipCurve** brush uses curves or straight lines to squeeze in the polygons. To invoke this brush, choose the Current Brush button from the left shelf; a flyout containing different sculpting brushes will be displayed. Choose the **ClipCurve** brush from this flyout; a message box prompting you to press CTRL+SHIFT to use this brush will be displayed. Choose the **OK** button in this message box. Press and hold CTRL+SHIFT and then drag the cursor on the surface of the sphere starting from top to bottom; a straight line with grey highlighted area around it will be displayed on the surface of the sphere, refer to Figure 2-38. Release the left mouse button; the shape of the sphere will be modified, as shown in Figure 2-39.

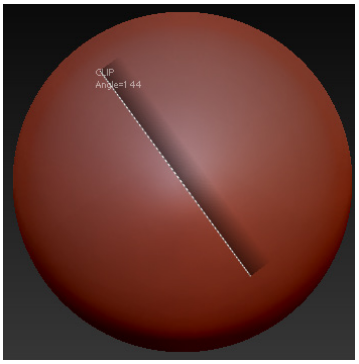


Figure 2-38 *A straight line displayed on the surface of the sphere*



Figure 2-39 *Shape modified by using the **ClipCurve** brush*

You can change the position of the line by pressing SPACEBAR along with CTRL+SHIFT. In Figure 2-39, you will notice that the polygons in the direction of the grey highlighted area will be squeezed toward the line. On pressing the ALT key along with CTRL+SHIFT, a curved line will be created instead of the straight line, refer to Figure 2-40. On releasing the left mouse button, the polygons that are not in the direction of the grey highlighted area will be squeezed in, refer to Figure 2-41.

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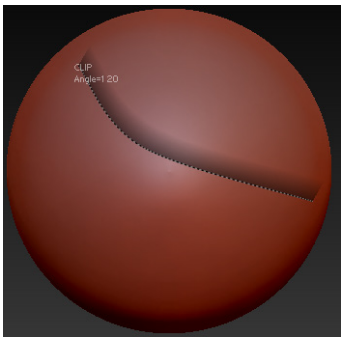


Figure 2-40 *A curved line displayed on the surface of the sphere*

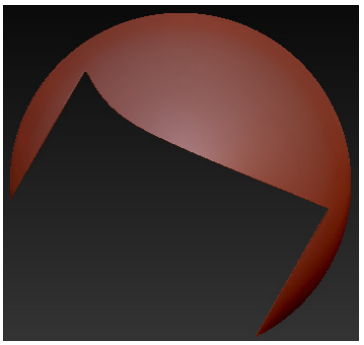


Figure 2-41 *Shape modified by using the* ***ClipCurve*** *brush along with ALT*

ClipRect Brush

The **ClipRect** brush works similar to the **ClipCircle** brush with the only difference that it uses a rectangular marquee selection to squeeze in the polygons, refer to Figures 2-42 and 2-43.

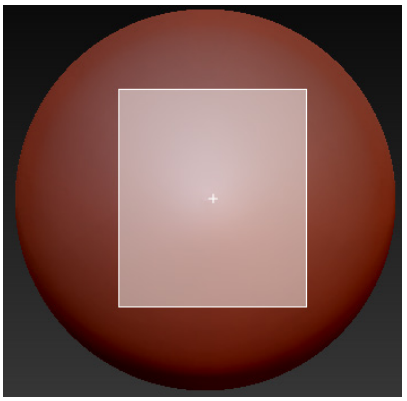


Figure 2-42 *A rectangular marquee selection displayed*

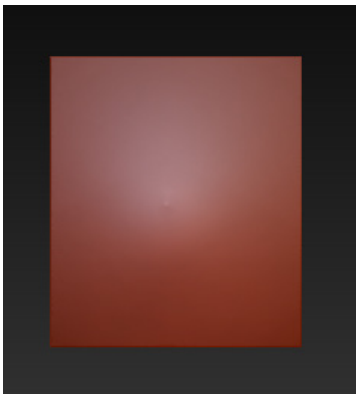


Figure 2-43 *The shape of the sphere modified*

CreaseCurve Brush



The **CreaseCurve** brush uses straight lines to create a creased edge on the surface of the 3D object. To invoke this brush, choose the Current Brush button from the left shelf; a flyout containing different sculpting brushes will be displayed. Choose the **CreaseCurve** brush from this flyout; a message box prompting you to press CTRL+SHIFT to use this brush will be displayed. Choose the **OK** button in this message box. Press and hold CTRL+SHIFT and then drag the cursor on the surface of the sphere starting from left to right; a straight line with grey highlighted area around it will be displayed on the surface of the sphere, refer to Figure 2-44. Release the left mouse button; the creased edge will be created, refer to Figure 2-45.

Crumple Brush



The **Crumple** brush is used to create creases on the surface of a 3D object, as shown in Figure 2-46. This brush can be used to create wrinkles on skin or clothes.

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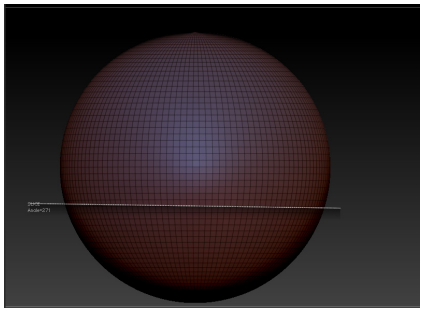


Figure 2-44 *A straight line with grey area*

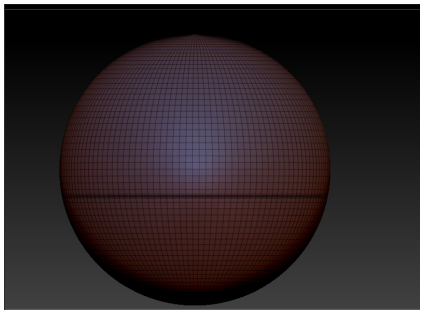


Figure 2-45 *The creased edge created on the sphere*

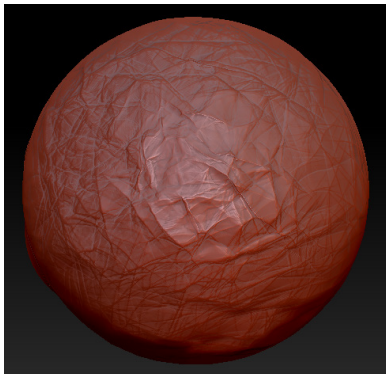


Figure 2-46 *A pattern created using the* ***Crumple*** *brush*

Curve Brushes

There are twenty one types of Curve brushes available in ZBrush, refer to Figure 2-47. Sixteen brushes are in the flyout that is displayed on choosing the Current Brush button and five brushes are placed in the **Brush** tab of the **LightBox** browser. The Curve brushes are used to create different curve patterns on a mesh. Most commonly used curve brushes are discussed next.



Figure 2-47 *The Curve brushes*



Note

Before using some of the curve brushes, you need to freeze the subdivision levels of the object. This can be done by choosing the ***Del Lower*** *button from the* ***Geometry*** *subpalette of the* ***Tool*** *palette.*

CurveBridge Brush

The **CurveBridge** brush is used to create a bridge geometry between two curves. To sculpt using this brush, choose the Current Brush button from the left shelf; a flyout containing

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different sculpting brushes will be displayed. Choose the **CurveBridge** brush from this flyout. Create a curve on the first sphere and then create another curve on the second sphere; the bridge geometry will be created between two curves on the surface of the spheres, as shown in Figure 2-48.

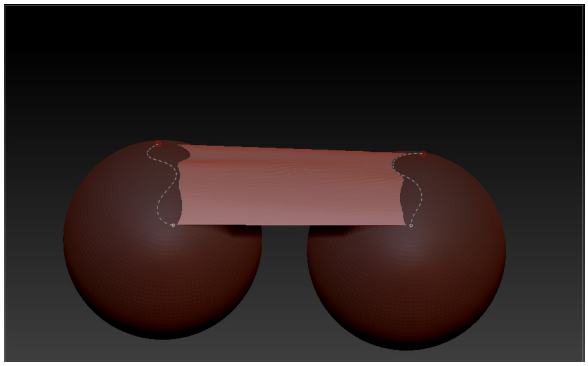


Figure 2-48 *The bridge geometry created between two curves*

CurveLathe Brush

The **CurveLathe** brush is used to create different shapes on the surface of the object. Before using this brush, make sure that the value in the **SDiv** slider is set to 1 or the geometry has not been subdivided. If you use this brush on a mesh which has been subdivided, a message box will be displayed, as shown in Figure 2-49.

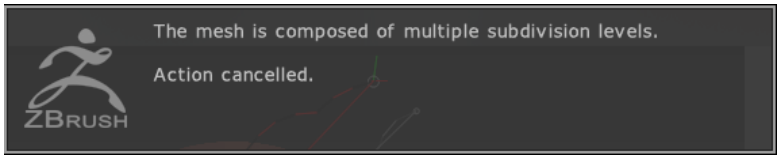


Figure 2-49 *The message box displayed on using the* ***CurveLathe*** *brush on a subdivided mesh*

To use this brush, create a plane in the canvas and convert it into polymesh. Choose the Current Brush button from the left shelf; a flyout containing different sculpting brushes will be displayed. Choose the **CurveLathe** brush from this flyout. Next, press and hold the left mouse button, and drag the cursor on the surface of the object to create the shape of your choice; a profile curve indicating the shape of the new mesh will be displayed, refer to Figure 2-50. Now, release the left mouse button; a new mesh will be created on the surface, as shown in Figure 2-51.

You can move, scale, and rotate the newly created mesh by choosing the **Move**, **Scale**, and **Rotate** buttons, respectively from the top shelf. You can also create a duplicate copy of the mesh. To do so, choose the **Move** button from the top shelf. Press and hold the left mouse button and drag the cursor on the surface of the mesh and then release the left mouse button; a line with three circles will be displayed, refer to Figure 2-52. Press and hold the CTRL key and the left mouse button and hover the cursor over the middle circle. Next, drag the cursor toward right; a duplicate copy of the mesh will be created, refer to Figure 2-53.

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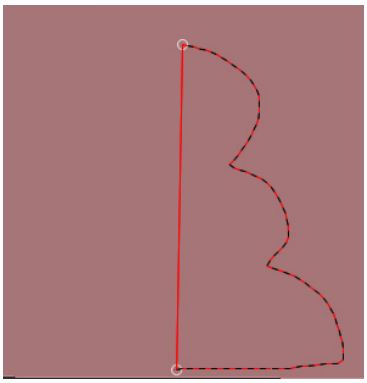


Figure 2-50 *A profile curve created on the surface of plane*

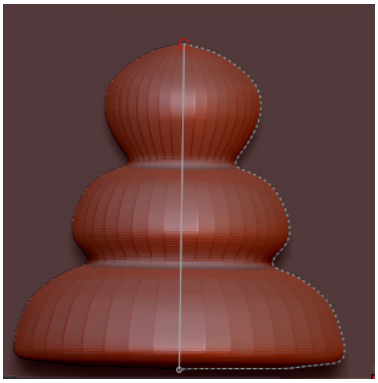


Figure 2-51 *A new mesh created along the profile curve*

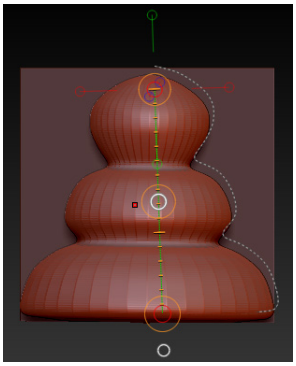


Figure 2-52 *A line with three circles displayed*

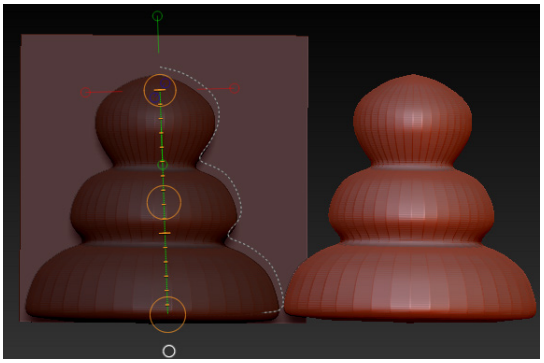


Figure 2-53 *The duplicate copy of the mesh created*

On creating a new mesh using this brush, you will notice that the color of the plane changes to grey and a mask is applied to it. To remove the mask, press and hold the CTRL key, and drag the cursor in the canvas area. After removing the mask, you cannot move, scale, or rotate the new mesh.

CurveLine Tube Brush

The **CurveLine Tube** brush is used to create a tube on the surface of an object along a straight line, refer to Figure 2-54. This brush does not work on the subdivided geometry. The **CurveLine Tube** brush is located in the **Brush** tab of the **LightBox** browser.

CurveMultiLathe Brush

The **CurveMultiLathe** brush is used to create multiple shapes on the surface of the object by drawing profile curves for different shapes, refer to Figure 2-55. Each of these shapes can be modified as required. This brush does not work on the subdivided geometry. The **CurveMultiLathe** brush is located in the **Brush** tab of **LightBox** browser.

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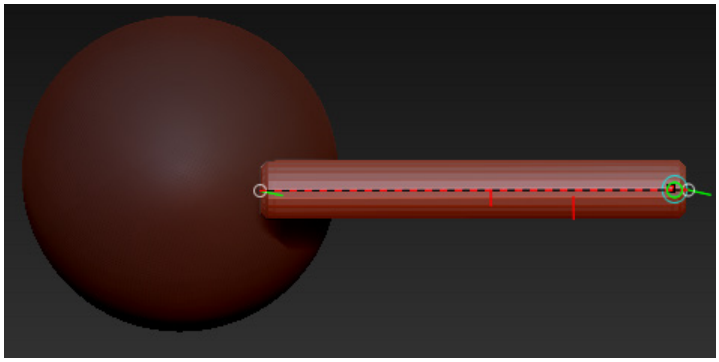


Figure 2-54 *A tube created along the straight line*

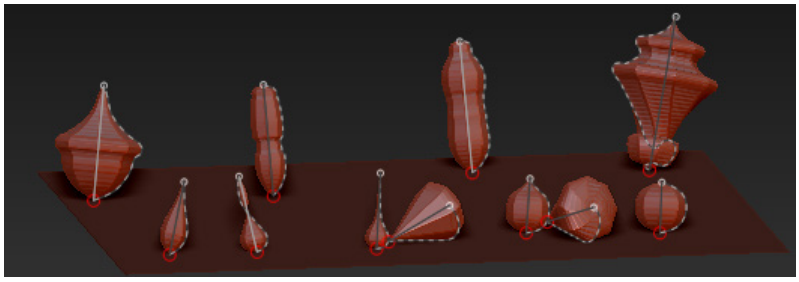


Figure 2-55 *Multiple shapes created on the surface of a plane*

CurveMultiTube Brush

The **CurveMultiTube** brush is similar to the **CurveTube** brush with the only difference that you can create multiple tubes on the surface of an object, refer to Figure 2-56. The shape of different tubes can be modified as required.

CurvePinch Brush

The **CurvePinch** brush is used to pinch the polygons of a mesh inward along the path defined by you. To sculpt using this brush, press and hold the left mouse button, and drag the cursor on the surface of the object to create the shape of your choice; a curve indicating the path will be displayed. After creating the path, hover the cursor on the surface of the path and click on it; the surface will be pinched along the path, as shown in Figure 2-57. You can modify the shape of the path either by moving the end points of the path created or by clicking on a point or by clicking on a point on the curve and then dragging the cursor.

