# Chapter 5

# ZSpheres

## Learning Objectives

***After completing this chapter, you will be able to:***

- *Work with ZSpheres*
- *Understand ZSketching*
- *Understand rigging using ZSpheres*
- *Create basic models using ZSpheres*



# INTRODUCTION

ZSpheres are the modeling tools that can be connected to a network to create a basic structure of a model. You can access ZSpheres from the **Tool** palette. These tools are commonly used in organic modeling. In this chapter, you will learn about the process of creating an armature using ZSpheres.



**Note**

*In this chapter, the background color of the canvas has been changed to white to help you to view the images better. To change the background color of the canvas, set the color in both the **Secondary Color** and **Main Color** swatches in the left shelf to white. Next, choose the **Document** palette. In this palette, set the value of the **Range** slider to **0**, refer to Figure 5-1. The **Range** slider is used to add the gradient effect. If its value is set to **0**, no gradient will be displayed. Choose the **Back** button in this palette; the color of the canvas will change to white.*




***Figure 5-1** The value of the **Range** slider set to **0***

# CREATING ARMATURES USING ZSPHERES

To create a ZSphere in the canvas, choose the Current Tool button in the **Tool** palette; a flyout will be displayed. In this flyout, choose **ZSphere** from the **3D Meshes** area, refer to Figure 5-2. Next, press and hold the left mouse button and drag the cursor in the canvas area; a double colored ZSphere will be created, as shown in Figure 5-3. After creating the ZSphere, choose the **Edit** button from the top shelf.




***Figure 5-2** **ZSphere** chosen from the **3D Meshes** area of the flyout*

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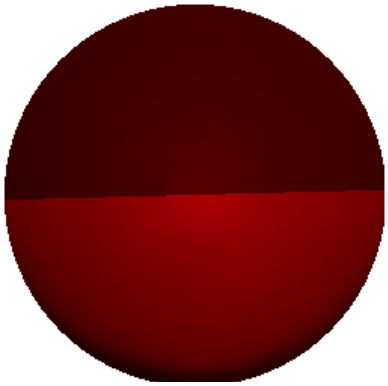


***Figure 5-3*** *A double colored sphere created in the canvas*



**Note**

*After creating a ZSphere in the canvas, make sure you choose the* ***Edit*** *button in the top shelf.*

Hover the cursor over the ZSphere; three concentric circles connected with a line will be displayed on the surface of the ZSphere, refer to Figure 5-4. On moving the cursor over the surface of ZSphere, you will notice that the color of the innermost circle switches between red and green. The innermost circle will turn green as you hover the cursor over specific parts of the ZSphere. The green circle indicates the best place to add a new ZSphere. When you press and hold the left mouse button and drag the cursor; a new ZSphere will be created on the existing ZSphere, refer to Figure 5-5.

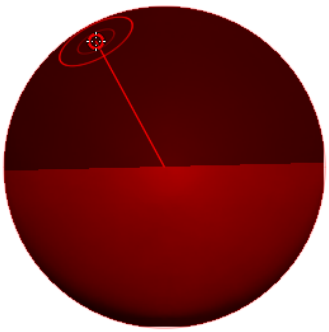


***Figure 5-4*** *Concentric circles displayed on the surface of ZSphere*

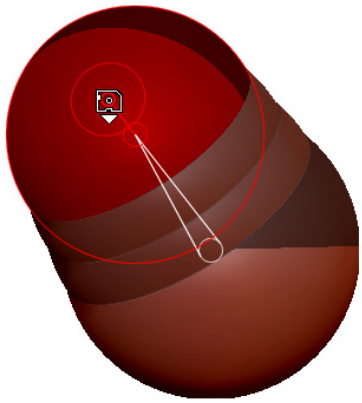


***Figure 5-5*** *New ZSphere created*

The new ZSphere will be connected to the previous ZSphere through a network of linked spheres. The white colored triangular icon displayed between two ZSpheres resembles the way bones are drawn.

You can move, rotate, or scale the ZSpheres as required. For moving a ZSphere, choose the **Move** button from the top shelf. On doing so, the **Draw** button will be deactivated. Next, select the newly created ZSphere by clicking on it, if not already selected, and move it away from the

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previous ZSphere. You will notice that the number of linked spheres between the two ZSpheres has increased and the size of the triangular icon has also increased, refer to Figure 5-6.

Similarly, you can scale and rotate the ZSpheres using the **Scale** and **Rotate** buttons, respectively. The linked spheres between the two ZSpheres can neither be moved, scaled, or rotated. However, if you want to move, scale, or rotate any of these linked spheres, you need to convert them into editable ZSpheres. To do so, choose the **Move** button from the top shelf, and click on the ZSphere which you want to move or rotate. On doing so, the sphere will be converted into an editable ZSphere, refer to Figure 5-7. After converting the linked sphere into an editable ZSphere, you can move or scale it as required, refer to Figures 5-8 and 5-9.

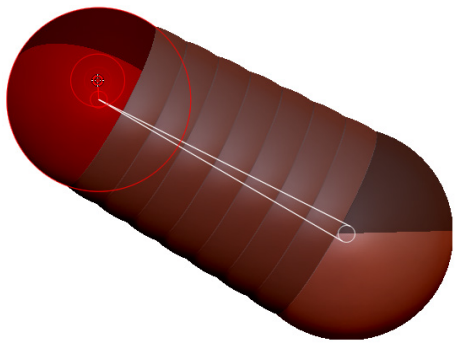


***Figure 5-6*** *Newly created ZSphere moved away from the previous ZSphere*

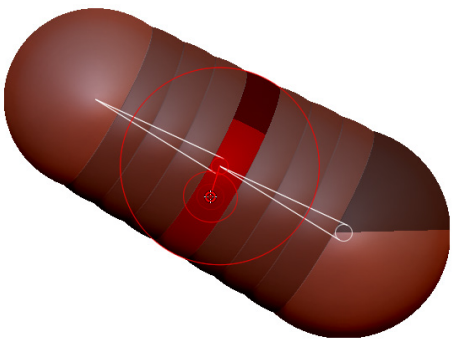


***Figure 5-7*** *Linked sphere converted into an editable ZSphere*

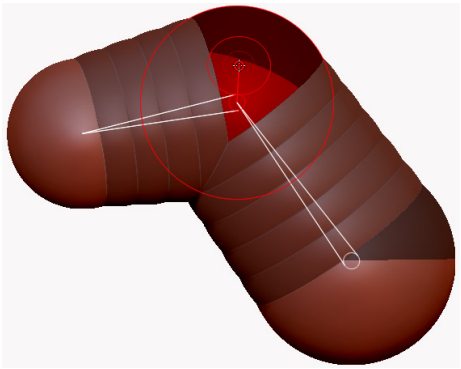


***Figure 5-8*** *The ZSphere moved using the* ***Move*** *button*

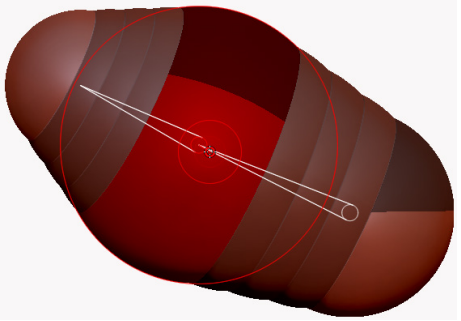


***Figure 5-9*** *The ZSphere scaled using the* ***Scale*** *button*

By converting the linked spheres into the editable ZSpheres, you can create different types of structures by moving, rotating, or scaling the ZSpheres. In addition to this, you can create different structures by creating new ZSpheres on existing ZSpheres, refer to Figure 5-10.

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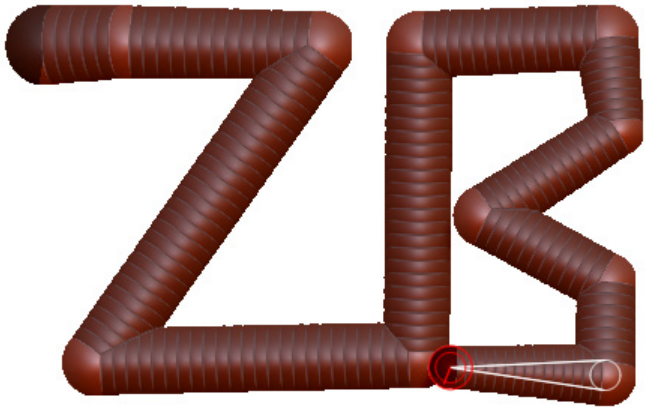


***Figure 5-10*** *Structure created using ZSpheres*

If you want to delete a ZSphere, choose the **Draw** button from the top shelf. Next, press and hold the ALT key and then click on the ZSphere that you want to delete.

To create two similar ZSpheres in a structure, you need to activate symmetry in any of the axes depending on where you want to position them. For instance, in Figure 5-11, similar ZSpheres have been created by activating the symmetry in the X-axis. Similarly, you can create a number of similar ZSpheres by activating the radial symmetry, refer to Figure 5-12. In this figure, the radial symmetry has been activated along the Z-axis.

