

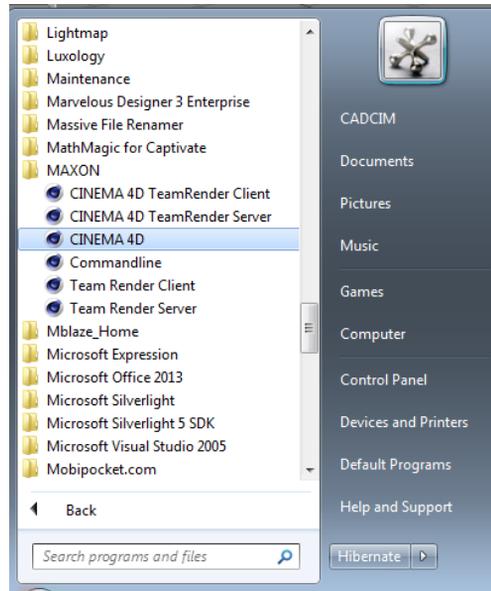
Chapter 1

Exploring CINEMA 4D R19 Studio Interface

Learning Objectives

After completing this chapter, you will be able to:

- *Work with Viewport Navigation Tools in CINEMA 4D*
- *Understand various terms related to CINEMA 4D interface*
- *Work with tools in CINEMA 4D*