CurveQuadFill Brush

The **CurveQuadFill** brush is used to create a planar mesh on the surface of an object. To use this brush, choose the Current Brush button from the left shelf; a flyout containing different sculpting brushes will be displayed. Choose the **CurveQuadFill** brush from this flyout. Next, press and hold the left mouse button and drag the cursor to draw an outline for the planar mesh that you want to create, refer to Figure 2-58. Next, release the left mouse button; the planar mesh will be created on the surface of the object, refer to Figure 2-59. The shape of the newly created mesh can be modified by moving different points of the path.

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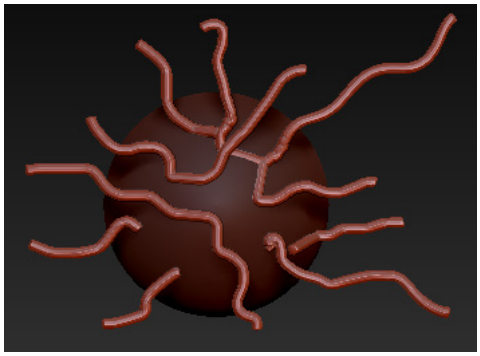


Figure 2-56 *Multiple tubes created on the surface of a sphere*

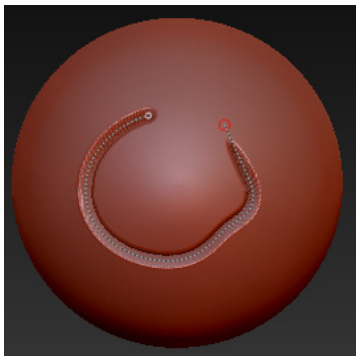


Figure 2-57 *The polygons pinched along the path*

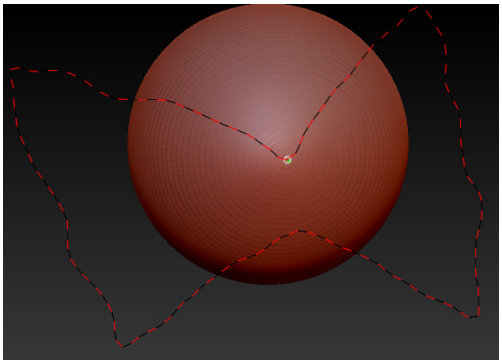


Figure 2-58 *An outline drawn on the surface of the sphere*

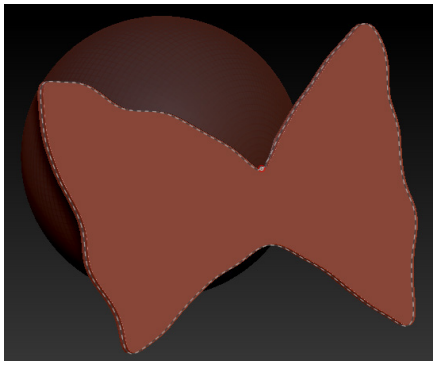


Figure 2-59 *A planar mesh created on the surface of the sphere*

CurveSnapSurface Brush

The **CurveSnapSurface** brush is used to create surfaces between multiple number of curves created on the surface of the object. To use this brush, choose the Current Brush button from the left shelf; a flyout containing different sculpting brushes will be displayed. Choose the **CurveSnapSurface** brush from this flyout. Next, press and hold the left mouse button and drag the cursor to draw a curve, refer to Figure 2-60. Draw another curve below the curve drawn previously, refer to Figure 2-61; a surface will be created between the two curves. Draw a third curve, refer to Figure 2-62; a surface will be created between the second and third curves. Continue drawing more curves to create the surface, as shown in Figure 2-63. The new surface can be moved by using the **Move** button at the top shelf.

CurveStandard Brush

The **CurveStandard** brush is used to pull out the geometry of an object in a specified path. To sculpt using this brush, press and hold the left mouse button, and drag the cursor on the surface of the object to create the desired shape, refer to Figure 2-64. After creating the path, click on it; a depth will be created along the path, as shown in Figure 2-65.

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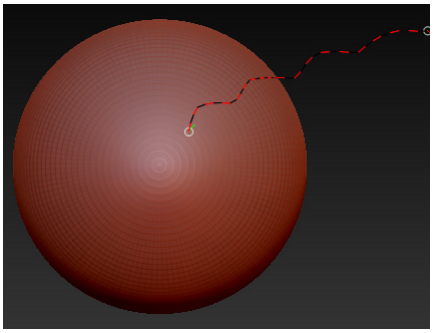


Figure 2-60 *A curve drawn on the surface of the sphere*

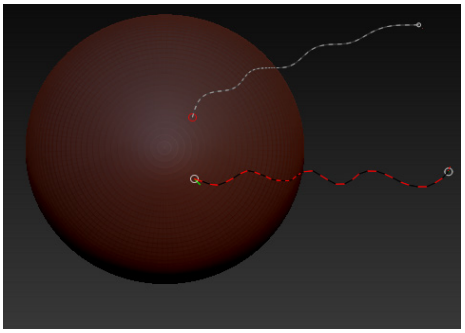


Figure 2-61 *Second curve drawn below the curve drawn previously*

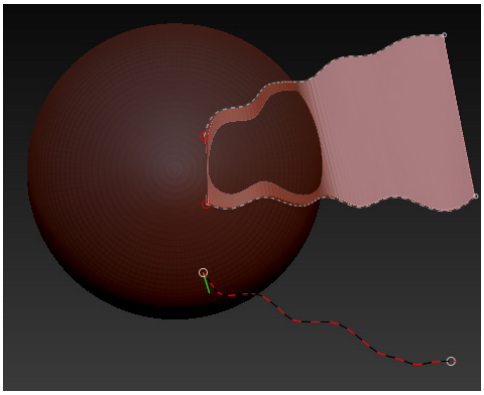


Figure 2-62 *Third curve drawn below the second curve*

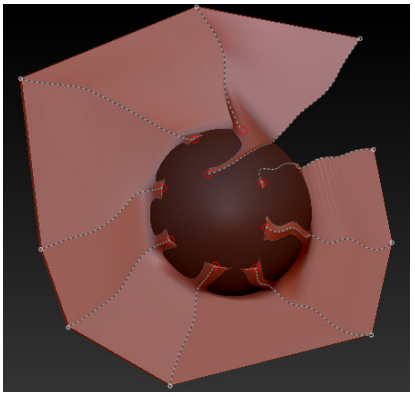


Figure 2-63 *A surface created using the* ***CurveSnapSurface*** *brush*

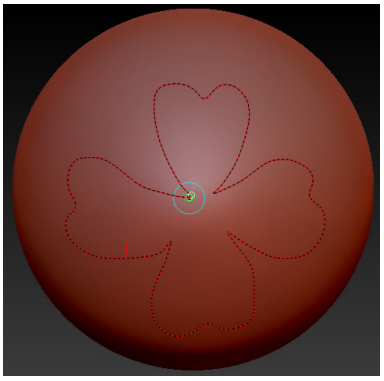


Figure 2-64 *A path created on the surface of the sphere*

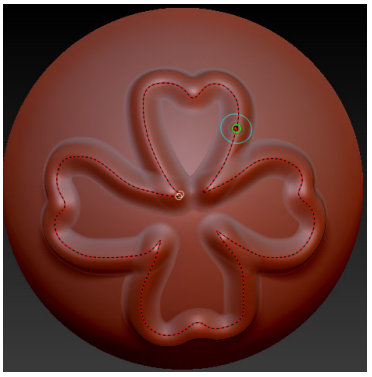


Figure 2-65 *The depth created along the path*

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CurveStrapSnap Brush

The **CurveStrapSnap** brush is used to create a ribbon like curved surface on an object. To use this brush, choose the Current Brush button from the left shelf; a flyout containing different sculpting brushes will be displayed. Choose the **CurveStrapSnap** brush from this flyout. Next, press and hold the left mouse button and drag the cursor to draw a curve, refer to Figure 2-66. Release the left mouse button; a surface resembling a ribbon will be created along the curve, refer to Figure 2-67.

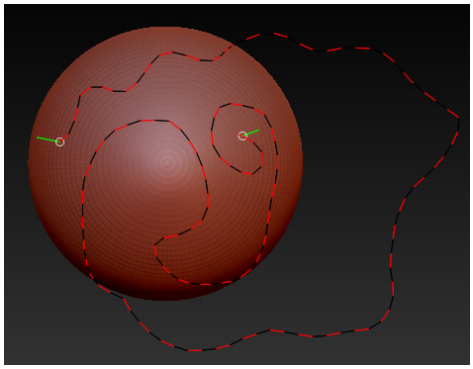


Figure 2-66 *A curve created on the surface of the sphere*

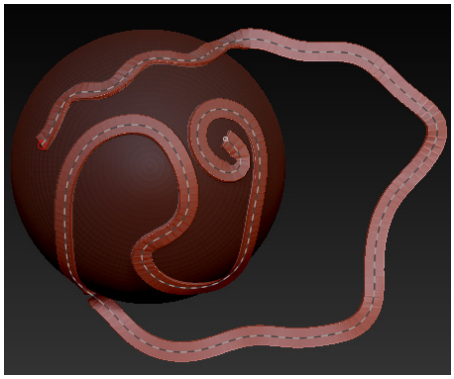


Figure 2-67 *A surface resembling a ribbon created along the curve*

CurveSurface Brush

The **CurveSurface** brush is used to create a new mesh on the surface of an object by drawing curves for the new mesh. This brush is ideal for creating a flowing cloth on the surface of an object or wings on a model. The thickness of the new mesh depends on the value of the **Draw Size** slider located in the top shelf. If the value of this slider is high, the mesh will be thicker. To use this brush on a cube converted into a polymesh, choose the Current Brush button from the left shelf; a flyout containing different sculpting brushes will be displayed. Choose the **CurveSurface** brush from this flyout. Next, press and hold the left mouse button and drag the cursor to draw a curve, refer to Figure 2-68. Draw another curve on the right side of the curve drawn previously, refer to Figure 2-69; the two curves will be snapped, refer to Figure 2-70. Similarly, draw more curves on the surface of the cube; the new mesh will be created on the surface of the cube, refer to Figure 2-71.

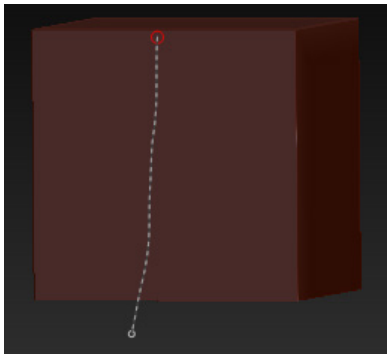


Figure 2-68 *A curve drawn on the surface of the cube*

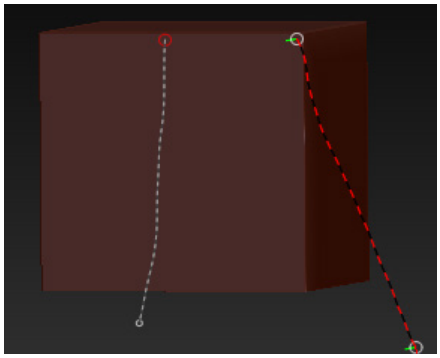


Figure 2-69 *Second curve drawn on the right side of the curve drawn previously*

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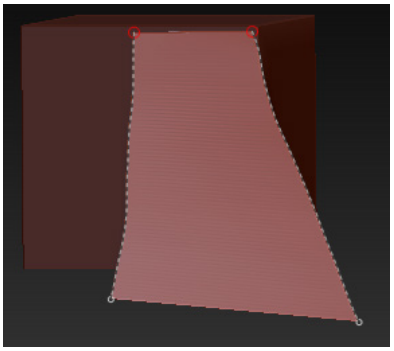


Figure 2-70 *The two curves snapped*

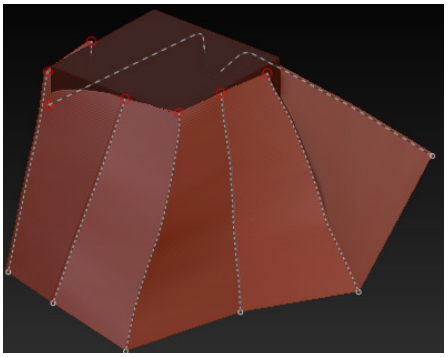


Figure 2-71 *A new mesh created on the surface of the cube*

CurveTriFill Brush

The **CurveTriFill** brush is used to create a planar surface by drawing an outline on the surface, refer to Figure 2-72.

CurveTube Brush

The **CurveTube** brush is used to create a curved tube on the surface of an object. The shape of the tube can be modified as required, refer to Figure 2-73.

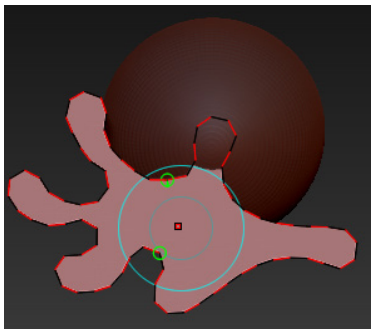


Figure 2-72 *A planar surface created using the* ***CurveTriFill*** *brush*

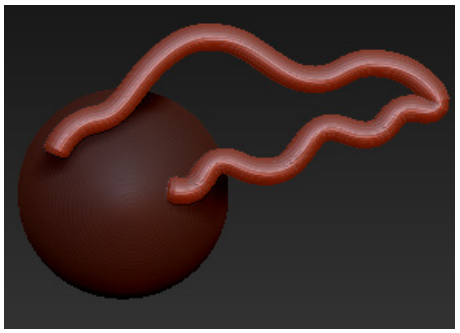


Figure 2-73 *A curved tube created using the* ***CurveTube*** *brush*

CurveTubeSnap Brush

The **CurveTubeSnap** brush is similar to the **CurveStrapSnap** brush with the only difference that instead of creating a ribbon like surface, it creates tubes.

Dam_Standard Brush



The **Dam_Standard** brush is used to create very subtle details like wrinkles, clothing seams, machined bevels, and so on. On choosing this brush, the **Zsub** button gets automatically chosen. To use this brush, press and hold the left mouse button, and drag the cursor on the surface of the object; a seam will be created on its surface, refer to Figure 2-74.

Deco1 Brush



The **Deco1** brush is used with different alphas to create detailed decorative designs on an object, refer to Figure 2-75. When this brush is chosen, an alpha gets automatically

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assigned to it. To sculpt using this brush on a smoothened plane, choose the Current Brush button from the left shelf; a flyout containing different sculpting brushes will be displayed. Choose the **Deco1** brush from this flyout. Adjust the value of the **Draw Size** slider in the top shelf as required. Next, press and hold the left mouse button and drag the cursor slightly at different places on the surface of the plane; a pattern will be created on the surface of the plane, refer to Figure 2-75.