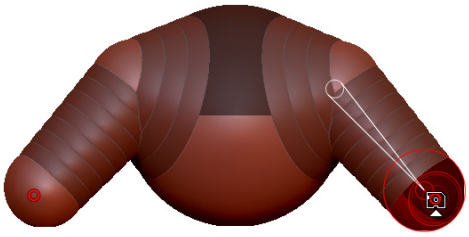


***Figure 5-11*** *Similar ZSpheres created by activating the symmetry in the X axis*

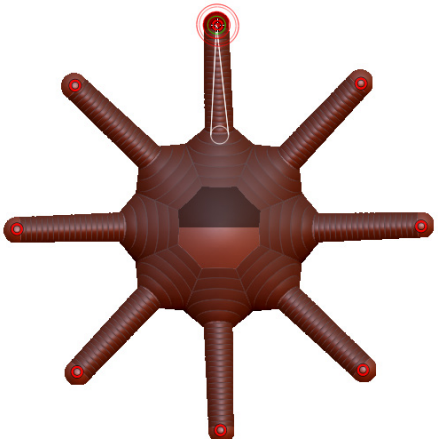


***Figure 5-12*** *Similar ZSpheres created by activating the radial symmetry*

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## Skinning in ZSpheres

Skinning is a process of converting the ZSphere structure into a polygon mesh. The polymesh created from the ZSpheres can be sculpted with the help of different 3D brushes. There are two types of skinning in ZBrush, namely unified skinning and adaptive skinning.

### Unified Skinning

Unified skinning is used to convert a ZSphere structure into a polygon mesh with high poly resolution and equal sized polygons. The mesh produced from unified skinning is very smooth.

To convert a ZSphere into unified skin, create a structure using a network of ZSpheres, refer to Figure 5-13. The thumbnail with the name **ZSphere_1** will be displayed in the **Tool** palette, as shown in Figure 5-14. Next, expand the **Unified Skin** subpalette from the **Tool** palette, as shown in Figure 5-15. In this subpalette, choose the **Make Unified Skin** button; a thumbnail for the new skinned mesh with the name **Skin_ZSphere_1** will be displayed in the **Tool** palette. Next, double-click on this thumbnail; the skinned mesh will be displayed in the canvas. Choose the **PolyF** button in the right shelf to view the distribution of polygons in the skinned mesh. Alternatively, press SHIFT + F, refer to Figure 5-16.

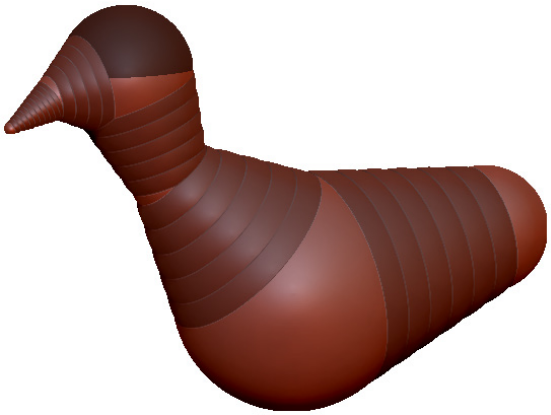


***Figure 5-13*** *ZSphere structure created in the canvas*




***Figure 5-14*** *The thumbnail for the ZSphere displayed*

You can sculpt the skinned mesh using different 3D brushes. Before converting Zsphere framework into a polygon mesh, you can specify the polygon resolution and smoothness of the polygon mesh using the **Resolution** and **Smooth** sliders in the **Unified Skin** subpalette.

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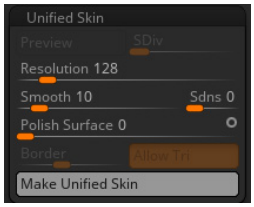



***Figure 5-15*** *The* ***Unified Skin*** *subpalette expanded*

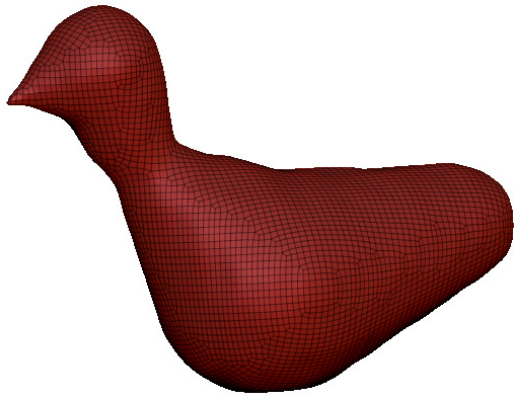


***Figure 5-16*** *The skinned mesh after choosing the* ***PolyF*** *button*

## Adaptive Skinning

Adaptive skinning is the most commonly used skinning technique for the ZSpheres. This technique creates a low polygon mesh from the ZSphere structure. The size of polygons in this mesh is large.

To convert a ZSphere into an adaptive skin, create a structure using a network of ZSpheres, refer to Figure 5-13. Next, expand the **Adaptive Skin** subpalette from the **Tool** palette, as shown in Figure 5-17. In this subpalette, choose the **Make Adaptive Skin** button; a thumbnail for the new skinned mesh with the name **Skin_ZSphere_1** will be displayed in the **Tool** palette. Next, double-click on this thumbnail; the skinned mesh will be displayed in the canvas. Choose the **PolyF** button in the right shelf to view the distribution of polygons in the skinned mesh, refer to Figure 5-18.




***Figure 5-17*** *The* ***Adaptive Skin*** *subpalette chosen*

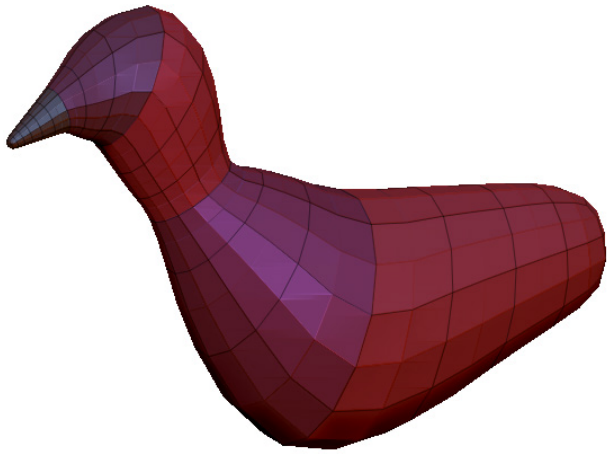


***Figure 5-18*** *The skinned mesh after choosing the* ***PolyF*** *button*

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Before converting a Zsphere structure into a polygon mesh, you can specify the settings for the skinned mesh using the buttons and sliders in the **Adaptive Skin** subpalette. The **Adaptive Skin** subpalette is not displayed in the **Tool** palette, if the **Make Adaptive Skin** button is chosen. The different buttons and sliders in the **Adaptive Skin** subpalette are discussed next.

### Preview

The **Preview** button is used to view the skinned mesh in canvas before the ZSphere structure is converted into adaptive skin. You can also view the skinned mesh in the canvas by pressing the A key. After previewing the skinned mesh, choose the **Preview** button again to switch back to the ZSphere mode or press the A key. Figures 5-19 and 5-20 show a ZSphere structure and its preview, respectively.



***Figure 5-19*** *The ZSphere structure*



***Figure 5-20*** *The preview of the ZSphere structure*

### Density

The **Density** slider is used to increase or decrease the number of polygons in the skinned mesh. If the value in this slider is higher, the skinned mesh will contain more number of polygons and will be smoother. After setting the value of the **Density** slider, choose the **Preview** button to view the results. Figures 5-21 and 5-22 show the preview of the skinned mesh when the value of the **Density** slider is set to **1** and **7**, respectively.

### G Radial

The **G Radial** slider is used to increase or decrease the number of spans in the skinned mesh. To increase or decrease the number of spans, choose the **PolyF** button from the right shelf. After setting the value of the **G Radial** slider, choose the **Preview** button; the preview of the skinned mesh will be displayed. Figures 5-23 and 5-24 show the preview of the skinned mesh with the **G Radial** slider value set to **4** and **20**, respectively and also the value of the **Density** slider is set to **1**.

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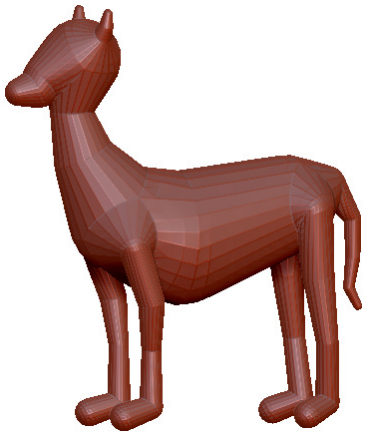


***Figure 5-21*** *Preview of the mesh with the value of the* ***Density*** *slider set to* ***1***



***Figure 5-22*** *Preview of the mesh with the value of the* ***Density*** *slider set to* ***7***



***Figure 5-23*** *Preview of the mesh with the value of the* ***G Radial*** *slider set to* ***4***



***Figure 5-24*** *Preview of the mesh with the value of the* ***G Radial*** *slider set to* ***20***

### Max Twist

The **Max Twist** slider is used to twist the selected ZSphere in the structure. After setting the value of the **Max Twist** slider, choose the **Preview** button; the twisted ZSphere will be displayed.