*Figure 1-1 Starting MAXON CINEMA 4D R19 Studio from the **Start** menu*

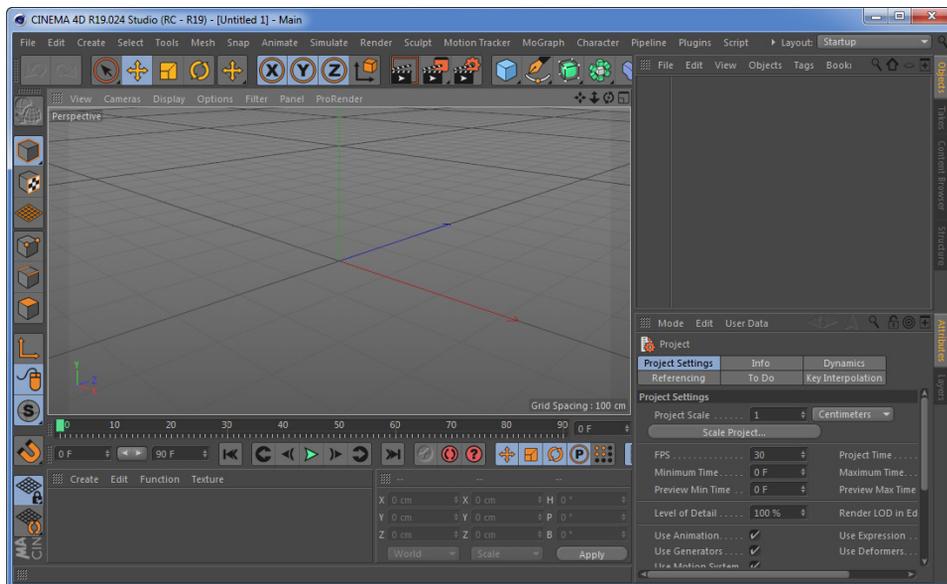


Figure 1-2 The default interface of CINEMA 4D R19 Studio

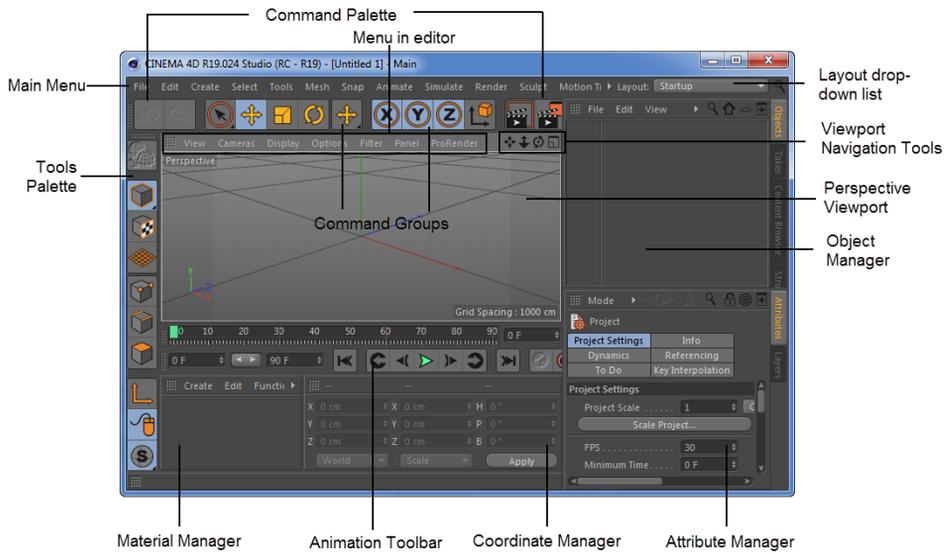


Figure 1-3 Various components of CINEMA 4D R19 Studio interface

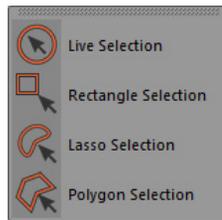


Figure 1-4 The flyout displayed

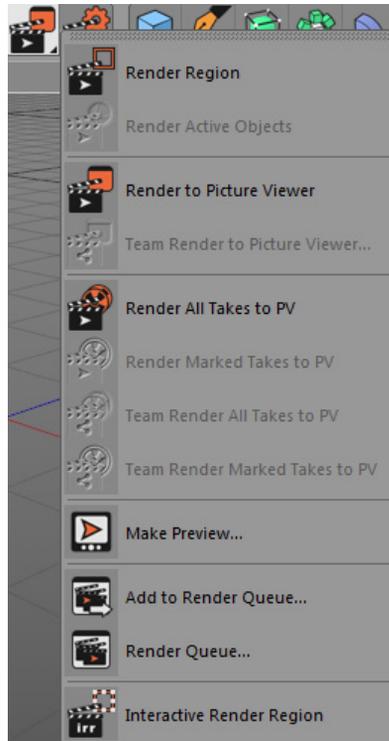


Figure 1-5 The rendering options displayed in the flyout

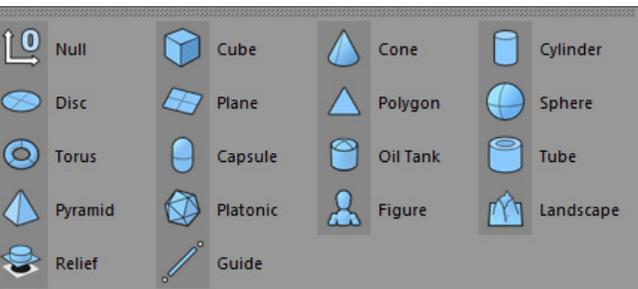


Figure 1-6 The tools to create the parametric objects displayed in flyout

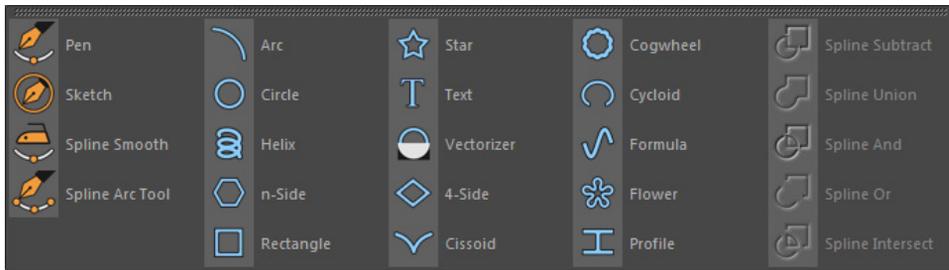


Figure 1-7 The spline modeling tools displayed in the flyout

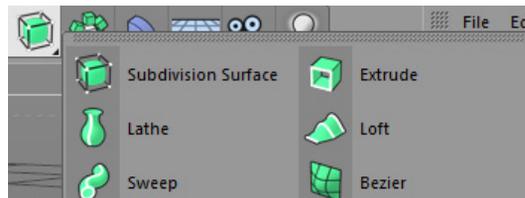