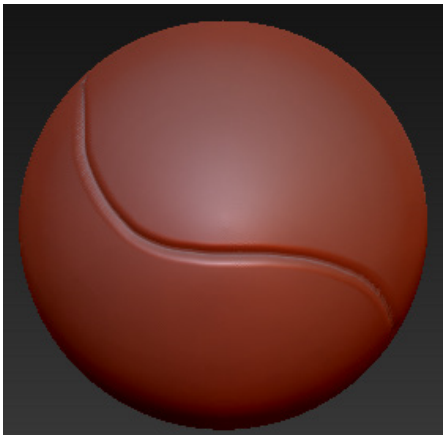


Figure 2-74 *A seam created in the sphere using the* ***Dam_Standard*** *brush*

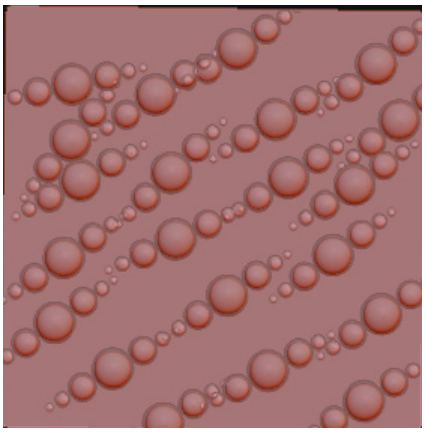


Figure 2-75 *A pattern created on the surface of a plane using the* ***Deco1*** *brush*

Displace Brush



The **Displace** brush is used to pull or push the polygons in a direction perpendicular to the surface of an object. To sculpt using this brush, choose the Current Brush button from the left shelf; a flyout containing different sculpting brushes will be displayed. Choose the **Displace** brush from this flyout. Adjust the value of the **Draw Size** slider as required, and set the value of **Z Intensity** slider to **100**. Next, press and hold the left mouse button, and drag the cursor slightly at different places on the surface of the sphere; the polygons will be pulled out perpendicularly, refer to Figure 2-76. To push the polygons in, you need to choose the **Zsub** button from the top shelf and then drag the cursor at different places, refer to Figure 2-77.

DisplaceCurve Brush



The **DisplaceCurve** brush is used to pull or push the polygons in a direction specified by creating a path curve. To sculpt using this brush, adjust the value of the **Draw Size** slider as required, and set the value of the **Z Intensity** slider to **60**. Next, press and hold the left mouse button and drag the cursor on the surface of the object to create the path curve, refer to Figure 2-78. After creating the path curve, hover the cursor on the surface of the path and click on it; the polygons will be pulled out along the path curve, as shown in Figure 2-79.

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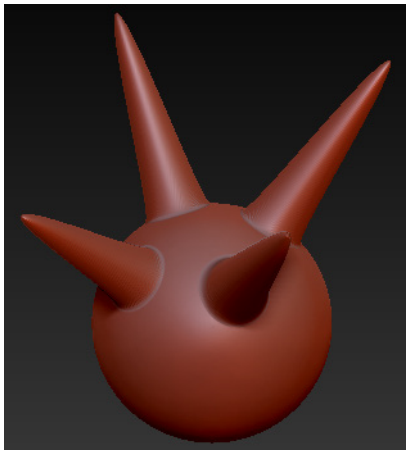


Figure 2-76 *The polygons pulled out using the* ***Displace*** *brush*

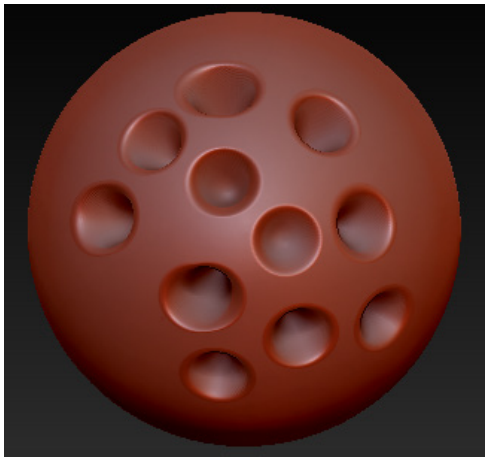


Figure 2-77 *The polygons pushed in using the* ***Displace*** *brush*

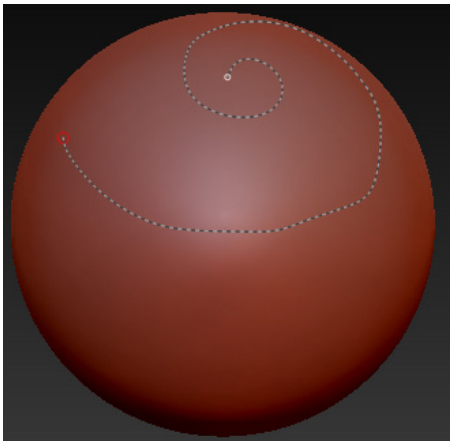


Figure 2-78 *The path curve created on the surface of the sphere*

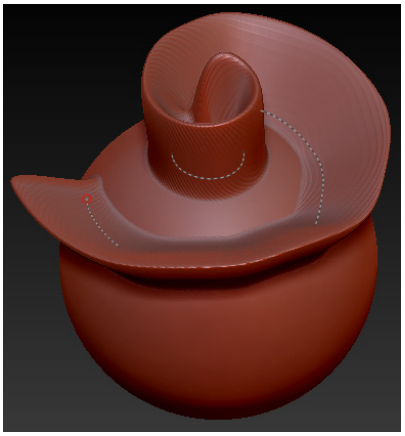


Figure 2-79 *The polygons pulled out along the path curve*

DecoCurve Dots Brush



This brush is used to project the selected alpha along the curve path. This brush has the arrow alpha selected by default. While dragging the curve start and end points, the alpha will leave a trail of sculpted details along its path. You can continue dragging the curve along a new path for further additions or subtractions.

DecoCurveDragDot Brush



This brush is used to project the alpha along a curve line path. By default, the arrow alpha is selected in this brush also. It draws a curve line on the surface of the model. If you click and drag the ends of the curve line, the projection of a single instance of the alpha will begin along the curve line. It also moves along the mesh surface.

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Elastic Brush



The **Elastic** brush is used to displace the polygons of the surface without changing the original shape of an object, refer to Figure 2-80. In Figure 2-80, you will notice that there is deformation in the surface but the original curves in the sphere are retained.



Figure 2-80 *The original shape of the sphere maintained*

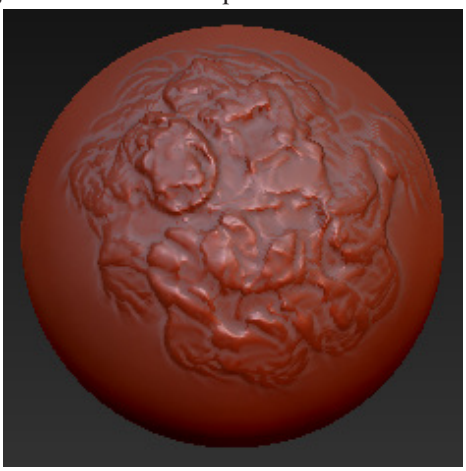


Figure 2-81 *Flakes created on the surface of a sphere*

Flakes Brush



The **Flakes** brush is used to create roughness on the surface of an object, refer to Figure 2-81. This brush can be used to create rust or flake like effect on a surface, refer to Figure 2-82.

Flatten Brush



The **Flatten** brush is used to flatten the displaced or extruded surface of an object. Figure 2-83 shows a surface on which the **Flakes** brush has been applied and the same surface using the **Flatten** brush on it.

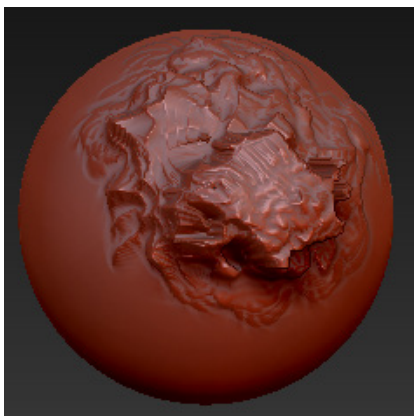


Figure 2-82 *Flakes created on the surface of a sphere using the* ***Flakes*** *brush*

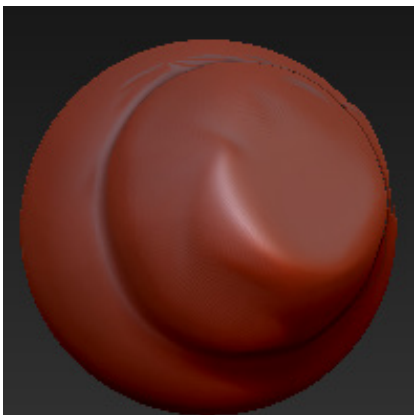


Figure 2-83 *The surface of the sphere flattened using the* ***Flatten*** *brush*

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Fold Brush



The **Fold** brush is used to fold the polygons inward along the path on which you drag the cursor on the surface of an object, refer to Figure 2-84.

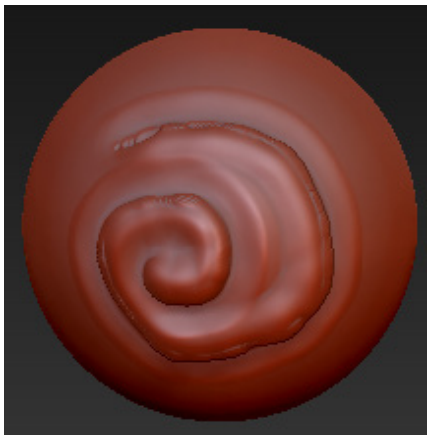


Figure 2-84 *Folds created on the surface of a sphere*

FormSoft Brush



The **FormSoft** brush is used to create smooth displacement in the surface of an object.

Fracture Brush



The **Fracture** brush is used to make the surface of an object disordered and uneven. This brush is best suited for creating rocky surfaces or crystals.

Groom Brushes

The Groom brushes are used to sculpt the **FiberMesh** in ZBrush. The **FiberMesh** is mainly used to create hair on the surface of an object. It is also used to generate different types of fibers, fur, plants, flowers, and so on. The **FiberMesh** option can be accessed from the **Tool** palette.

The Groom brushes have been designed specifically for the **FiberMesh**. These brushes are used to edit fibers in the mesh to create different patterns and hairstyles. There are sixteen types of Groom Brushes, refer to Figure 2-85. These brushes will be discussed in detail in the Chapter 4.



Figure 2-85 *The Groom brushes*

hPolish Brush



The term **hPolish** stands for hard polish. The **hPolish** brush is used to displace the surface of an object inward, so that the resulting surface has sharp and well defined edges, as shown in Figure 2-86.

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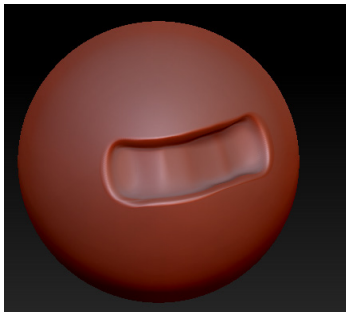


Figure 2-86 *Surface of the sphere modified by using the* ***hPolish*** *brush*

Hatch Brush



The **Hatch** brush is used to apply sculpting strokes on the object without picking up cursor. But this brush will add or subtract strokes in the forward direction. This functionality makes it easy to apply sculpting strokes in a sketch-like design, refer to Figure 2-87.

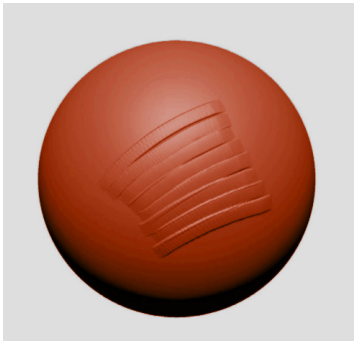


Figure 2-87 *Surface of the sphere modified by using the* ***Hatch*** *brush*

History Recall Brush



The **HistoryRecall** brush is used to capture the depth position of a model's sculpted details by using the Undo History timeline with history bar, refer to Figure 2-88. You can then project those details onto a completely different model by using the brush strokes.

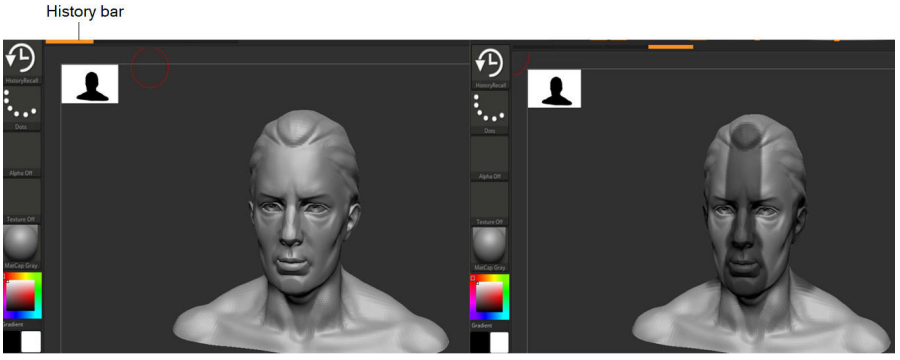


Figure 2-88 *Using the* ***HistoryRecall*** *brush*

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HatchBacktrack Brush



The **HatchBacktrack** brush is used to create a ramp effect in the sculpted details, as shown in Figure 2-89.

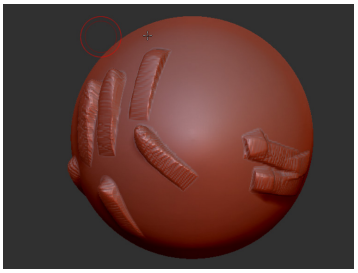


Figure 2-89 *Surface of the sphere modified by using the* ***HatchBacktrack*** *brush*

IMM Brushes

The term IMM stands for Insert Multi Mesh. The IMM brushes are used to insert different types of objects into an already existing geometry. There are eighteen types of IMM brushes, refer to Figure 2-90. Figure 2-91 shows a sphere with different types of objects inserted into it using IMM brushes.

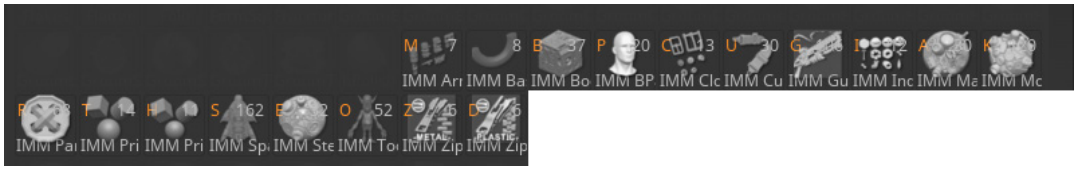


Figure 2-90 *The IMM brushes*

Before using some of the ***IMM*** *brushes, you need to freeze the subdivision levels of the object. This can be done by choosing the* ***Del Lower*** *button from the* ***Geometry*** *subpalette of the* ***Tool*** *palette.*

Inflat Brush



The **Inflat** brush is used to expand the surface of an object by a significant amount by pulling the polygons in a direction perpendicular to the surface, refer to Figure 2-92.