### Proximity

The **Proximity** slider is used to maintain the flow of geometry between the parent ZSphere and the intersecting ZSpheres that are created on its surface.

### Use Classic Skinning

The **Use Classic Skinning** button is used to switch to the skinning technique that was available in the ZBrush 3 version. On choosing this button, the skinning technique in ZBrush gets deactivated and different settings for classic skinning get activated.

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## ZSketching

ZSketching is a technique that enables you to add a strip of linked spheres to the existing structure of ZSpheres. This technique also enables you to add more depth and detail to a model. After the creation of a ZSphere in the canvas, the **ZSketch** subpalette is displayed in the **Tool** palette, refer to Figure 5-25. The **ZSketch** subpalette consists of different buttons and sliders that help in adding depth to the ZSpheres using freehand sketching. These buttons and sliders are discussed next.

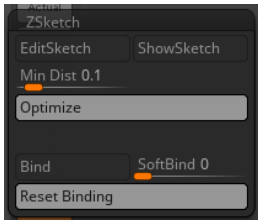



***Figure 5-25*** *The* ***ZSketch*** *subpalette in the* ***Tool*** *palette*

### EditSketch

The **EditSketch** button is used to switch from normal draw mode to ZSketch mode. This button can be chosen by pressing SHIFT+A keys. To switch from normal draw mode to ZSketch mode, create a ZSphere in the canvas and then choose the **Edit** button. Next, expand the **ZSketch** subpalette. In this subpalette, choose the **EditSketch** button; the color of the ZSphere changes, refer to Figure 5-26. Next, press and hold the left mouse button and hover the cursor on the surface of the ZSphere and then drag the cursor to sketch different shapes using the strips of linked spheres, refer to Figure 5-27.

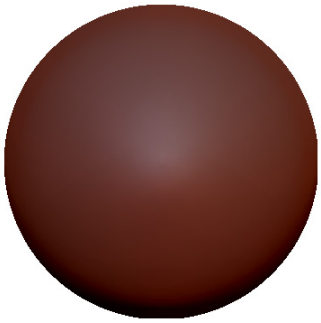


***Figure 5-26*** *The color of the ZSphere changed*



***Figure 5-27*** *Different shapes created using the strips of ZSpheres*

You can view the polymesh preview of the ZSketch by pressing the A key. In the preview of the ZSketch, you will notice that the parent ZSphere on which the sketching was done is not displayed, refer to Figure 5-28. To switch back to the ZSketching mode, press the A key again.

### ShowSketch

The **ShowSketch** button is used to make the sketched strips of linked spheres transparent. This button enables you to adjust the underlying ZSphere structure as required. To make the sketched strips of linked spheres transparent, consider ZSpheres, refer to Figure 5-29, in which the symmetry has been activated in the X-axis. Expand the **ZSketch** subpalette. In this subpalette, choose the **EditSketch** button; the color of the ZSphere structure changes. Adjust the brush size as required. Press and hold the left mouse button and drag the cursor to create a sketch on the surface of the structure, refer to Figure 5-30. Choose the **EditSketch** button again to deactivate

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it. Next, choose the **ShowSketch** button; the sketched strips will be displayed with transparency, refer to Figure 5-31. The transparency in the strips enables you to adjust the underlying ZSphere structure.

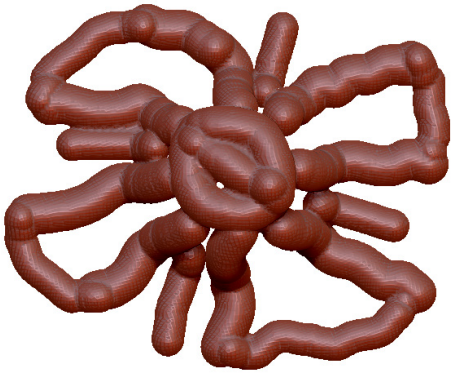


***Figure 5-28*** *Polymesh preview of the ZSketch*

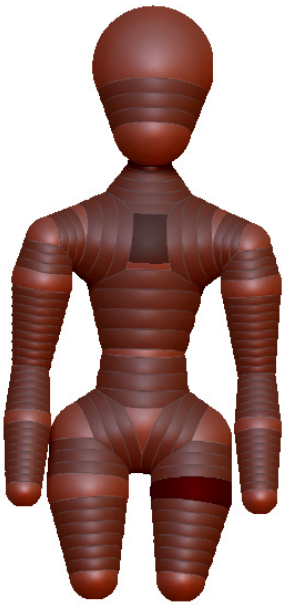


***Figure 5-29*** *A structure created using ZSpheres*



***Figure 5-30*** *ZSketching done on the surface of the structure*

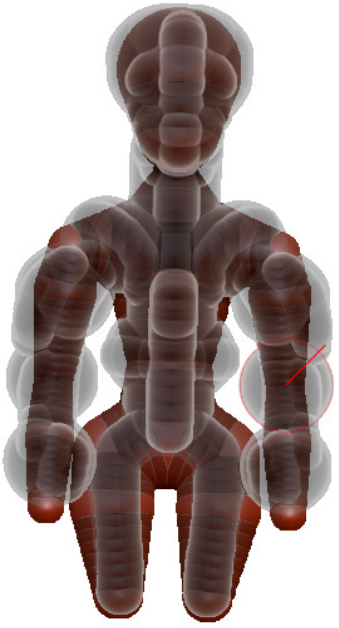


***Figure 5-31*** *Transparency in the sketched strips*

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### Min Dist

The term Min Dist stands for minimum ZSpheres distance. The **Min Dist** slider is used to specify the distance between the linked spheres in the strips that are sketched. Figures 5-32 and 5-33 show the strips with the value of the **Min Dist** slider set to **0.1** and **1**, respectively.

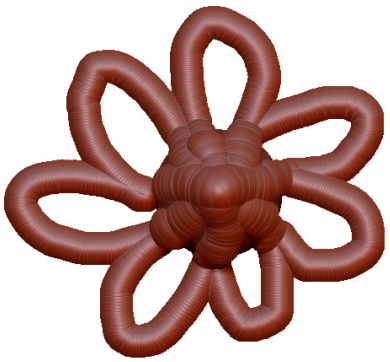


***Figure 5-32*** *Strips with the value of the* ***Min Dist*** *slider set to* ***0.1***

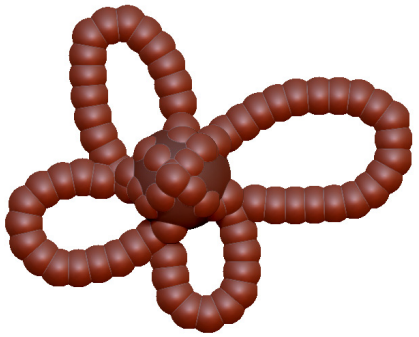


***Figure 5-33*** *Strips with the value of the* ***Min Dist*** *slider set to* ***1***

### Optimize

The **Optimize** button is used to delete the unnecessarily linked spheres present in the strips of sketched spheres. The linked spheres that will be deleted will not be visible in the canvas.

### Bind

The **Bind** button is used to bind the strip of linked spheres with the underlying ZSphere structure. After binding, you will notice that on moving the structure, the sketched strip will also move with it. This button is very useful in posing of the characters that have been created by using the ZSketching technique.

### SoftBind

The **SoftBind** slider is used to specify the level of binding between the underlying structure and sketched strips. The higher value of the **SoftBind** slider produces more realistic results, while posing the characters.

### Reset Binding

The **Reset Binding** button is used to rebind the sketched strips of the linked spheres to the ZSphere structure, if new ZSpheres are added to the existing ZSphere structure.

## Brushes Used in ZSketching

There are about eight types of sculpting brushes that get activated from the Left shelf when you create a ZSphere in the canvas. To access these brushes, choose the Current Brush button; a flyout containing different brushes will be displayed, refer to Figure 5-34. These brushes are used in ZSketching and are discussed next.

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***Figure 5-34*** *Flyout displayed on choosing the Current Brush button*

## Armature Brush

The **Armature** brush is used to sketch the strips of linked spheres in the canvas area. This brush is used for creating arms, legs, and fingers of a character. To sketch the strips of linked spheres, create a ZSphere in the canvas and then choose the **Edit** button. Next, expand the **ZSketch** subpalette. In this subpalette, choose the **EditSketch** button; the color of the ZSphere changes. Activate the symmetry in X-axis by pressing the X key. Next, press and hold the left mouse button and hover the cursor on the surface of the ZSphere, and then drag the cursor outward to create floating strips in the canvas area, refer to Figure 5-35.

After creating the strips using this brush, you will notice that on pressing the A key, only the skinned preview of the strips is displayed and the underlying ZSphere is not displayed, refer to Figure 5-36.