Figure 1-8 The generators displayed in the flyout

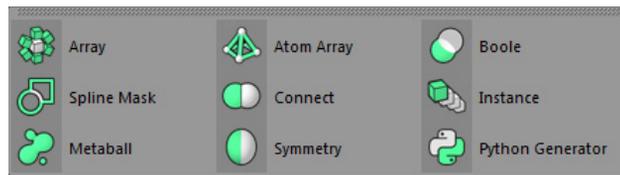


Figure 1-9 The special modeling tools displayed in the flyout

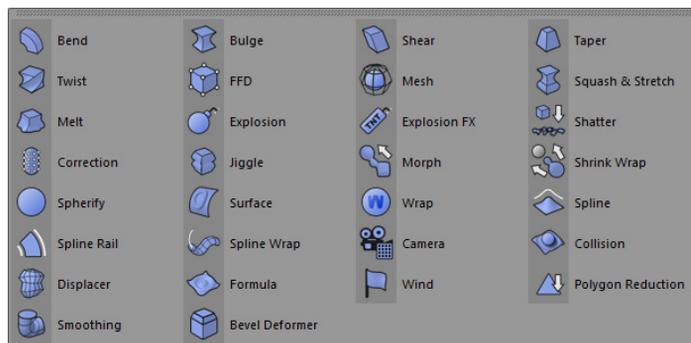


Figure 1-10 Various deforming tools displayed in the flyout

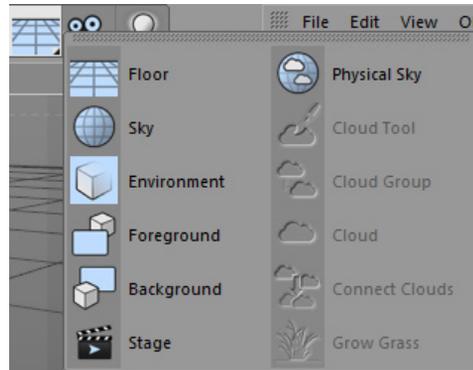


Figure 1-11 Various tools displayed in the flyout

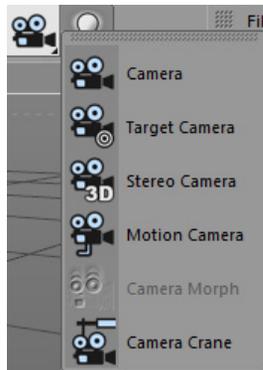


Figure 1-12 Various camera tools displayed in the flyout

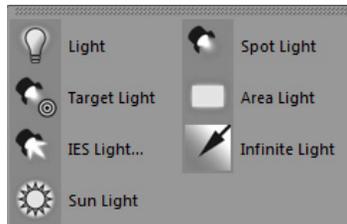


Figure 1-13 Various light tools displayed in the flyout

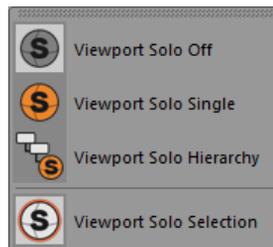


Figure 1-14 Various options displayed in the flyout

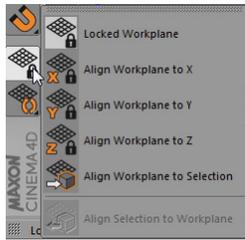