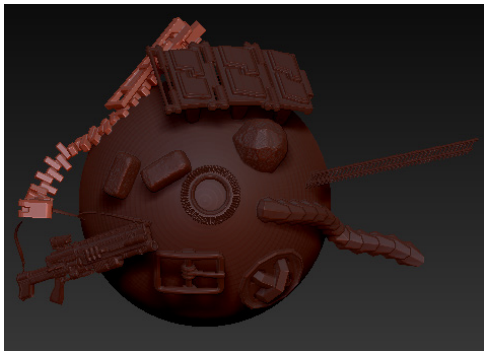


Figure 2-91 *Different objects inserted into a sphere using IMM brushes*

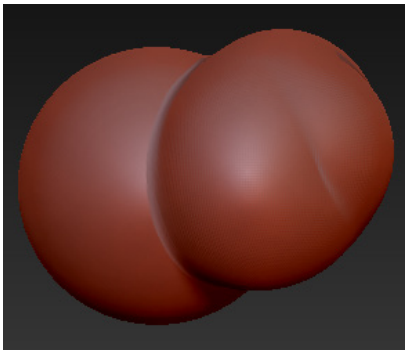


Figure 2-92 *Surface of the sphere expanded by using the* ***Inflat*** *brush*

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Insert Brushes

The Insert brushes are used to insert different geometrical shapes like cube, sphere, cylinder, and so on, into an already existing geometry. There are ten types of Insert brushes. One Insert brush is available in the flyout displayed on choosing the Current Brush button and rest of the brushes are in the **Brush** tab of the **LightBox** browser, refer to Figures 2-93a and 2-93b. Figure 2-94 shows different shapes inserted into a sphere using these brushes. These brushes work only when the geometry has not been subdivided.

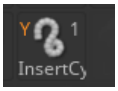


Figure 2-93 a *The Insert brushes*

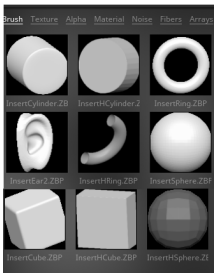


Figure 2-93 b *The Insert brushes in the* ***Brush*** *tab of the* ***LightBox*** *browser*

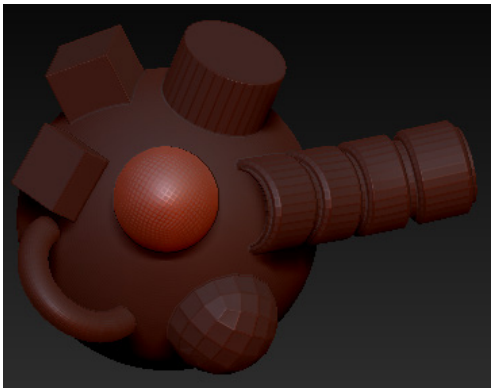


Figure 2-94 *Different shapes inserted into a sphere using the insert brushes*

Knife Brushes

In ZBrush 2022, four knife brushes are added namely: **KnifeCircle**, **KnifeCurve**, **KnifeLasso**, and **KnifeRect**. All these brushes are used to accurately create a cut along the mesh with a specific stroke. As the name of these brushes suggest, the **KnifeCircle** brush uses circular stroke, the **KnifeCurve** brush uses curve stroke, **KnifeLasso** brush uses lasso stroke, and the **KnifeRect** brush uses rectangular stroke.

You need to press CTRL+ SHIFT keys after selecting a specific knife brush and then apply the strokes. Also, in case of the **KnifeCurve** brush, you need to press ALT key as many times as you want to change the curvature of the curve drawn on the mesh.

Figures 2-95 through 2-98 show the cuts created on the sphere using these brushes. Note that the mesh created by using these brushes is a quad mesh so that it can be sculpted easily. Also, you

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can use the symmetry options in the **Transform** Palette to create symmetrical shapes using these brushes. It is important to note that knife brushes cannot cut holes through the center of mesh.

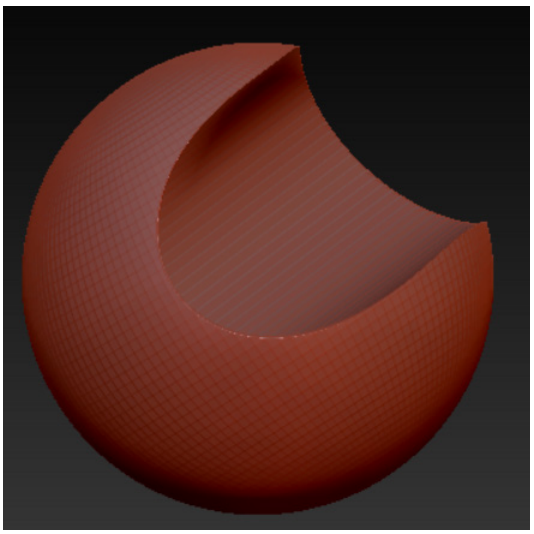


Figure 2-95 *Cut created using the* ***KnifeCircle*** *brush*

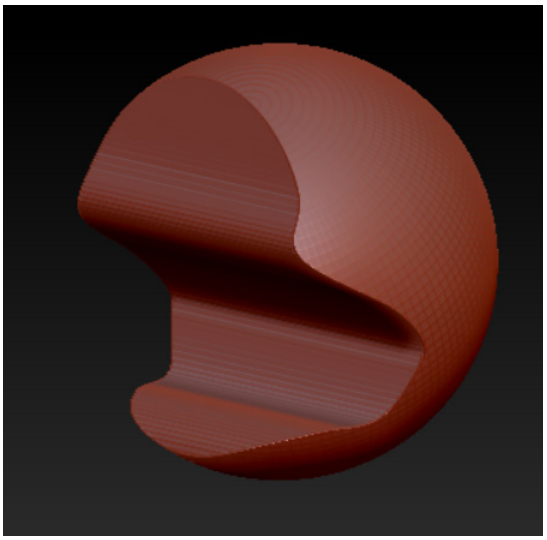


Figure 2-96 *Cut created using the* ***KnifeCurve*** *brush*

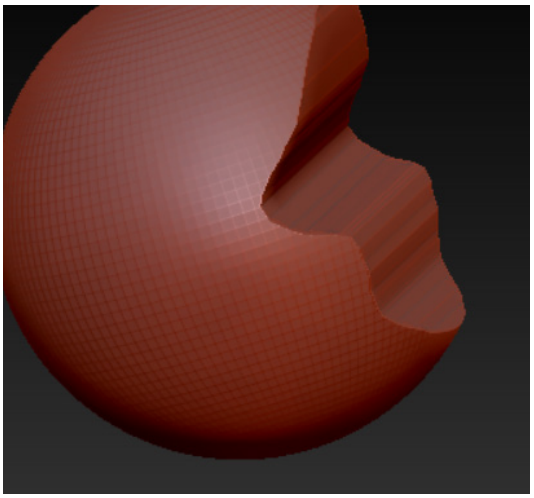


Figure 2-97 *Cut created using the* ***KnifeLasso*** *brush*

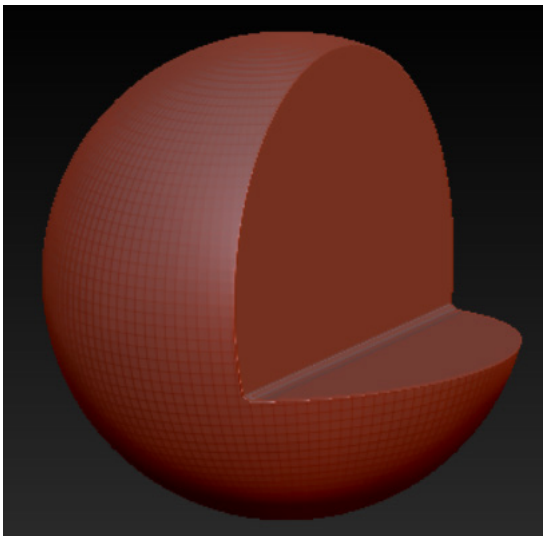


Figure 2-98 *Cut created using the* ***KnifeRect*** *brush*

Layer Brush



The **Layer** brush raises or lowers the surface of an object by a fixed amount depending on the value of **Z Intensity**. Using this brush, the depth of displacement remains constant throughout the surface of an object, without any overlapping strokes, refer to Figure 2-99.

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Figure 2-99 *Constant displacement created using the* ***Layer*** *brush*

LayeredPattern Brush



The **LayeredPattern** brush is used to create different patterns on the surface of an object, refer to Figure 2-100. On choosing this brush, an alpha is automatically assigned to it. The depth of the pattern created on the surface remains constant throughout the surface.

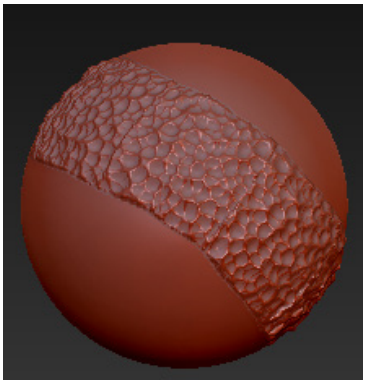


Figure 2-100 *A pattern created using the* ***LayeredPattern*** *brush*

Magnify Brush



The **Magnify** brush produces significant displacement on the surface of an object. The amount of magnification is determined by the value of the **Z Intensity** slider.

Mask Brushes

The Mask brushes are used to isolate a certain region of an object. If a particular area is masked on a surface, you cannot make any changes in that area. The unmasked area can be modified without affecting the masked area. There are eight types of Mask brushes, namely **MaskCircle**, **MaskCurve**, **MaskCurvePen**, **MaskLasso**, **MaskPen**, **MaskPerfectCirc**, **MaskSquare**, and **MaskRect**, refer to Figure 2-101.

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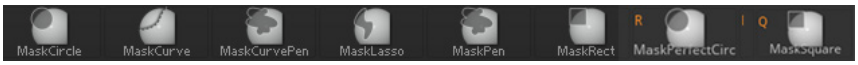


Figure 2-101 *The mask brushes*

The **MaskCircle** brush uses a circular stroke to create a mask. The circular area that comes under the mask cannot be sculpted or modified. To use this brush, choose the Current Brush button from the left shelf; a flyout containing different sculpting brushes will be displayed. Choose the **MaskCircle** brush from the flyout; a message box will be displayed prompting you to press the CTRL key to use this brush, refer to Figure 2-102.

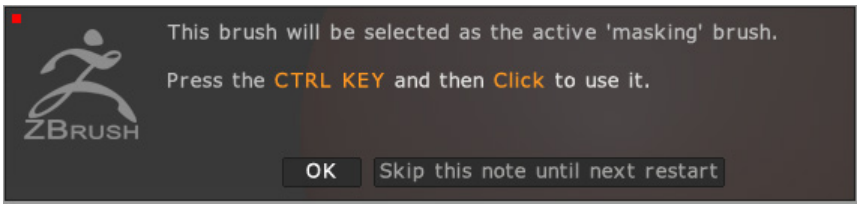


Figure 2-102 *The message box displayed on choosing the* ***MaskCircle*** *brush*

Choose the **OK** button to close this message box. Next, press and hold the CTRL key and drag the cursor on the surface of the sphere; a marquee selection will be displayed, refer to Figure 2-103. Next, release the left mouse button; a grey colored circular mask will be created on the surface of the sphere, as shown in Figure 2-104. You can also invert the mask by pressing CTRL+I.

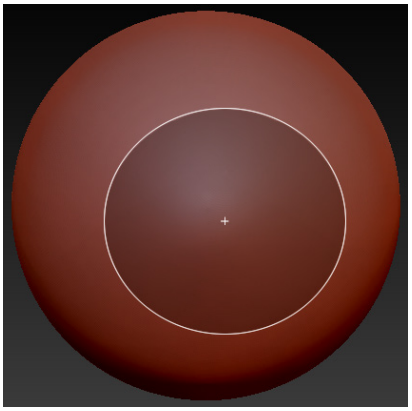


Figure 2-103 *A circular marquee selection displayed*

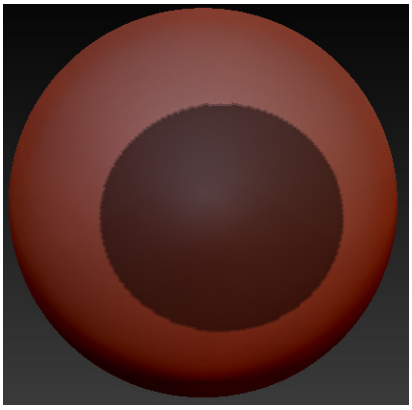


Figure 2-104 *A circular mask created on the surface of the sphere*

The **MaskCurve** brush uses curves or straight lines to create a mask on the surface of an object. To use this brush, choose the Current Brush button from the left shelf; a flyout containing different sculpting brushes will be displayed. Choose the **MaskCurve** brush from this flyout; a message box will be displayed prompting you to press the CTRL key to use this brush. Choose the **OK** button in this message box.

Next, press and hold the CTRL key and then drag the cursor on the surface of the sphere starting from top to bottom; a straight line with grey highlighted area will be displayed on the surface of the sphere, refer to Figure 2-105. Next, release the left mouse button; a mask will be created on the surface of the sphere, as shown in Figure 2-106.

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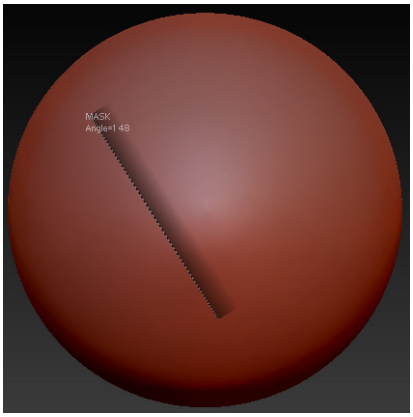


Figure 2-105 *A straight line displayed on the surface of the sphere*

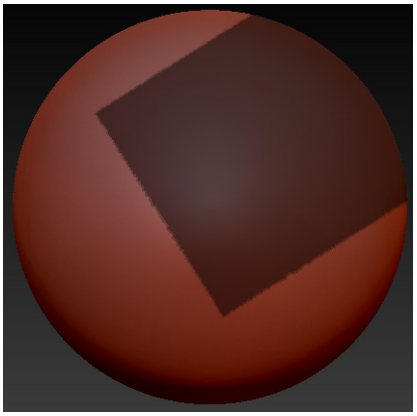


Figure 2-106 *A mask created on the surface of the sphere*

The **MaskCurvePen** brush is used to create a mask along the curve path. To sculpt using this brush, press and hold the CTRL key and drag the cursor on the surface of the sphere to create a curve path of your choice, refer to Figure 2-107. After creating the path, make sure the CTRL key is pressed, and then click on the path; a mask will be created along the path, as shown in Figure 2-108.

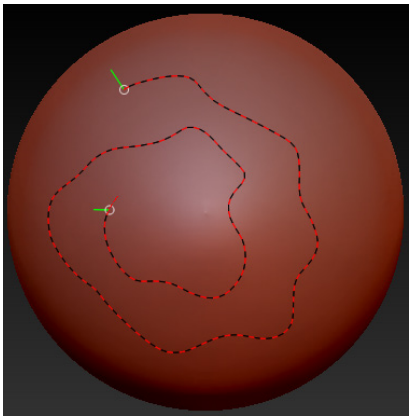


Figure 2-107 *A path curve created on the surface of the sphere*

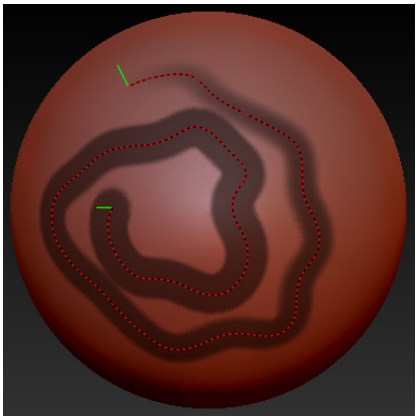


Figure 2-108 *A mask created along the path curve*

The **MaskLasso** brush is used to create freeform masks on the surface of an object using a mask overlay, refer to Figure 2-109. The **MaskPen** brush is used to draw a mask of any desired shape using a free hand, refer to Figure 2-110. It gives you the feel of working with a pen. The **MaskRect** brush is similar to **MaskCircle** brush with the only difference that it uses a rectangular stroke as a mask.