***Figure 5-35*** *Strips created using the* ***Armature*** *brush*

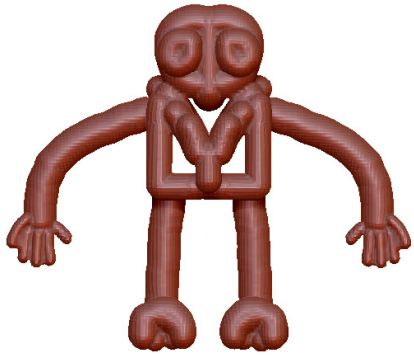


***Figure 5-36*** *The skinned preview of the strips*

## Bulge Brush

The **Bulge** brush is used to bulge out the surface of the strips of linked spheres. If the **Z Intensity** slider is set to its maximum value, the surface of the object will be bulged out by a significant amount, refer to Figure 5-37.

## Sketch Brushes

The sketch brushes are used to sketch the strips of ZSpheres on the surface of an underlying ZSphere. On creating a ZSphere, the **Sketch 1** brush is displayed by default.

## Smooth Brushes

The smooth brushes are used to smoothen the surface of the strips. The level of smoothening depends upon the value of the **Z Intensity** slider. On choosing any of these brushes, a dialog box will be displayed, asking you to press SHIFT key to activate the selected brush. Press SHIFT and then press and hold the left mouse button. Next, drag the cursor on the surface of the strips; the strips will be smoothened, refer to Figure 5-38.

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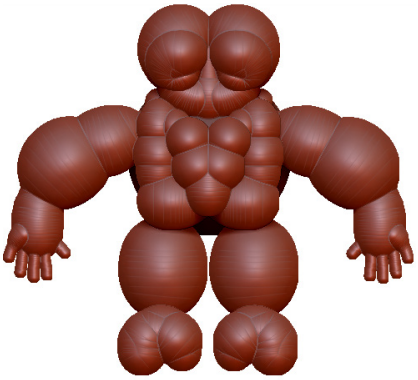


***Figure 5-37*** *Strips bulged out using the* ***Bulge*** *brush*

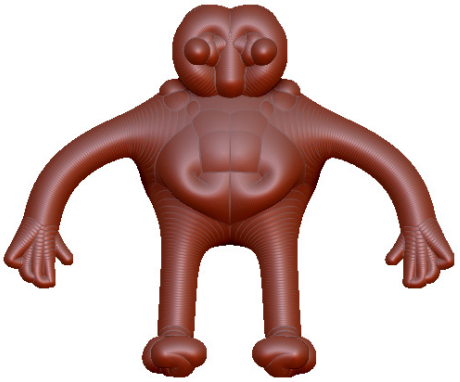


***Figure 5-38*** *Strips smoothened using the* ***Smooth 1*** *brush*

## Rigging Using ZSpheres

Rigging is the process of adding bones and joints to an object. Rigging in ZBrush enables you to pose a character. Rigging in ZBrush is very basic. You can rig a character with the help of the **Rigging** subpalette in the **Tool** palette. The **Rigging** subpalette becomes visible only when a ZSphere is created in the canvas, refer to Figure 5-39.

Before rigging a character in ZBrush, you need to make sure that the character is at its lowest subdivision level. This enables you to pose a character conveniently and produce realistic results as the less number of polygons are easily manageable. To add bones and joints to an object, choose the **DemoSoldier.ZTL** file from the **Tool** tab of the **LightBox** browser, and create it in the canvas, refer to Figure 5-40. After creating the file, make sure that you choose the **Edit** button from the top shelf. Next, expand the **SubTool** subpalette. In this subpalette, choose the **DemoSoldier_1** subtool from the list of subtools, as shown in Figure 5-41.




***Figure 5-39*** *The* ***Rigging*** *subpalette*



***Figure 5-40*** *The DemoSoldier.ZTL file created in the canvas*

Expand the **Geometry** subpalette and set the value of **SDiv** slider to **1**. Next, choose the **Del Higher** button in the **Geometry** subpalette, as shown in Figure 5-42; the character will be displayed at its lowest subdivision level.

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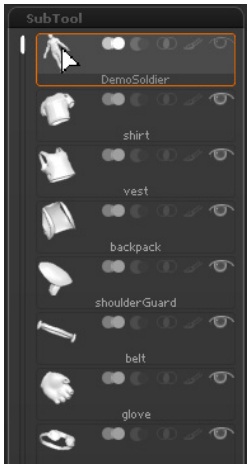



***Figure 5-41*** *The* ***DemoSoldier_1*** *subtool chosen from the* ***SubTool*** *subpalette*

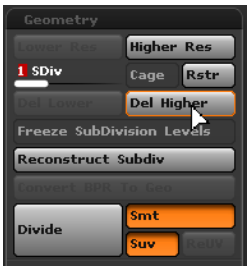



***Figure 5-42*** *The* ***Del Higher*** *button chosen from the* ***Geometry*** *subpalette*

After setting the *DemoSoldier* file to its lowest subdivision level, choose the Current Tool button in the **Tool** palette; a flyout will be displayed. Choose the **ZSphere** primitive from the **3D Meshes** area of this flyout, refer to Figure 5-43; the *DemoSoldier* file will disappear from the canvas and only a ZSphere will be visible in the canvas.

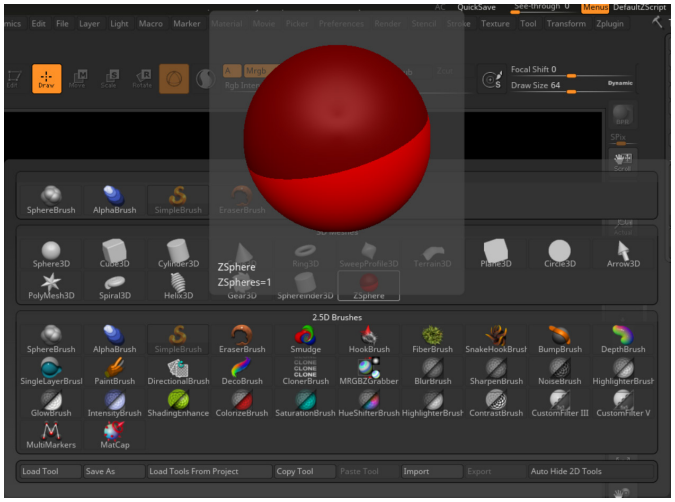



***Figure 5-43*** ***ZSphere*** *primitive chosen from the* ***3D Meshes*** *area of the flyout*

You will notice that after creating the ZSphere, the **Rigging** subpalette will be displayed in the **Tool** palette. From this subpalette, choose the **Select Mesh** button; a flyout consisting of 3D models will be displayed. The **Select Mesh** button enables you to choose the model that you want to rig. Choose the **DemoSoldier_1** model from this flyout, refer to Figure 5-44; the transparent model of the file will be displayed in the canvas, refer to Figure 5-45. Next, use the ZSphere visible at the middle of the model as the reference and activate the symmetry in the X axis. Using the ZSpheres, create the structure, as shown in Figure 5-46.

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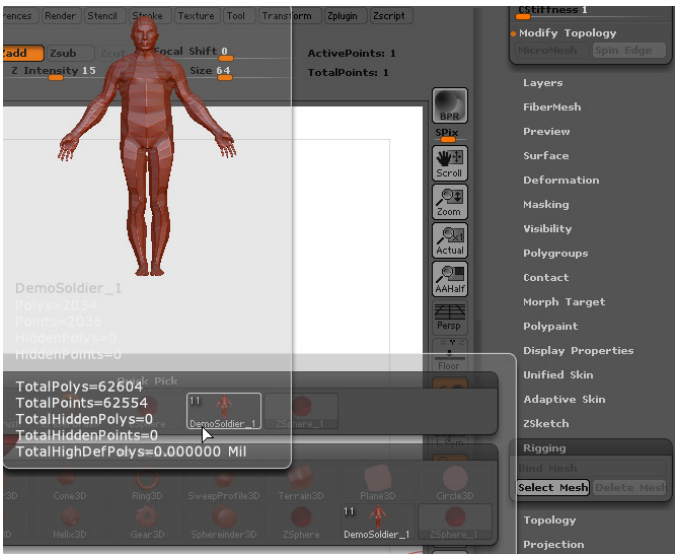



***Figure 5-44 DemoSoldier_1*** *chosen from the flyout*

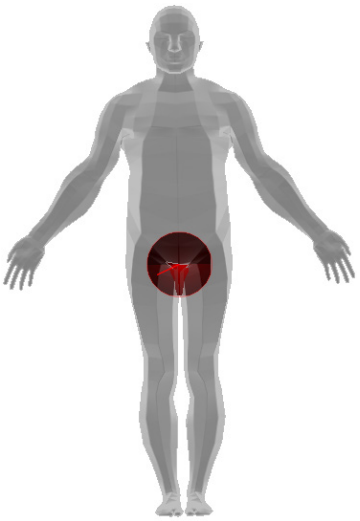


***Figure 5-45*** *The transparent model displayed in the canvas*

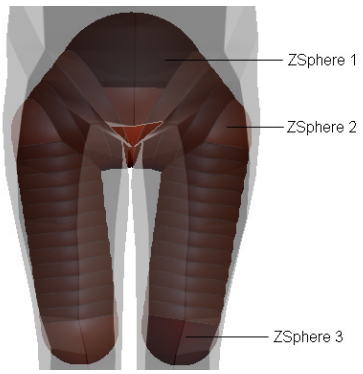



***Figure 5-46*** *Structure created using the ZSpheres*

Create a structure of a body inside the transparent model. While creating the structure, make sure you create new ZSpheres at the shoulders, elbows, and knees. If required, move and scale the ZSpheres such that the structure fits into the model, refer to Figure 5-47. In this figure, the editable ZSpheres have been highlighted. After creating the structure, choose the **Bind Mesh** button from the **Rigging** subpalette; the transparent model will bind with the ZSphere structure created. On moving the ZSpheres in the structure, the model will also move. Select the ZSphere from the elbow area and then move it upward; the elbow of the model will also move upward. Thus, creating a bend in the arm of the model, refer to Figure 5-48. Similarly, you can create bend in the knees of the model.