Figure 1-15 Flyout displayed on choosing the **Locked Workplane** tool

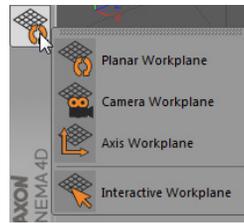


Figure 1-16 Flyout displayed on choosing the **Planar Workplane** tool

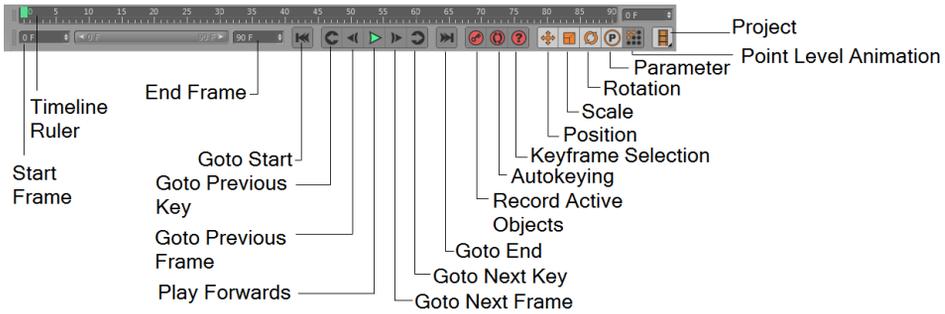


Figure 1-17 The Animation toolbar

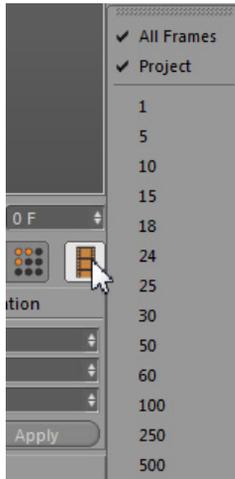


Figure 1-18 The flyout displayed on choosing the **Project** button

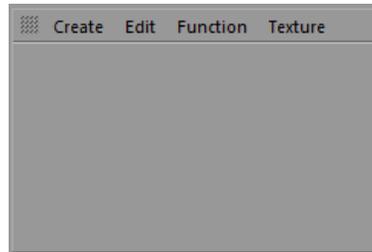


Figure 1-19 The Material Manager

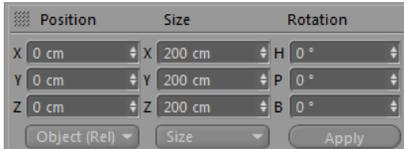


Figure 1-20 The Coordinate Manager



Figure 1-21 The Object Manager

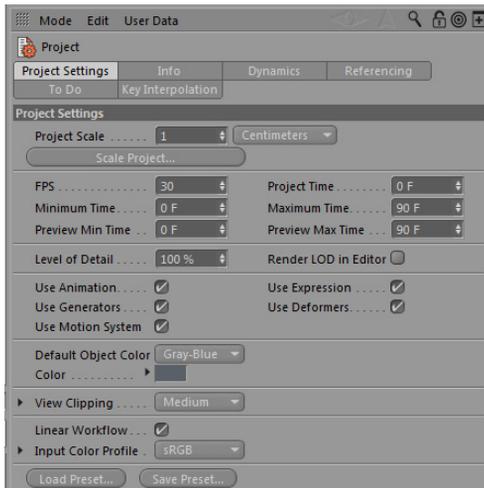


Figure 1-22 The Attribute Manager

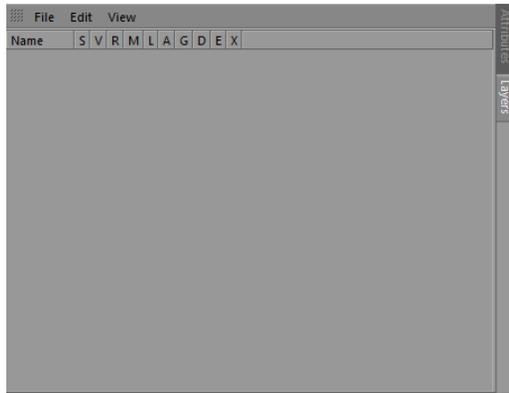


Figure 1-23 The Layers Manager