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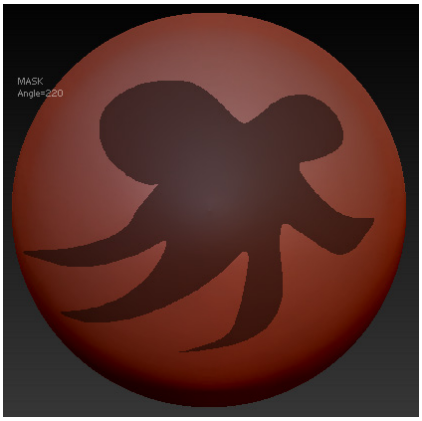


Figure 2-109 *A freeform mask created using the mask overlay*



Figure 2-110 *A mask drawn with freehand using the* ***MaskPen*** *brush*

You can remove a mask from a particular area of the mask by pressing CTRL+ALT and then by dragging the cursor on that particular area, refer to Figures 2-111 and 2-112. To remove the entire mask from a surface, press and hold the CTRL key and then drag the cursor on the canvas area. You can also use different alpha images to create masks on the surface of an object.



Figure 2-111 *A mask created using the* ***MaskPen*** *brush*

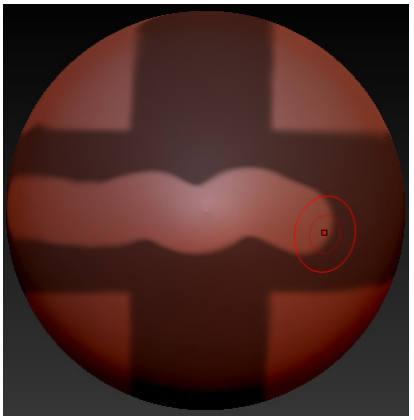


Figure 2-112 *An area of the mask removed*

MatchMaker Brush



The **MatchMaker** brush is used to fit one mesh into the contours of another mesh. For example, if you have modelled a human face and a mask separately, then you can fit the mask into the contours of a face by pressing and holding the left mouse button and by dragging the cursor on the surface of the mask.

MeshInsert Dot Brush



The **MeshInsert Dot** brush is used to insert one 3D object into another. To use this brush, choose the Current Brush button from the left shelf; a flyout containing different sculpting brushes will be displayed. Choose the **MeshInsert Dot** brush from the flyout. Next, choose the **Brush** palette to expand it. In this palette, choose the **Modifiers** subpalette, refer to

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Figure 2-113. Next, choose the **MeshInsert Preview** button; a flyout will be displayed, refer to Figure 2-114. From the **3D Meshes** area of this flyout, choose the required primitive. Next, press and hold the left mouse button and drag the cursor on the surface of the sphere; the chosen primitive will be created on the surface of the sphere, refer to Figure 2-115. You can insert more primitives into the sphere by choosing the **MeshInsert Preview** button again, refer to Figure 2-116.

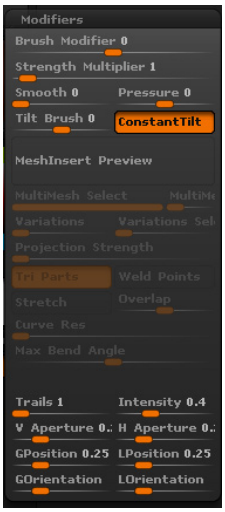


Figure 2-113 *The* ***Modifiers*** *subpalette in the* ***Brush*** *palette*



Figure 2-114 *The flyout displayed on choosing the* ***MeshInsert Preview*** *button*

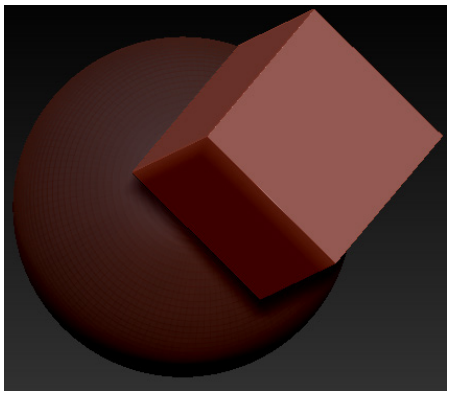


Figure 2-115 *A cube created on the surface of the sphere*

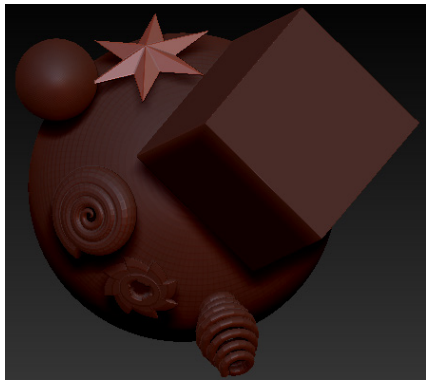


Figure 2-116 *Different types of primitives inserted on the surface of the sphere*



Note

Before using the ***MeshInsert Dot*** *brush, make sure that the value of the* ***SDiv*** *slider is 1. This can be done by choosing the* ***Del Lower*** *button from the* ***Geometry*** *subpalette of the* ***Tool*** *palette.*

Morph Brush



The **Morph** brush is used to apply the saved modification to a 3D object. This modified state of the model is known as morph. To use this brush, choose the Current Brush button

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from the left shelf; a flyout containing different sculpting brushes will be displayed. Choose the **ClayBuildup** brush from this flyout. Press and hold the left mouse button and drag the cursor on the surface of the sphere to create a pattern of your choice, refer to Figure 2-117. Next, in the **Tool** palette, expand the **Morph Target** subpalette, refer to Figure 2-118. Now, choose the **StoreMT** button in this subpalette; the current state of the sphere will be stored.

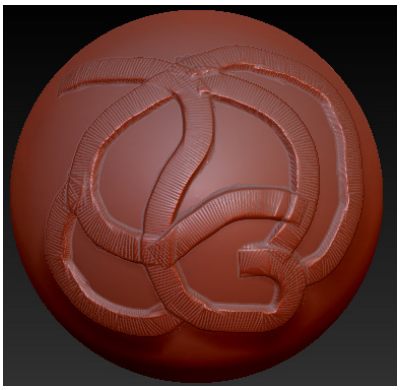


Figure 2-117 *A pattern created using the* ***ClayBuildup*** *brush*



Figure 2-118 *The* ***Morph Target*** *subpalette in the* ***Tool*** *palette*

Choose the Current Brush button from the left shelf; a flyout containing different sculpting brushes will be displayed. Choose the **ClayTubes** brush from this flyout, and then press and hold the left mouse button and drag the cursor on the surface of the sphere to create another pattern on the existing pattern, refer to Figure 2-119. Next, choose the **Morph** brush and then press and hold the left mouse button, and drag the cursor on the surface of the sphere, refer to Figure 2-120; the pattern created earlier will be displayed again and the new pattern will disappear.

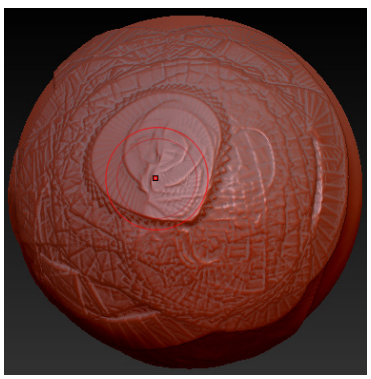


Figure 2-119 *A pattern created on the existing pattern*

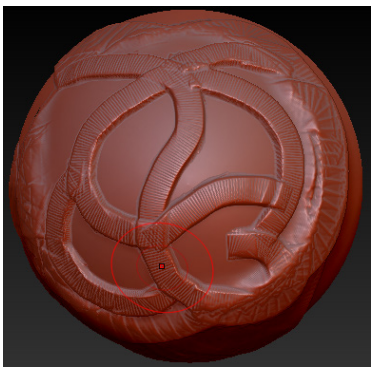


Figure 2-120 *Cursor dragged on the surface of the sphere*

Move Brushes

There are five types of Move brushes, namely **Move Elastic**, **Move Topological**, **Move**, **MoveCurve**, and **MoveInfinteDepth**, as shown in Figure 2-121.

The **Move Elastic** brush is used to deform a 3D object by moving its polygons but less amount of stretching is made in the polygons. The **Move Topological** brush is used to modify areas where

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the cursor is dragged, without affecting the surrounding geometry. This brush can be used to modify facial expressions. For instance with the help of this brush, you can move the eyelid of a character without affecting the other areas of the eye. The **Move** brush is the most commonly used brush in ZBrush. It is used to form the basic shape of your model, refer to Figure 2-122.



Figure 2-121 *The Move brushes*

The **MoveCurve** brush is used to move the polygons of an object along the path curve, refer to Figure 2-123. The working of this brush is similar to the **DisplaceCurve** brush.

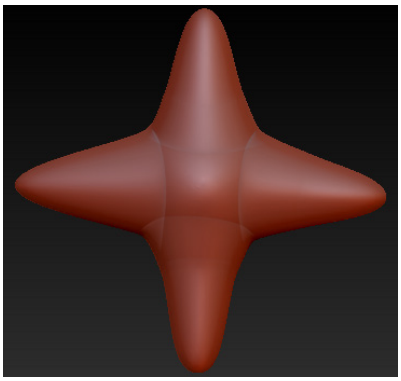


Figure 2-122 *Shape of the sphere modified using the* ***Move*** *brush*

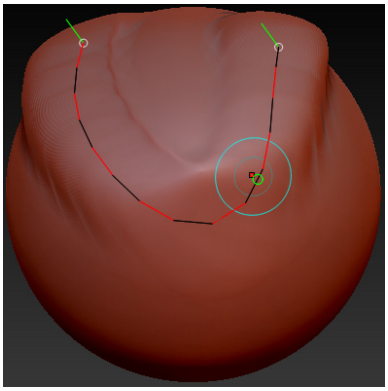


Figure 2-123 *The polygons moved along the path curve*

The **MoveInfiniteDepth** brush moves the surface of a model relative to the camera based on the orientation of the model. This brush evaluates the camera view irrespective of the local coordinates of the model. This in turn determines the depth direction of the brush stroke and you need not have to use masking or the **Gizmo 3D** tool.

Noise Brush



The **Noise** brush adds noise to a surface, thus making it rough. In Figure 2-124, the noise pattern has been created by dragging the cursor on the surface of the sphere continuously. This brush can be used to sculpt rocky surfaces. At very low value of the **Z Intensity** slider, this brush can also be used to add pores to the nose of a human face.

Nudge Brush



The **Nudge** brush moves the polygons in the direction of brush stroke. You can change the geometry of an object using this brush.

Pen Brushes

The Pen brushes are used in the **Quick Sketch** mode or painting on the polygons. There are two types of Pen brushes, namely **Pen A** and **Pen Shadow**, refer to Figure 2-125. Each of the pen

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brush creates different types of strokes. The **Pen A** brush creates a simple paint stroke, whereas the **Pen Shadow** brush creates an embossed stroke.

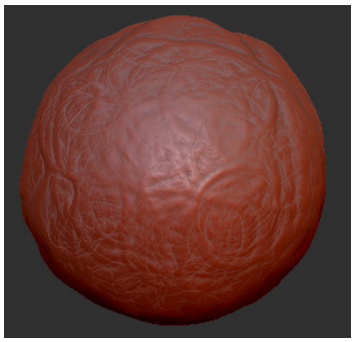


Figure 2-124 *Fractal noise added using the* ***Noise*** *brush*

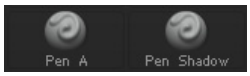


Figure 2-125 *The pen brushes*

Pinch Brush



The **Pinch** brush is used to pinch the vertices of an object. This brush is useful in adding subtle details like dimples and cuts to a human face.

Planar Brush



The **Planar** brush is used to flatten the surface of an object, refer to Figure 2-126. This brush converts an elevated surface into a planar surface.

Polish Brush



The **Polish** brush is used to flatten and smoothen the surface of an object to make it look like a metallic object.

Rake Brush



The **Rake** brush is used to produce scratch like effect on the surface of an object, refer to Figure 2-127.

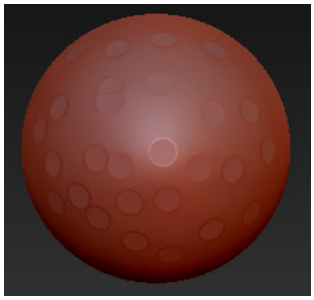


Figure 2-126 *The surface of the sphere flattened*



Figure 2-127 *Scratches created on the surface of a sphere*

Scribe Brushes

There are two types of Scribe brushes namely the **ScribeChisel** and **ScribeStandard**, as shown in Figure 2-128. These brushes are used to carve a shape into the surface of a mesh with falloff

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controls. Figure 2-129 shows the sphere on which strokes are created using the **ScribeChisel** and **ScribeStandard** brushes. You can also adjust the intensity of the stroke along its length. To do so, click on the **Stroke** palette and set **1** in the **SubSteps** spinner of the **Curve** area. Next, apply the strokes on the sphere. Notice the difference in the strokes by changing the value in the **SubSteps** spinner, refer to Figure 2-130. The shape of the stroke applied can also be changed by dragging red circles that are available at both the ends of the curve drawn, refer to Figure 2-131. You can also click in between the curve and drag to change the shape of the curve, refer to Figure 2-132.



Figure 2-128 *The Scribe brushes*

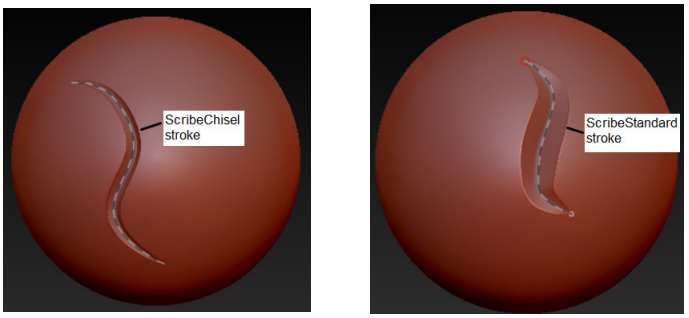


Figure 2-129 *Strokes created using the* ***ScribeChisel*** *and* ***ScribeStandard*** *brushes*

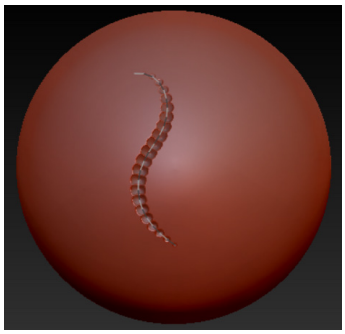


Figure 2-130 *Strokes changed by changing the value in the* ***SubSteps*** *spinner*

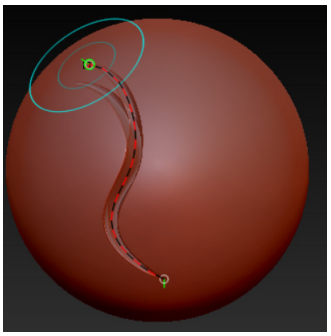


Figure 2-131 *Dragging the red circle*

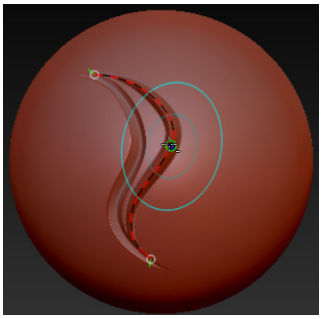


Figure 2-132 *Clicking in between the curve and dragging*

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Select Brushes

There are two types of Select brushes namely the **SelectLasso** and **SelectRect**, as shown in Figure 2-133. These brushes are used to select and modify a particular area of an object. The **SelectLasso** brush enables you to draw the desired shape and the **SelectRect** brush uses rectangular stroke to select an area. To use this brush, choose the Current Brush button from the left shelf; a flyout containing different sculpting brushes will be displayed. Choose the **SelectLasso** brush from this flyout; a message box will be displayed prompting you to press CTRL+SHIFT to activate this brush, refer to Figure 2-134.