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After posing the model, you need to skin it. To skin the model, expand the **Adaptive Skin** subpalette. In this subpalette, choose the **Make Adaptive Skin** button. Next, choose the thumbnail for the skinned model from the **Tool** palette; the posed model will be displayed in the canvas, refer to Figure 5-49. The posed model will not be smooth. To make it smooth, set the value of the **SDiv** slider in the **Geometry** subpalette to **5** by using the **Divide** button, refer to Figure 5-50.

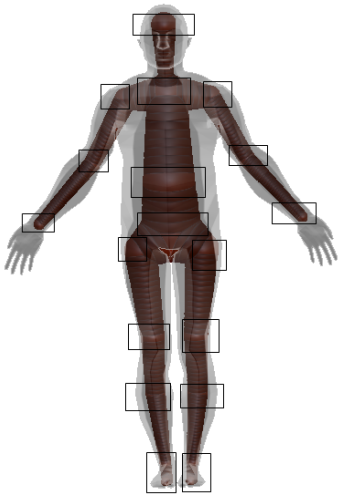


***Figure 5-47*** *Structure created inside the transparent model*

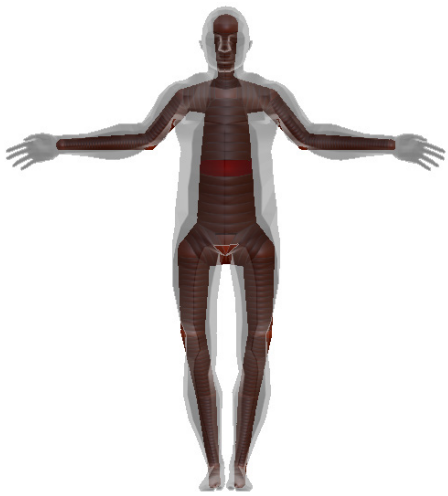


***Figure 5-48*** *Bend created in the elbow of the model*

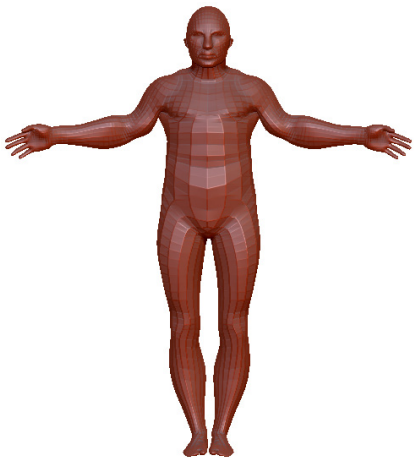


***Figure 5-49*** *The skinned model displayed in the canvas*



***Figure 5-50*** *The model smoothened by setting the value of the* ***SDiv*** *slider to* ***5***

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# TUTORIALS

Before you start the tutorials of this chapter, navigate to *\Documents\ZBrushprojects* and then create a new folder with the name *c05*.

## Tutorial 1

In this tutorial, you will create the basic shape of a human body using ZSpheres. The final output of the model is shown in Figure 5-51. **(Expected time: 30 min)**



***Figure 5-51*** *Basic shape of the human body*

The following steps are required to complete this tutorial:

a. Create the torso of the human body.
b. Create the limbs.
c. Create the neck and the head.
d. Save the model.

### Creating the Torso of the Human Body

In this section, you will create the torso of the human body using a framework of ZSpheres.

1. Choose the Current Tool button from the **Tool** palette; a flyout is displayed. In this flyout, choose the **ZSphere** primitive and create it on the canvas, as shown in Figure 5-52. Next, choose the **Edit** button from the top shelf.

2. Activate the symmetry in the X-axis by pressing the X key. Hover the cursor at the centre of the bottom portion of the ZSphere; a green circle is displayed, as shown in Figure 5-53.

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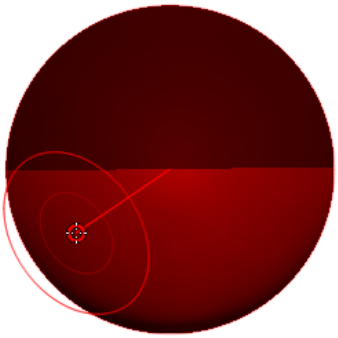


***Figure 5-52*** *ZSphere created in the canvas*

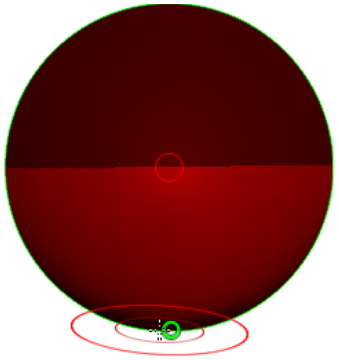


***Figure 5-53*** *Green circle displayed*

3. Create a second ZSphere at the position where the green circle is displayed, as shown in Figure 5-54.

4. Similarly, create a third ZSphere at the centre of the top portion of the ZSphere, refer to Figure 5-55. If required, choose the **Move** button from the top shelf and position the ZSpheres such that they lie in a straight line.

5. Choose the **Scale** button from the top shelf. Next, select the middle ZSphere by clicking on it. Press and hold the left mouse button and drag the cursor inward to scale down the ZSphere, as shown in Figure 5-56.

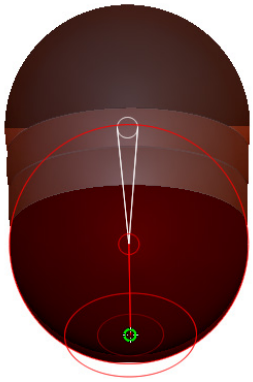


***Figure 5-54*** *Second ZSphere created below the existing ZSphere*

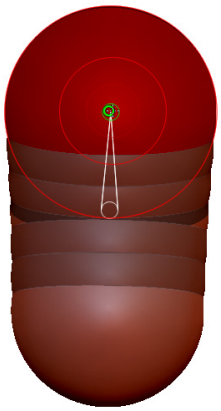


***Figure 5-55*** *Third ZSphere created above the existing ZSphere*

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## Creating the Limbs

In this section, you will create the hands and legs of the human body by creating new ZSpheres on the existing structure.

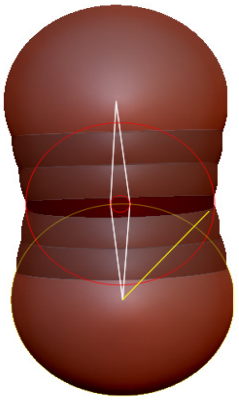


***Figure 5-56*** *Middle most ZSphere scaled using the* ***Scale*** *button*

1. Choose the **Draw** button from the top shelf. Next, hover the cursor on the right side of the bottom ZSphere and create a ZSphere for the hips. As the symmetry is activated in the X-axis, a ZSphere is also created on the left side, refer to Figure 5-57.

2. Press and hold the left mouse button and drag the cursor in the canvas area toward the right till the side view of the structure is displayed. Next, move the newly created ZSpheres slightly backwards and position them, as shown in Figure 5-58. Again, switch back to the front view by dragging the cursor in the canvas area toward the left.



***Figure 5-57*** *ZSphere created for the hips*

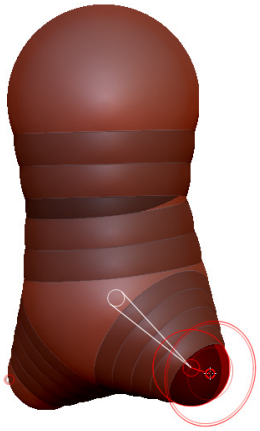


***Figure 5-58*** *Positioning ZSphere in the side view*

3. Create the ZSpheres for the shoulders of the body, refer to Figure 5-59. Position the shoulders in the side view, as discussed in Step 2.

4. Hover the cursor on the ZSphere created for the hips of the body. Next, create a new ZSphere on it and move it downward, as shown in Figure 5-60.

5. Create new ZSpheres for the arms and legs of the body and move them downward, refer to Figure 5-61.

6. Make sure the **Draw** button is chosen in the top shelf. Next, insert two editable ZSpheres on the legs by clicking on two linked ZSpheres, refer to Figure 5-62. Choose the **Scale** button from the top shelf and scale up the inserted ZSpheres, as shown in Figure 5-62.

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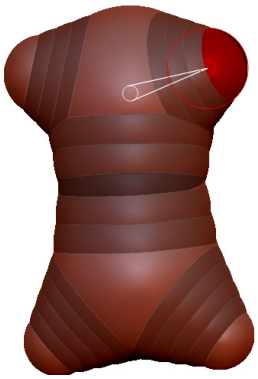


***Figure 5-59*** *ZSphere created for the shoulders*

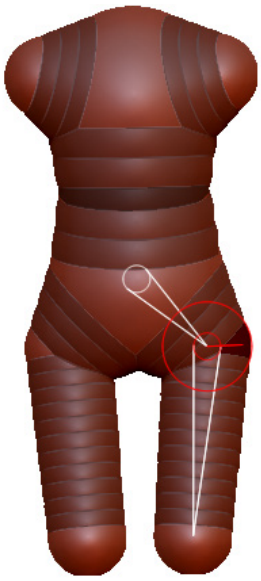


***Figure 5-60*** *ZSphere created and moved downward*

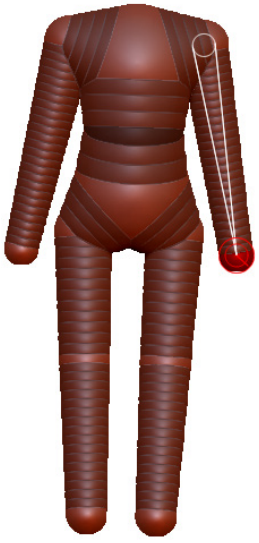


***Figure 5-61*** *ZSpheres created for the legs and the arms*

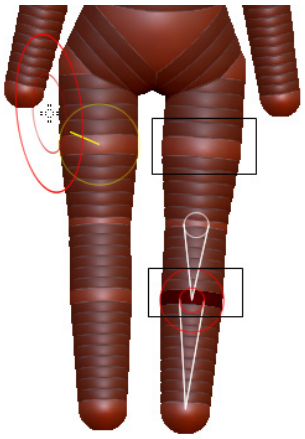


***Figure 5-62*** *Two new ZSpheres inserted and scaled*

7. Press and hold the left mouse button and drag the cursor in the canvas area toward the right till the side view of the structure is displayed. Next, choose the **Move** button from the top shelf and move the ZSpheres on the legs to position them, as shown in Figure 5-63. Switch back to the front view by dragging the cursor toward the left.

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8. Choose the **Draw** button from the top shelf and create two new ZSpheres for the feet of the body. Next, choose the **Move** button and move the newly created ZSpheres toward the front. Choose the **Scale** button and scale up the middle ZSphere, as shown in Figure 5-64.

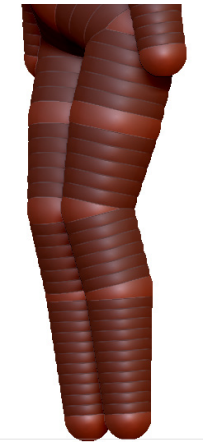


***Figure 5-63*** *The ZSpheres adjusted in the side view*

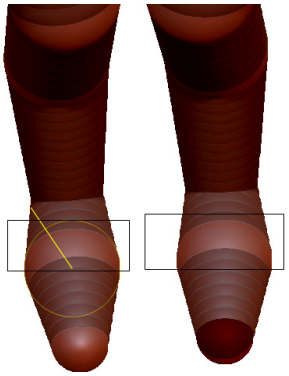


***Figure 5-64*** *Middle ZSphere scaled up*

9. Insert two editable ZSpheres on the arms by clicking on the two linked ZSpheres, refer to Figure 5-65.

10. Press and hold the left mouse button and drag the cursor in the canvas area toward the right till the side view of the structure is displayed. Next, move the inserted ZSpheres slightly backward in the side view to create a bend in the elbow, refer to Figure 5-65.

11. Create a new ZSphere for the palm of the hand, and move it downward, as shown in Figure 5-66.

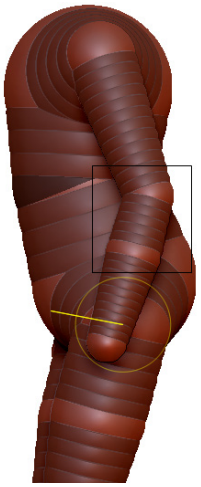


***Figure 5-65*** *Two new ZSpheres inserted and positioned in the side view*

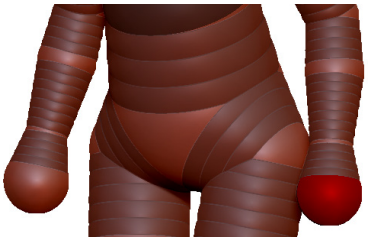


***Figure 5-66*** *New ZSphere created for the palm and moved downward*

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12. Choose the **Move** button from the top shelf and select the ZSphere created for the palm. You will notice that its color changes. Hover the cursor at the area that divides the red and maroon tones of the ZSphere, as shown in Figure 5-67. Next, choose the **Draw** button and create a ZSphere for the knuckle of thumb and move it outward, as shown in Figure 5-68.

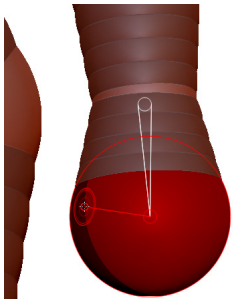


***Figure 5-67*** *Cursor hovered at the area dividing the red and maroon tones of the ZSphere*

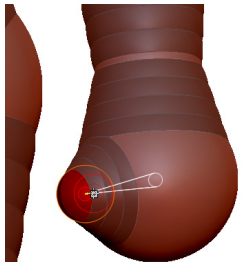


***Figure 5-68*** *ZSphere created and moved outward*

13. Create four more ZSpheres for the knuckles of the rest of the fingers and move them outward, as shown in Figure 5-69.

14. Create new ZSpheres for the thumb and the index finger and then move them outward, as shown in Figure 5-70.

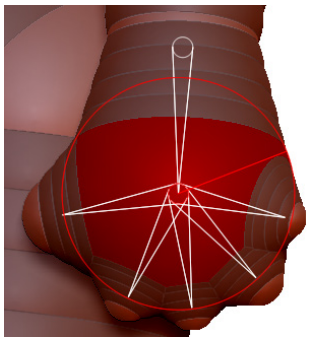


***Figure 5-69*** *Knuckles created for all the fingers of the hand*

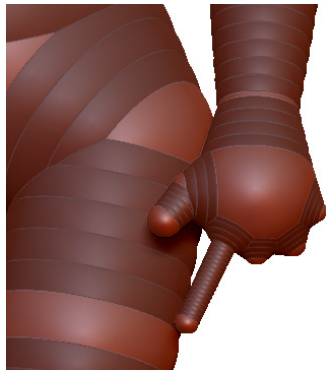


***Figure 5-70*** *Thumb and index finger created by creating ZSpheres and moving them outward*

15. Create the middle finger by creating a ZSphere at the knuckle and then moving it outward. Next, insert a ZSphere at the middle of the index finger and the middle finger by clicking on the linked spheres, as shown in Figure 5-71.

16. Similarly, create the ring finger and little finger and adjust them by scaling and moving the ZSpheres in them, refer to Figure 5-72.

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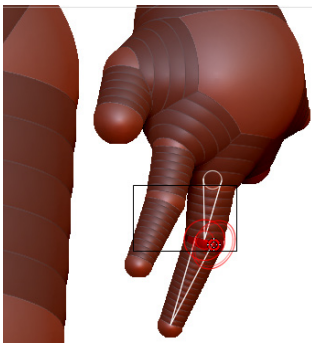


***Figure 5-71*** *Two new ZSpheres inserted in the index finger and the middle finger*

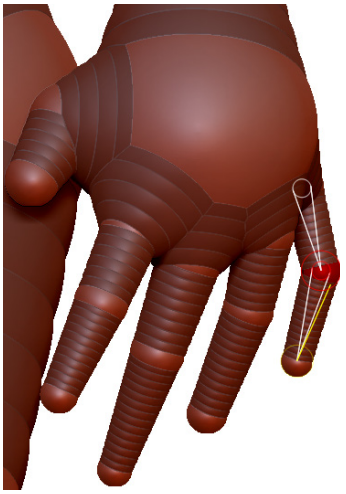


***Figure 5-72*** *Ring finger and the little finger created using ZSpheres*

## Creating the Neck and the Head

In this section, you will create the neck and head of the human body by creating new ZSpheres on the existing structure.

1. Choose the **Move** button from the top shelf. Hover the cursor on the top-most ZSphere of the framework and place it at the middle of the area that divides the red and maroon tones of the ZSphere. Next, choose the **Draw** button, and create a ZSphere for the lower part of the neck, refer to Figure 5-73.