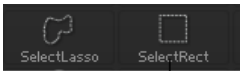


Figure 2-133 *The select brushes*

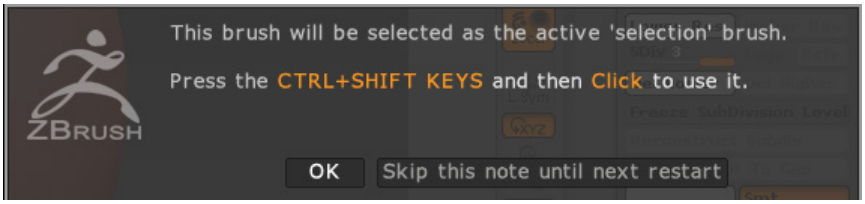


Figure 2-134 *The message box displayed on choosing the* ***SelectLasso*** *brush*

Press CTRL+SHIFT, and then press and hold the left mouse button. Next, drag the cursor on the surface of the sphere to create a selection area on the sphere; a green colored selection mask will be displayed, refer to Figure 2-135. Release the left mouse button; the selected area of the sphere will be displayed on the canvas, refer to Figure 2-136.

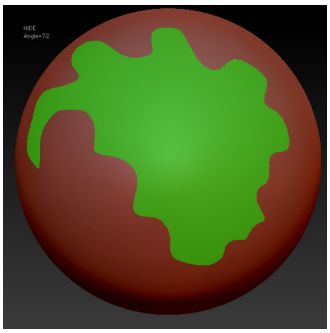


Figure 2-135 *Green selection mask displayed on the surface*



Figure 2-136 *The selected area displayed in the canvas*

Next, sculpt the selected area using different brushes, refer to Figure 2-137. In this figure, the **Standard** brush and the **ClayBuildup** brush have been used to sculpt the selected area. After sculpting the selected area, press and hold the CTRL+SHIFT key and the left mouse button, and then click on the canvas area; the complete model of the sphere along with the modified selection area will be displayed in the canvas area, refer to Figure 2-138.

The working of **SelectRect** brush is similar to **SelectLasso** brush with the only difference that a rectangular selection mask is created using this brush, refer to Figures 2-139 and 2-140.

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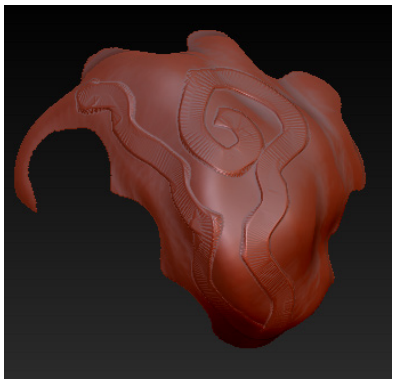


Figure 2-137 *The selected area sculpted using different brushes*



Figure 2-138 *The complete sphere displayed in the canvas*

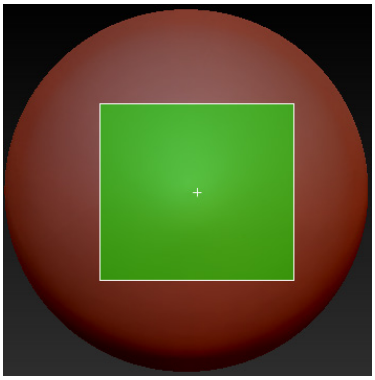


Figure 2-139 *The green colored rectangular selection displayed*

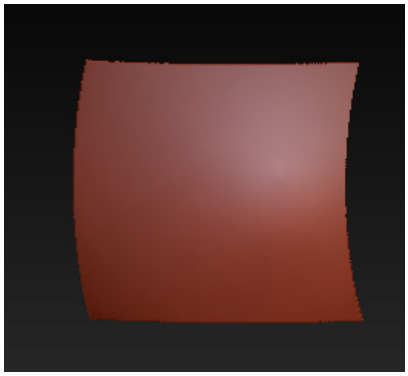


Figure 2-140 *The selected area of the sphere displayed in the canvas*

Slash3 Brush



The **Slash3** brush is used to produce an effect resembling a pattern produced if a soft surface is cut by a knife, refer to Figures 2-141 and 2-142.

Slice Brushes

There are three types of Slice brushes, namely the **SliceCirc**, **SliceCurve**, and **SliceRect**, as shown in Figure 2-143. Before using these brushes, you need to make sure that the geometry is not subdivided.

The **SliceCirc** brush is used to divide an object into a number of parts using a circular selection area, such that each part can be modified individually. To understand the working of this brush, create a sphere in the canvas and convert it into polymesh. Next, choose the **PolyF** button from the right shelf to view the polygon distribution of the sphere, refer to Figure 2-144.

Choose the Current Brush button from the left shelf; a flyout containing different sculpting brushes will be displayed. Choose the **SliceCirc** brush from this flyout; a message box will be displayed prompting you to press CTRL+SHIFT to activate this brush, refer to Figure 2-145.

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Figure 2-141 *Pattern produced using the* ***Slash3*** *brush*



Figure 2-142 *Pattern produced using the* ***Slash3*** *brush*



Figure 2-143 *The slice brushes*

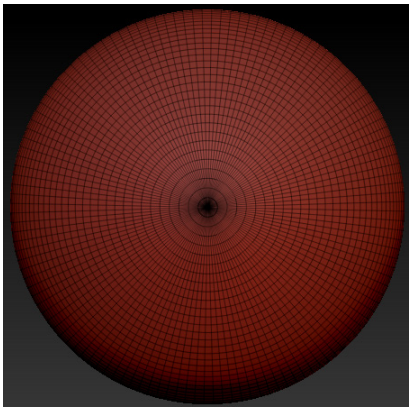


Figure 2-144 *The polygons of the sphere displayed*

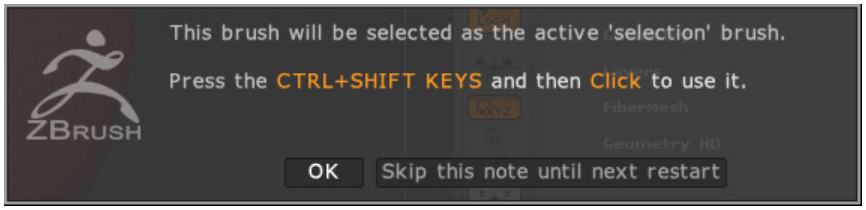


Figure 2-145 *The message box displayed on choosing the* ***SliceCirc*** *button*

Press CTRL+SHIFT and then drag the cursor on the surface of the sphere; a circular selection mask will be displayed, refer to Figure 2-146. Release the left mouse button; the color of the selected area will change and it will be split into a separate group, refer to Figure 2-147. Press the CTRL+SHIFT keys and then click on the split area; it will be displayed in the canvas and rest of the sphere will disappear, refer to Figure 2-148. Next, sculpt the selected area using the **Standard** brush, refer to Figure 2-149. After sculpting the selected area, press and hold the CTRL+SHIFT key and then click on the canvas area; the complete model of the sphere along with the modified selection area will be displayed in the canvas area, refer to Figure 2-150.

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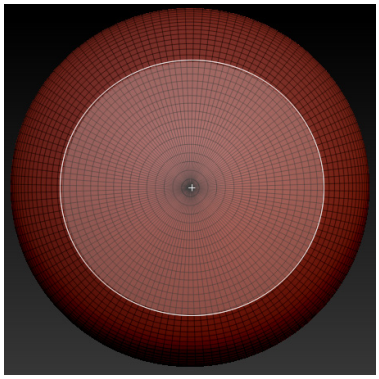


Figure 2-146 *A circular selection mask displayed on the sphere*

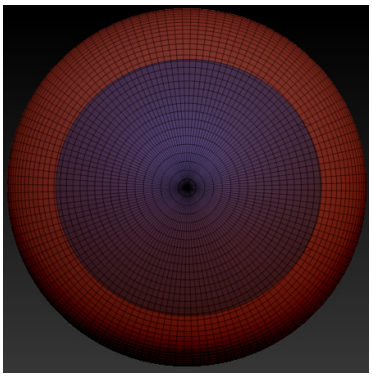


Figure 2-147 *The selected area of the mask separated from the sphere*

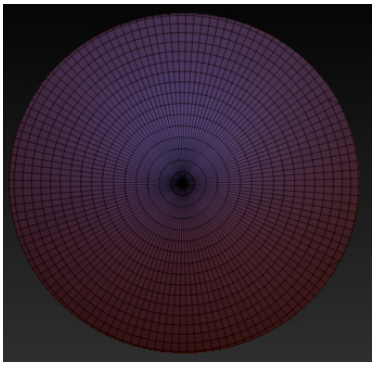


Figure 2-148 *The selected area displayed in the canvas*

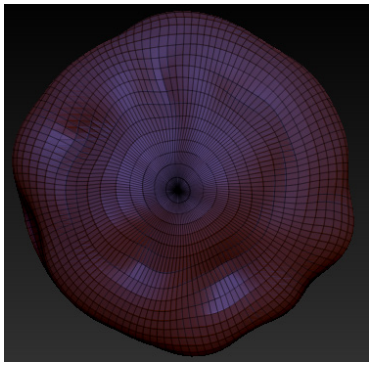


Figure 2-149 *The selected area sculpted using the* ***Standard*** *brush*

The **SliceCurve** brush uses curves or straight lines to split an object into separate groups, refer to Figure 2-151. The **SliceRect** brush works similar to the **SliceCirc** brush with the only difference that instead of creating a circular selection area, it creates a rectangular selection area, refer to Figure 2-152.

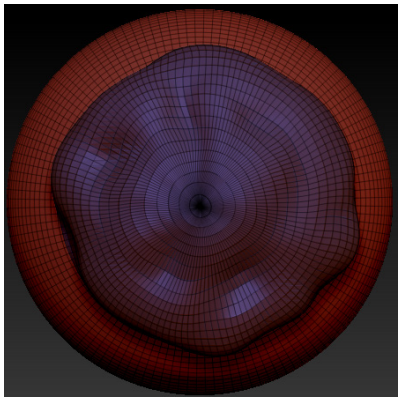


Figure 2-150 *The complete sphere displayed in the canvas*

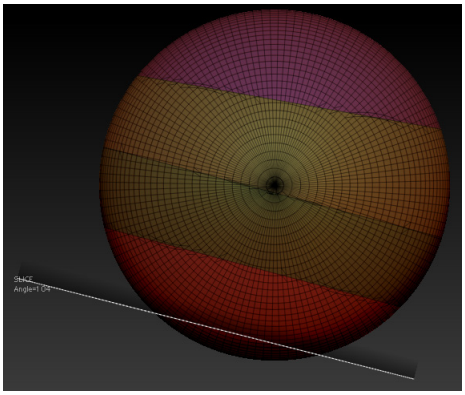


Figure 2-151 *The sphere divided into different parts using the* ***SliceCurve*** *brush*

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Slide Brush



The **Slide** brush is used to slide out the polygons of an object in the outward direction, refer to Figure 2-153.

Smooth Brushes

There are five types of Smooth brushes, namely **Smooth**, **SmoothPeaks**, **SmoothAlt**, **SmoothCloth**, and **SmoothValleys**, as shown in Figure 2-154. The **Smooth** brush is used to even out the displaced surface in order to create a smoother appearance. To invoke this brush, choose the Current Brush button from the left shelf; a flyout containing different sculpting brushes will be displayed. Choose the **Standard** brush from this flyout. Next, choose the Current Alpha button from the left shelf; a flyout containing different alpha images will be displayed. Choose the **Alpha 05** alpha image from this flyout. Next, press and hold the left mouse button and drag the cursor on the surface of the sphere to create the pattern, as shown in Figure 2-155.

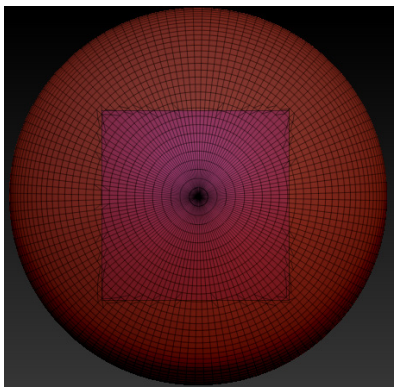


Figure 2-152 *A rectangular selection area created on the surface of sphere*

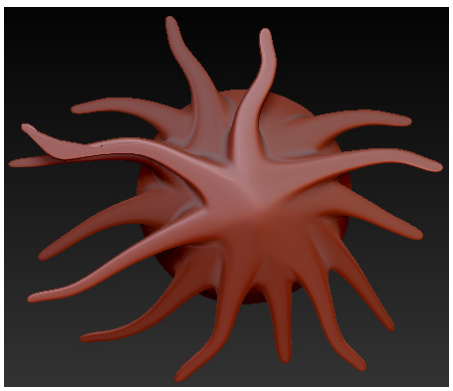


Figure 2-153 *The polygons slid outward using the* ***Slide*** *brush*

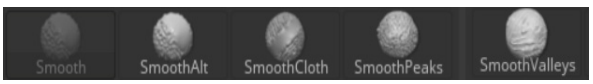


Figure 2-154 *The Smooth brushes*

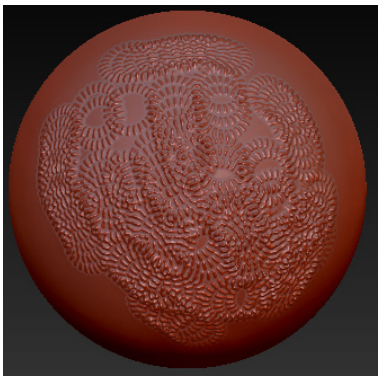


Figure 2-155 *Pattern created using the* ***Standard*** *brush*

Next, choose the **Smooth** brush; a message box prompting to press SHIFT to activate this brush will be displayed, refer to Figure 2-156. Choose the **OK** button from this message box. Press

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SHIFT and then press and hold the left mouse button. Next, drag the cursor on the surface of the sphere; the sculpted area of the sphere will become smoother, refer to Figure 2-157.