2. Create another ZSphere for the upper part of the neck, refer to Figure 5-74.

3. Create a ZSphere on the top of the neck for the lower part of the head, refer to Figure 5-75.

4. Similarly, create another ZSphere for the upper part of the head, refer to Figure 5-76.

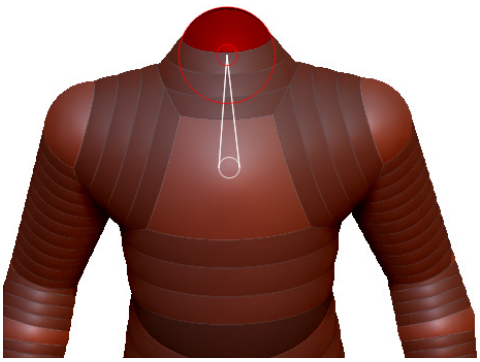


***Figure 5-73*** *ZSphere created for the lower part of the neck*

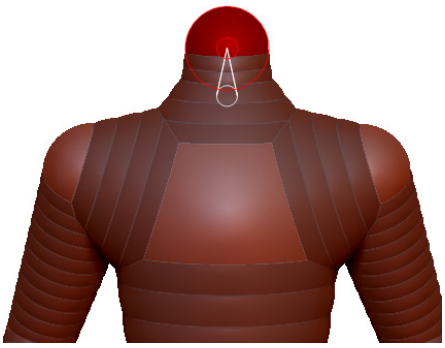


***Figure 5-74*** *Second ZSphere created for the upper part of the neck*

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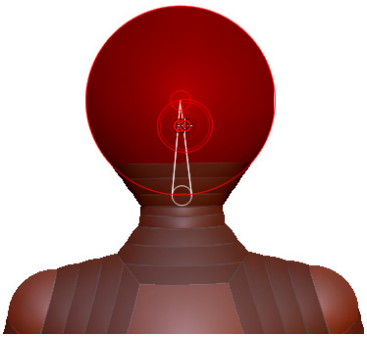


***Figure 5-75*** *ZSphere created for the lower part of the head*

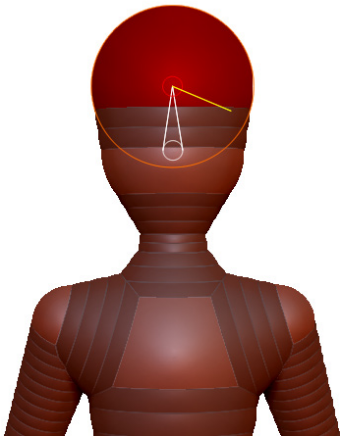


***Figure 5-76*** *ZSphere created for the upper part of the head*

If required, scale and move the ZSpheres in the structure to adjust the anatomy of the model, refer to Figure 5-77. You can view the skinned preview of the model by pressing the A key, refer to Figure 5-78.

## Saving the Model

In this section, you will save the file using the steps given next.

1. Choose the **Save As** button from the **Tool** palette; the **Save ZTool** dialog box is displayed. In this dialog box, browse to the location *\Documents\ZBrushprojects\c05*.

2. Enter **c05tut1** in the **File name** edit box and then choose the **Save** button.



***Figure 5-77*** *Final model of the body*



***Figure 5-78*** *Skinned preview of the body*

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## Tutorial 2

In this tutorial, you will create the basic shape of the head of stag deer using ZSpheres. The final output of the model is shown in Figure 5-79. **(Expected time: 30 min)**

The following steps are required to complete this tutorial:

a. Create the head and neck of the stag deer.
b. Create the antlers of the stag deer.
c. Save the model.

### Creating the Head and Neck of the Stag Deer

In this section, you will create the head and neck of the stag deer using a framework of ZSpheres.

1. Choose the Current Tool button from the **Tool** palette; a flyout is displayed. In this flyout, choose the **ZSphere** primitive and create it on the canvas, as shown in Figure 5-80. Next, choose the **Edit** button from the top shelf. Activate the symmetry in the X-axis by pressing the X key.



***Figure 5-79*** *Basic shape of the head of stag deer*

2. Hover the cursor at the area that divides the red and maroon tones of the ZSphere and create a ZSphere at the center, as shown in Figure 5-81.

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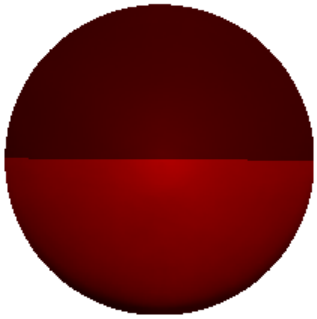


***Figure 5-80*** *ZSphere created in the canvas*

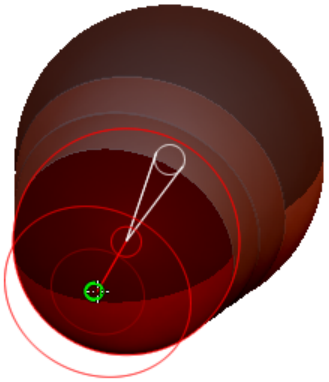


***Figure 5-81*** *ZSphere created at the center*

3. Create another ZSphere at the center of ZSphere created in Step 2, refer to Figure 5-82.

4. Choose the **Scale** button from the top shelf. Next, select the newly created ZSphere by clicking on it. Press and hold the left mouse button and drag the cursor inward to scale down the ZSphere. Now, choose the **Move** button from the top shelf and move the ZSphere slightly upward, refer to Figure 5-83.

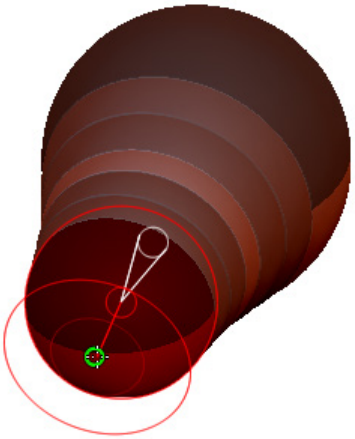


***Figure 5-82*** *Third Zsphere created*

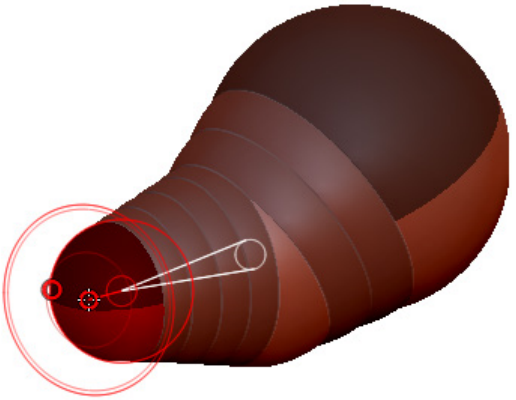


***Figure 5-83*** *ZSphere moved upward*

5. Create a new ZSphere on the topmost ZSphere to create an ear, refer to Figure 5-84. As the symmetry is activated in the X axis, a ZSphere is created on the opposite side also.

6. Create another ZSphere on the ZSphere created in Step 5, and move it upward using the **Move** button, refer to Figure 5-85.

7. Choose the **Draw** button from the top shelf and insert an editable ZSphere at the center of the ear by clicking on the linked ZSphere, refer to Figure 5-86. Next, choose the **Move** button from the top shelf, and move the newly inserted ZSphere slightly outward, as shown in Figure 5-87.

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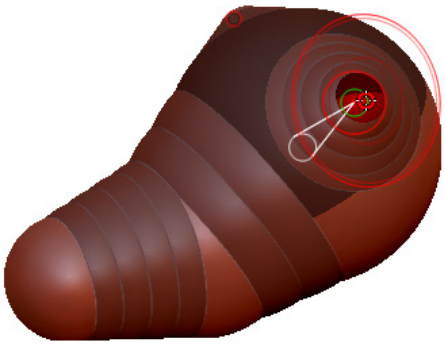


***Figure 5-84*** *ZSphere drawn for the ear*

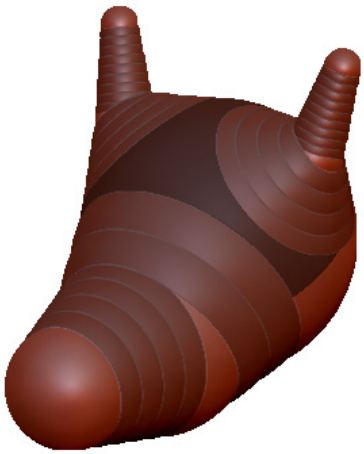


***Figure 5-85*** *ZSphere drawn and moved up*

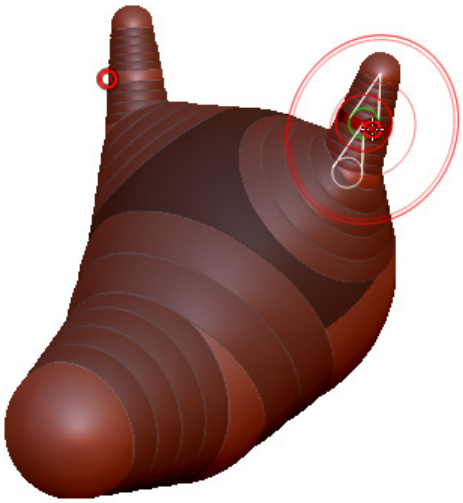


***Figure 5-86*** *ZSphere inserted at the centre*



***Figure 5-87*** *ZSphere moved outward*

8. Choose the **Draw** button from the top shelf and create a new ZSphere for the neck of the deer, refer to Figure 5-88. Next, choose the **Move** button from the top shelf and move the newly created ZSphere outward, as shown in Figure 5-89.

9. Choose the **Draw** button from the top shelf and insert an editable ZSphere in the neck by clicking on the linked ZSphere, refer to Figure 5-90. Next, choose the **Scale** button from the top shelf, and scale down the inserted ZSphere, as shown in Figure 5-90.

10. Select the bottom ZSphere of the neck and scale it up to form the shape of the neck, refer to Figure 5-91.

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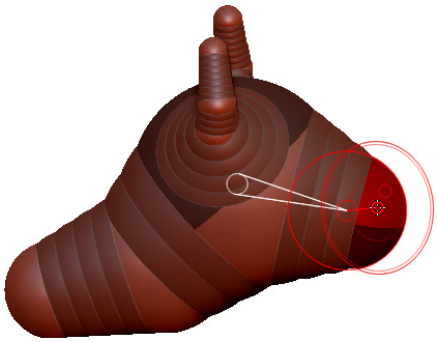


***Figure 5-88*** *ZSphere created for the neck*

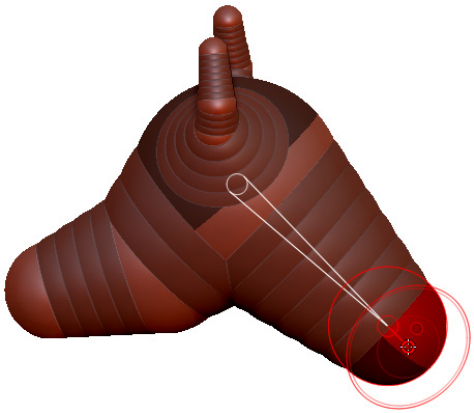


***Figure 5-89*** *ZSphere moved outward*

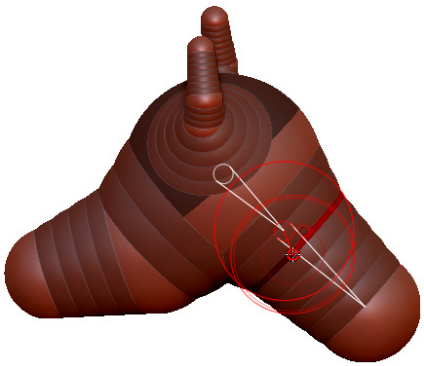


***Figure 5-90*** *ZSphere inserted in the neck and scaled down*

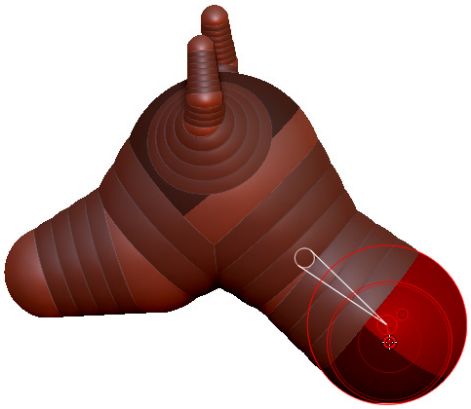


***Figure 5-91*** *ZSphere scaled up*

## Creating the Antlers of the Stag Deer

In this section, you will create the antlers of the stag deer using ZSpheres.

1. Choose the **Draw** button from the top shelf and create a ZSphere on the head to form the base for the antler, refer to Figure 5-92.

2. Create a new ZSphere on the ZSphere created in Step 1. Next, choose the **Move** button and then move the newly created ZSphere up, refer to Figure 5-93.

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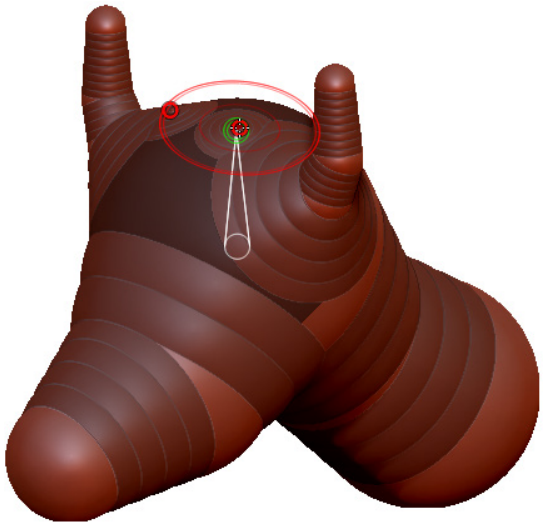


***Figure 5-92*** *ZSphere created for the antler*

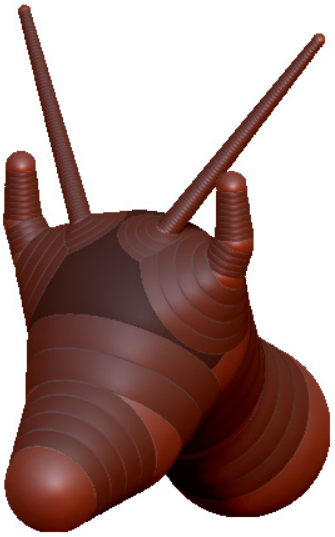


***Figure 5-93*** *ZSphere created and moved up*

3. Choose the **Draw** button from the top shelf and insert new ZSpheres on the linked sphere. Choose the **Move** button and move the inserted ZSpheres to form the structure, as shown in Figure 5-94.

4. Continue inserting more ZSpheres. Move and scale the inserted ZSpheres to create the structure of the antlers, as shown in Figure 5-95.



***Figure 5-94*** *New ZSpheres created and moved*



***Figure 5-95*** *Antlers of the deer created*

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## Saving the Model

In this section, you will save the file using the steps given next.

1. Choose the **Save As** button from the **Tool** palette; the **Save ZTool** dialog box is displayed. In this dialog box, browse to the location: *\Documents\ZBrush\projects\c05*.

2. Enter **c05tut2** in the **File name** edit box and then choose the **Save** button.

## 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 sliders is used to increase or decrease the number of spans in the skinned mesh?

   (a) **Density** (b) **Proximity**
   (c) **G Radial** (d) **Max Twist**

2. Which of the following buttons is used to switch from the normal draw mode to the ZSketch mode?

   (a) **EditSketch** (b) **ShowSketch**
   (c) **Preview** (d) **Make Unified Skin**

3. The _____ brush is used to bulge out the surface of the strips of the linked spheres.

4. _____ is the process of adding bones and joints to an object.

5. The _____ brush is used to sketch the strips of ZSpheres on the canvas area.

6. The **Max Twist** slider is used to maintain the flow of geometry between the parent ZSphere and the intersecting ZSpheres that are created on its surface. (T/F)

7. On creating a ZSphere, the **Smooth 1** brush is displayed by default. (T/F)

8. The **SoftBind** slider is used to specify the level of binding between the underlying framework and sketched ZSpheres. (T/F)

9. The **Optimize** button is used to delete the unnecessary ZSpheres in the strips of ZSpheres that are not visible in the canvas. (T/F)

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## Review Questions

**Answer the following questions:**

1. Which of the following keys is used to view the skinned mesh in the canvas?

   (a) S (b) M
   (c) A (d) V

2. Which of the following hotkeys is used to switch from the normal draw mode to the ZSketch mode?

   (a) SHIFT+Z (b) SHIFT+D
   (c) CTRL+SHIFT+Z (d) SHIFT+A

3. In which of the following subpalettes is the **Bind Mesh** button located?

   (a) **ZSketch** (b) **Rigging**
   (c) **Adaptive Skin** (d) **Unified Skin**

4. ZSpheres are most commonly used in _____ modeling.

5. _____ skinning is used to convert a ZSphere framework into a polygon mesh in such a way that the polymesh consists of a large number of polygons that are equal in size.

6. The _____ button is used to switch to the classic skinning technique that was available in the ZBrush 3 version.

7. The term **Min Dist** stands for _____.

8. If you want to delete a ZSphere, press and hold the SHIFT key and then click on the ZSphere that you want to delete. (T/F)

9. If the value set in the **Density** slider is higher, the skinned mesh will contain more number of polygons and will be smoother. (T/F)

# EXERCISES

The output of the models used in the following exercises can be accessed by downloading the *c05_ZBrush_2021_exr.zip* file from *www.cadcim.com*. The path of the file is as follows: *Textbooks > Animation and Visual Effects > ZBrush > ZBrush 2021: A Comprehensive Guide*.

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## Exercise 1

Create the model of a tree using ZSpheres, as shown in Figure 5-96.

**(Expected time: 30 min)**



***Figure 5-96*** *Model of a tree*

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## Exercise 2

Create the scene shown in Figure 5-97 using ZSpheres and different subtools.

**(Expected time: 30 min)**



***Figure 5-97*** *Scene to be created for Exercise 2*

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**Answers to Self-Evaluation Test**

**1.** c, **2.** a, **3. Bulge**, **4.** Rigging, **5. Armature**, **6.** F, **7.** F, **8.** T, **9.** T