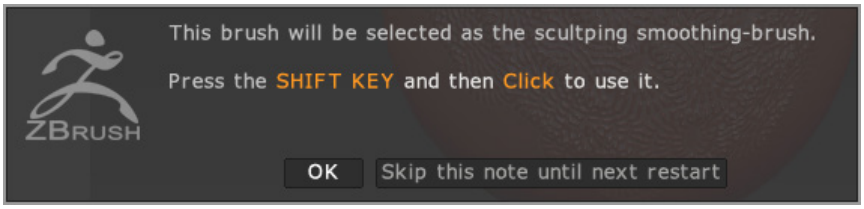


Figure 2-156 *The message box displayed on choosing the* ***Smooth*** *brush*



Figure 2-157 *The surface smoothened using the* ***Smooth*** *brush*

The **SmoothPeaks** brush is used to smoothen the surface of the peaks created on an object, refer to Figure 2-158. In Figure 2-159, the peak has been created using the **ClayBuildup** brush. The **SmoothValleys** brush is used to smoothen the surface of the cavities created on an object, refer to Figures 2-160 and 2-149. In Figure 2-161, the cavity has been created using the **ClayBuildup** brush and by choosing the **Zsub** button from the top shelf.

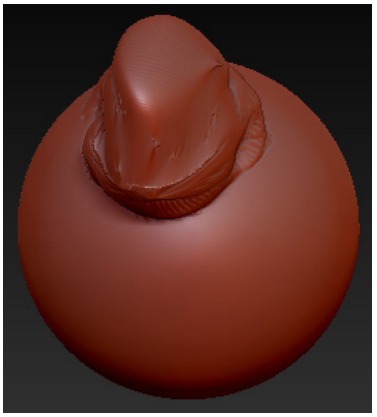


Figure 2-158 *Peak smoothened using the* ***SmoothPeaks*** *brush*

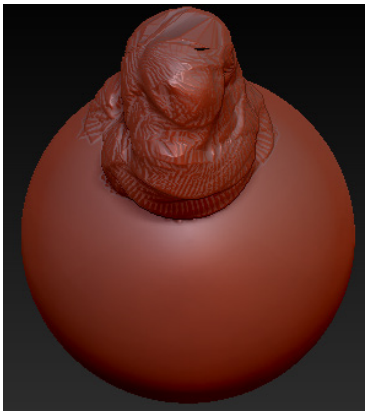


Figure 2-159 *Peak created using the* ***ClayBuildup*** *brush*

The **SmoothAlt** brush is used to smoothen a surface while retaining its volume. Figure 2-162 shows DemoTreeFrog model before using the **SmoothAlt** brush and Figure 2-163 shows the DemoTreeFrog model after using the **SmoothAlt** brush in the marked area.

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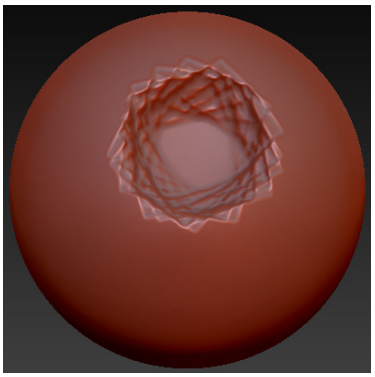


Figure 2-160 *Cavity created using the* ***ClayBuildup*** *brush*

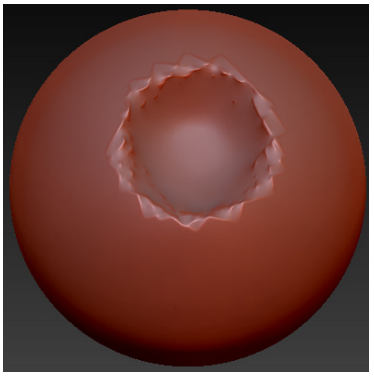


Figure 2-161 *Cavity smoothened using the* ***SmoothValleys*** *brush*

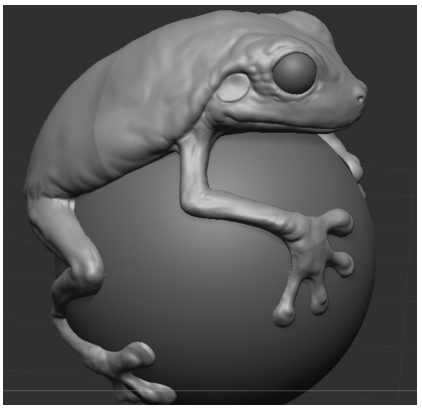


Figure 2-162 *The DemoTreeFrog model before using the* ***SmoothAlt*** *brush*

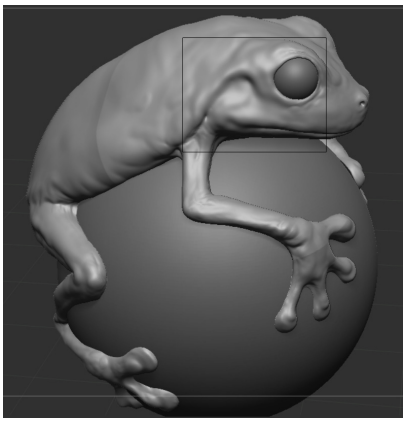


Figure 2-163 *The DemoTreeFrog model after using the* ***SmoothAlt*** *brush in the marked area*

The **SmoothCloth** brush is used to smoothen edges at the border of a surface. This brush is most suitable when you use any primitive as a cloth and you want to smoothen its border edges.

Note that you can adjust the parameters in the **Smooth Brush modifiers** area of the **Brush** Palette to modify the effect of all the brushes mentioned above.

Snake Brushes

There are eight types of Snake brushes, namely the **SnakeCactus, SnakeHook, SnakeHook2**, **SnakeSphere, SnakeCurve1, SnakeCurve2, SnakeCurve4,** and **SnakeCurve5**, as shown in Figure 2-164. Note that the snakecurve brushes have been introduced in ZBrush 2022. The Snake brushes are used to pull out the surface in order to create a different type of appearance such as cactus, horn etc. To invoke these brushes, choose the Current Brush button from the left shelf; a flyout containing different sculpting brushes will be displayed. Choose one of the snake brushes from this flyout. Next, choose the **Stroke** palette; the flyout will be displayed. Choose the **SculptPro** from the flyout. Next, press and hold the left mouse button and drag the cursor on the surface of the sphere to create different types of shapes.

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In case of Snakecurve brushes, you first need to create a curve using the brush and then pull the created curve to get the desired shape. Figure 2-165 shows the curve drawn on a sphere using the **SnakeCurve1** brush and Figure 2-166 shows the shape created on the sphere after pulling the drawn curve. Note that symmetry feature in the **Transform** palette can also be used while using Snake brushes, refer to Figure 2-166.



Figure 2-164 *The snake brushes*

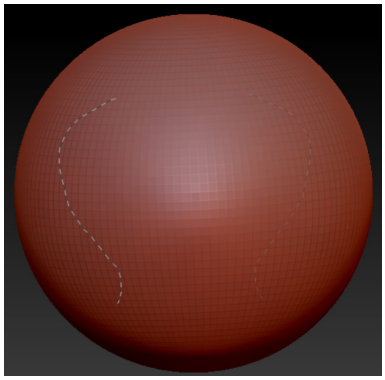


Figure 2-165 *Curve drawn using the* ***SnakeCurve1*** *brush*

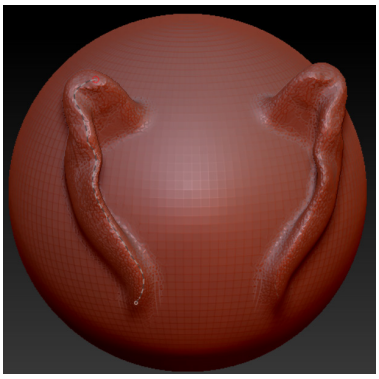


Figure 2-166 *Shape created after pulling the drawn curve*

SnakeHook Brush



The **SnakeHook** brush is used to pull out strands from a surface. These strands have narrow ends. This brush is ideal for making barks, horns, and so on, refer to Figure 2-167.

SnakeCactus Brush



The **SnakeCactus** brush is used to pull out strands from a surface, refer to Figure 2-167. These strands have replicate the look of cactus. This brush is ideal for making cactus.

SnakeSphere Brush



The **SnakeSphere** brush is used to pull out strands from a surface, refer to Figure 2-168. These strands have the look of fingers. This brush is useful to create the fingers for characters.

Soft Brushes

There are two types of Soft brushes, namely the **SoftClay** and **SoftConcrete**, as shown in Figure 2-168. These brushes use alpha images to add detail to an object quickly. By default, the **SoftClay** brush uses a rectangular alpha to add depth and the **SoftConcrete** brush uses a stone like alpha to add depth to an object, refer to Figures 2-169 and 2-170. In the **SoftClay** brush, the edges of the alpha image are smooth. However, in the **SoftConcrete** brush, the edges of the alpha image are hard.

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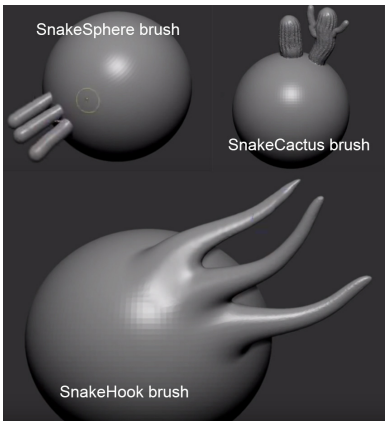


Figure 2-167 *Strands pulled out using the Snake brushes*

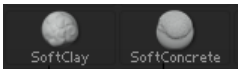


Figure 2-168 *The soft brushes*



Figure 2-169 *Rectangular alpha added using the* ***SoftClay*** *brush*

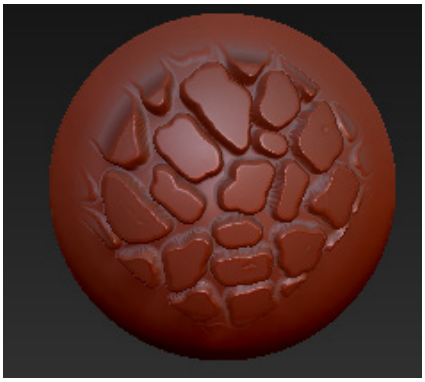


Figure 2-170 *A stone like alpha added using the* ***SoftConcrete*** *brush*

Spiral Brush



The **Spiral** brush is used to create twisted displacement in the surface of an object, refer to Figure 2-171.

sPolish Brush



The **sPolish** brush stands for the soft polish brush. This brush is used to smoothen or polish the extruded surface of an object.

Standard Brush



The **Standard** brush is the default brush in ZBrush. It raises the surface of a mesh or pushes it inward, depending on the settings made. If you choose the **Z Add** button, the surface of the mesh will be raised. In organic modeling, the **Standard** brush can be used to sculpt a nose on the face of a character. Similarly, if you choose the **Zsub** button, the surface of the mesh will be pushed inwards. While modeling human faces, it can be used to sculpt eye sockets on the face of a character.

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The **Z Intensity** slider will determine the strength of the stroke. Higher the value of intensity, higher will be the degree of elevation. The **Draw Size** slider helps you in controlling the size of the brush and the **Focal Shift** slider controls the softness or fall off of the edge of the brush. If you sculpt with the **Zadd** button chosen and hold the ALT key, the surface will be pushed inward instead of being raised. Similarly, holding the ALT key with the **Zsub** button chosen will raise the surface of an object. Figure 2-172 shows a sphere sculpted by using the **Zadd** and **Zsub** settings of the **Standard** brush.



Figure 2-171 *Twisted displacement produced by using the* ***Spiral*** *brush*



Figure 2-172 *A sphere sculpted by the* ***Standard*** *brush*

StitchBasic Brush



The **StitchBasic** brush is used to create a pattern of stitches on the surface of an object. This brush is ideal for sculpting clothes and leather accessories.

Topology Brush



The **Topology** brush is used to create a new mesh on an existing object. This brush is ideal for creating accessories on a human model. This brush can be used if the geometry has not been subdivided. This brush will be discussed in detail in later chapters.

Transpose Brush



The **Transpose** brush is used to move, rotate, or scale an object. This brush can also be used to pose a character. To invoke this brush, choose the Current Brush button from the left shelf; a flyout containing different sculpting brushes will be displayed. Choose the **Transpose** brush from this flyout; an action line will be displayed on the surface of the spiral, refer to Figure 2-173.

Press and hold the left mouse button and drag the cursor on the surface of the spiral; the size of action line will be increased, refer to Figure 2-174.

On choosing the **Transform** brush, you will notice that the **Move** button in the top shelf gets automatically chosen. This button will enable you to move the spiral in the canvas. To move the spiral, hover the cursor over the center of the circle that is at the middle on the action line and

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then press and hold the left mouse button. Next, drag the cursor; the position of the spiral will change in the canvas accordingly.

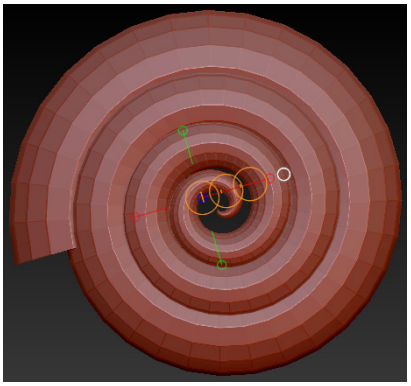


Figure 2-173 *Action line displayed on the spiral*

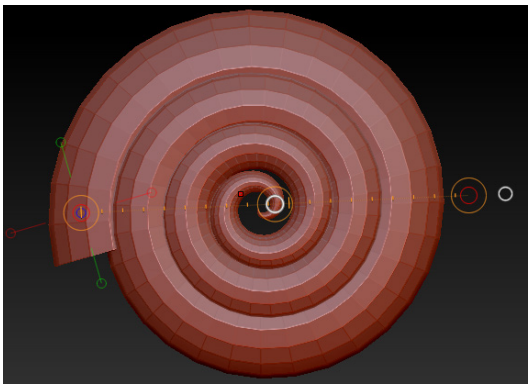


Figure 2-174 *Size of the action line increased*

To scale the spiral, choose the **Scale** button from the top shelf and hover the cursor over the center of the circle that is at the middle on the action line and then drag the cursor in the canvas; the spiral will be scaled, refer to Figures 2-175 and 2-176.

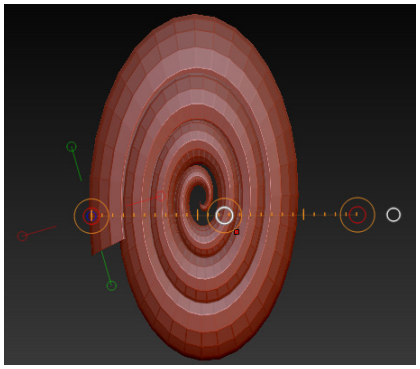


Figure 2-175 *Spiral scaled up vertically*

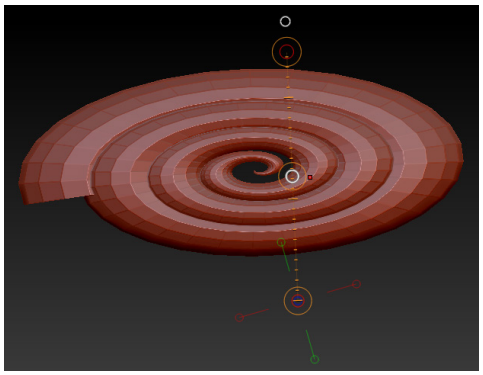


Figure 2-176 *Spiral scaled up horizontally*

To scale the spiral uniformly, hover the cursor at the centre of the end most circles of the action line and then press and hold the left mouse button. Next, drag the cursor in the canvas area; the spiral will be scaled uniformly. Similarly, you can rotate the spiral in the canvas by choosing the **Rotate** button from the top shelf.



Note

To change the position of the action line on the surface of an object, drag the cursor on the object at different positions; the action line will be displayed at those positions. To flip the direction of the action line, click on the green circle at the end of the action line.

You can also bend the surface of an object by using the **Transpose** brush. To do so, create an object in the canvas and convert it into polymesh. Next, choose the **Transpose** brush; a small action line will be created on the surface of the object. Press and hold the left mouse button and drag the cursor on the surface of the object; the size of the action line will be increased, refer to

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Figure 2-177. Hover the cursor over the center of the circle that is at the middle on the action line. Press and hold the ALT key and the left mouse button and drag the cursor downward; the surface of the object will be bent, refer to Figure 2-178.

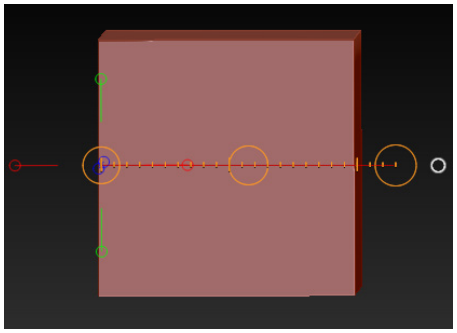


Figure 2-177 *Action line displayed on the spiral*

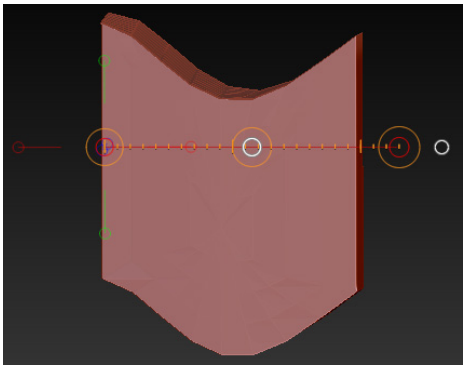


Figure 2-178 *Surface of the cube bent using the* ***Transpose*** *brush*

TransposeSmartMask Brush

The **TransposeSmartMask** brush is used to mask distinct areas of a surface. This brush detects the curved areas in the surface and creates a mask around them. To understand the working of this brush, choose the **LightBox** button from the top shelf; the **LightBox** browser will be displayed. In the **Tool** tab of this browser, double-click on the **Dog.ZTL** file. Press and hold the left mouse button and drag the cursor on the canvas; the model of the dog will be loaded in the canvas, refer to Figure 2-179.

After loading the model, choose the **Edit** button from the top shelf, and then choose the **TransposeSmartMask** brush. Press and hold the CTRL key and the left mouse button and drag the cursor on the surface of the model; the size of action line will increase and a mask will be created on the top area of the model, refer to Figure 2-180. To increase the area of the mask, drag the cursor on the surface of the model such that its size is increased significantly, refer to Figure 2-181.



Figure 2-179 *Model of the dog created in the canvas*

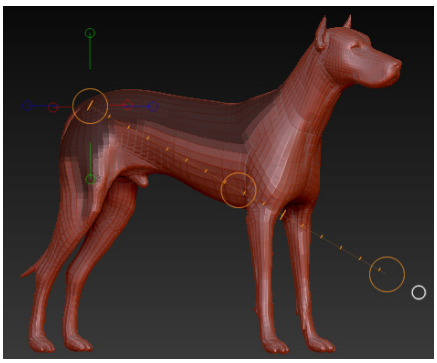


Figure 2-180 *Mask created on the top area of the model*

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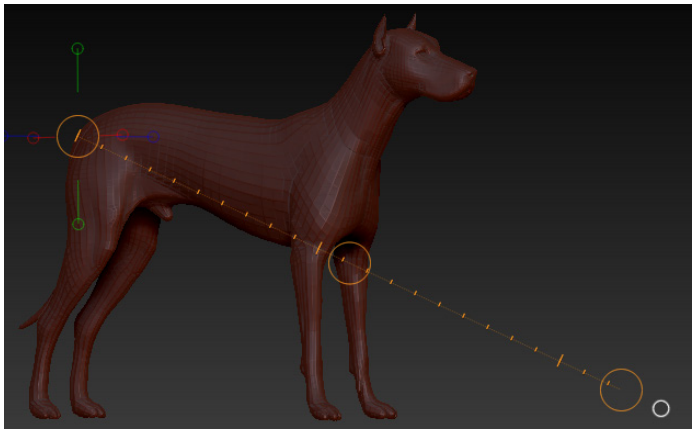


Figure 2-181 *Mask created on the entire surface of the model*

Trim Brushes

The Trim brushes are used to make the surface of an object flat. There are six types of Trim brushes namely: **TrimAdaptive**, **TrimCircle**, **TrimCurve**, **TrimDynamic**, **TrimLasso**, and **TrimRect**, refer to Figure 2-182. The **TrimAdaptive** brush is used to create planes on the curved surface by slicing the curve. The **TrimCircle** brush uses circular shape to slice the geometry and create new polygons. The **TrimCurve** brush uses curves or straight lines to slice the geometry and create new polygons. The **TrimDynamic** brush creates planes on the surface and maintains the curvature of the surface. The **TrimLasso** brush uses desired shape to slice the geometry and create new polygons. The **TrimRect** brush works similar to **TrimCircle** brush with the only difference that it uses a rectangular marquee selection to slice the geometry and create new polygons on the squeezed area.

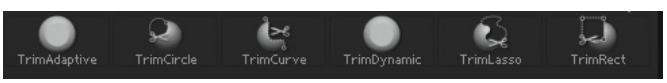


Figure 2-182 *The Trim brushes*

Weave1 Brush



The **Weave1** brush is used with different alphas to create different patterns on an object, refer to Figure 2-183.

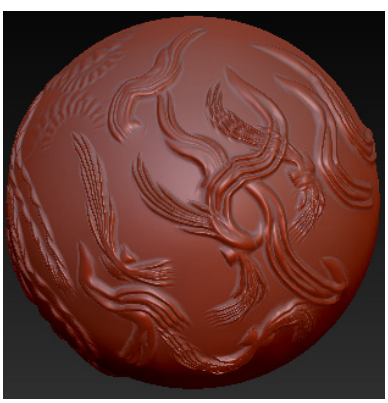


Figure 2-183 *Different patterns created using the* ***Weave1*** *brush*

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XTractor Brush



This brush is used to copy the sculpting details from one area to the other area of the model. You can capture sculpted details by pressing the G key and then dragging a path along the detailed surface that you intend to capture into an alpha. Once those details are captured into an alpha, you can reapply the details to other areas along a stroke path. You can add fine details to the copied area by using the **Focal Shift** slider and the **Draw Size** slider.

XTractor DragDot Brush



The **Xtractor DragDot** brush is used capture the sculpt details by clicking once on any point of a sculpted surface. To capture the selected area as an alpha, press G. Once the alpha has been captured, you can reapply the alpha by clicking on the surface and dragging the detail in different position.

XTractor DragRect Brush



The **XTractor DragRect** brush is used to capture sculpted details by clicking and dragging over a sculpted surface. To capture a region as an alpha, press G. Once the alpha has been captured, you can reapply the details in the same way as discussed above.

ZProject Brush



The **ZProject** brush is mainly used in texturing. If you want to texture a human face, then you need to keep the reference image along with the 3D model in the canvas area. By using the **ZProject** brush, you can transfer the texture from the reference image into your 3D model. The **ZProject** brush uses the Z axis of the canvas to transfer sculpting and texturing details either from the canvas or from other subtools. This brush will be discussed in detail in later chapters.

ZRemesherGuides Brush



The **ZRemesherGuides** brush is used to control the flow of edges in geometry. This brush is used in combination with the **ZRemesher** feature. The **ZRemesher** is used to edit the existing topology of an object. The **ZRemesherGuides** brush facilitates this by enabling you to draw curves on the surface of an object. These curves decide the edge loop flow in the geometry. The **ZRemesher** features and the **ZRemesherGuides** brushes will be discussed in detail in the later chapters.

ZModeler



The **ZModeler** brush is used for modeling. This brush contains most of the common functions that can be applied in 3D modeling. The **ZModeler** brush functions in two parts: Actions and Targets. Both functions are correlated to each other. The action is the function itself and the target is the object to which the action will be applied. To understand the function of this brush, first create a 3D primitive object in the canvas. To do so, choose the Current Tool button from the **Tool** palette; a flyout will be displayed, refer to Figure 2-6. Choose the **Cube3D** primitive from this flyout. Next, press and hold the left mouse button and drag the cursor on the canvas to create a cube. After creating the cube, choose the **Edit** button from the top shelf

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and then choose the **PolyF** from the right shelf. Now, choose the **Initialize** subpalette and then adjust the values in the **Hdivide** and **Vdivide** edit boxes.

Now, choose the **Make PolyMesh3D** button from the **Tool** palette; the primitive object will be converted into a polymesh. Choose the **Current Brush** button from the left shelf; a flyout containing different sculpting brushes will be displayed. Choose the **ZModeler** brush from this flyout, as shown in Figure 2-184. If required, adjust the size of the brush using the [or] key. Now, when you hover the cursor over the polygon area of the primitive, the red squared highlighted area will be displayed, as shown in Figure 2-185. Right-click on the highlighted area; the **ZMODELER** window will be displayed, a shown in Figure 2-186. After that you can choose **Extrude** from the **Polygon Actions** area and **A Single Poly** from the **Target** area. Next, in the canvas area, you can drag the cursor to extrude the selected polygon.



Figure 2-184 *Choosing the* ***ZModeler*** *brush from the flyout*

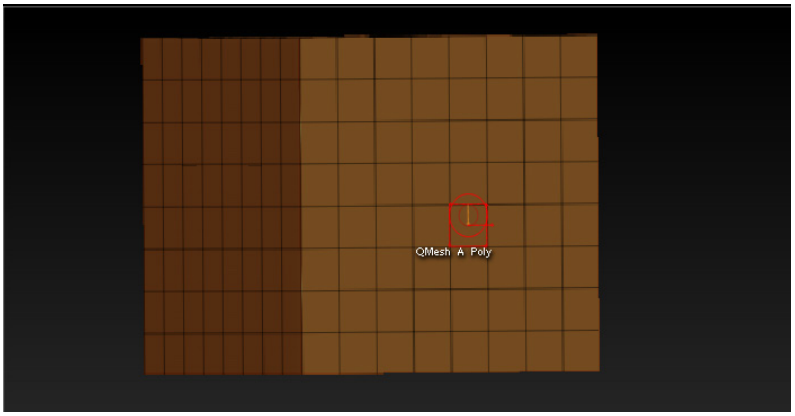


Figure 2-185 *The highlighted area of the primitive*

Next, hover the mouse on the edge/point of the primitive and then right-click; the **ZMODELER** window will be displayed with respective options for edge/point, as shown in Figures 2-187 and 2-188. You can use these options for quickly generating a wide variety of shapes.

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Figure 2-186 *The* ***ZMODELER*** *window*

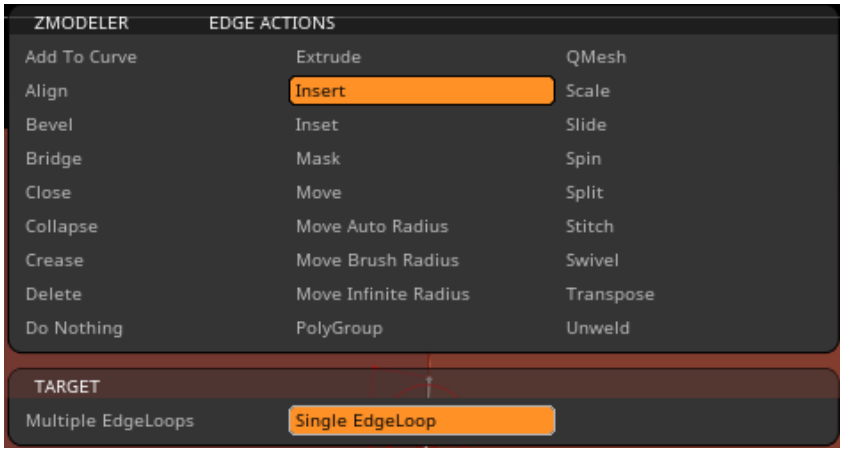


Figure 2-187 *The* ***ZMODELER*** *window with options corresponding to edge*

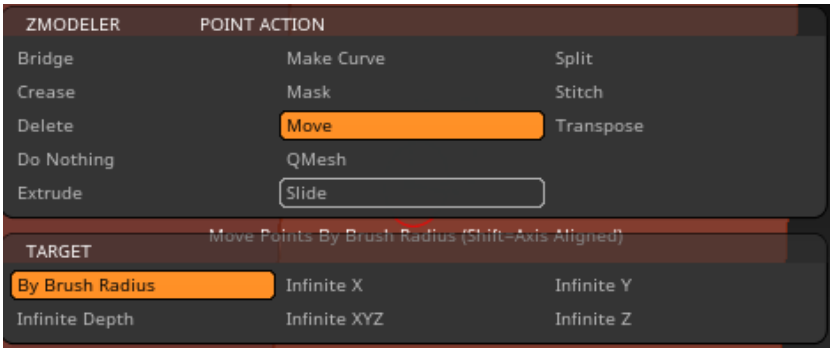


Figure 2-188 *The* ***ZMODELER*** *window with options corresponding to point*

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Self-Evaluation Test

Answer the following questions and then compare them to those given at the end of this chapter:

1. Which of the following hot keys is used to activate the Clip brushes?

   (a) CTRL+ALT (b) CTRL+SHIFT
   (c) CTRL (d) None of these

2. The _____ brush is used to add wrinkles to an object.

3. The _____ brushes are used in the **Quick Sketch** mode or painting on the polygons.

4. The _____ brush is used mainly in texturing.

5. The _____ brush is used to create a pattern of stitches on the surface of an object.

6. The _____ brush is used to control the flow of edges in the geometry.

7. The _____ brush is used to control the cloth drape.

8. The **Divide** button in the **Geometry** subpalette is used to decrease the number of polygons in a mesh. (T/F)

9. The **MatchMaker** brush is used to fit one mesh into the contours of another mesh. (T/F)

10. The **Smooth** brush is activated by pressing the ALT key. (T/F)

11. Each time you subdivide a model with subdivision history using the **Divide** button, the **SDiv** slider should be at its highest setting. (T/F)

12. The **Hatch** brush is used to apply sculpting strokes on the object without picking up cursor. (T/F)

Review Questions

Answer the following questions:

1. Which of the following keys activates the alternate mode for the **Z Add** button and the **Z Sub** button?

   (a) ALT (b) SHIFT
   (c) CTRL (d) SPACEBAR

2. The term IMM stands for _____ .

3. The _____ brush is used to add organic details to an object.

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4. The _____ brush is used to create a new mesh on the surface of an object by drawing curves for the new mesh.

5. The _____ brush uses a circular stroke to create a mask on the surface of an object.

6. The **Inflat** brush is used to expand the surface of an object by a significant amount. (T/F)

7. The **Rake** brush is used to isolate a certain region of an object. (T/F)

8. The **Transpose** brush is activated when the brush is in the **Draw** mode. (T/F)

9. The **CurveBridge** brush is used to create a bridge geometry between two curves. (T/F)

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Answers to Self-Evaluation Test

1. b, **2. Crumple**, **3.** Pen, **4. ZProject**, **5.** Eight, **6. QRemesherGuide**, 7. **ClothPull 8.** F, **9.** T, **10.** F, **11.** T 12. T

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