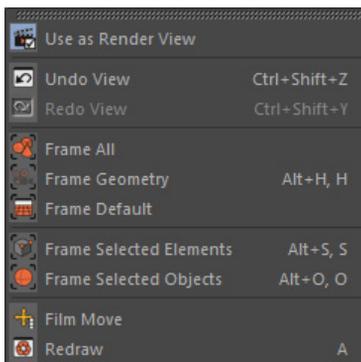


Figure 1-24 The flyout displayed on choosing the View menu

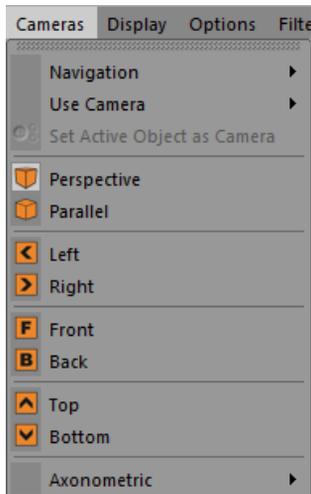


Figure 1-25 The flyout displayed on choosing the **Cameras** menu

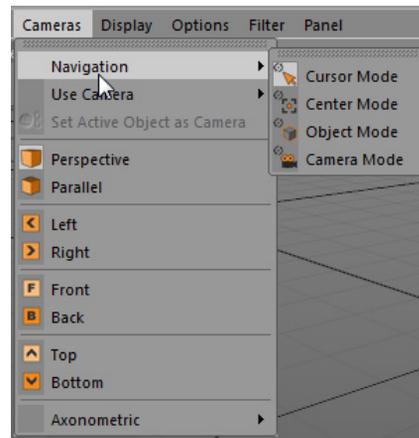


Figure 1-26 The cascading menu displayed on choosing the **Navigation** option from the **Cameras** menu

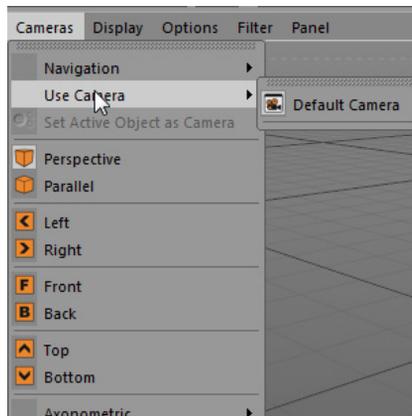


Figure 1-27 The cascading menu displayed on choosing the **Use Camera** option

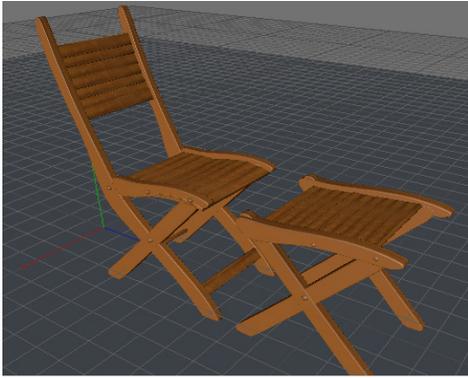


Figure 1-28 The perspective camera projection mode



Figure 1-29 The parallel camera projection mode

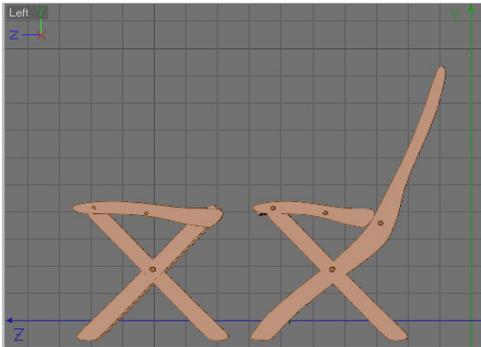


Figure 1-30 The left camera projection

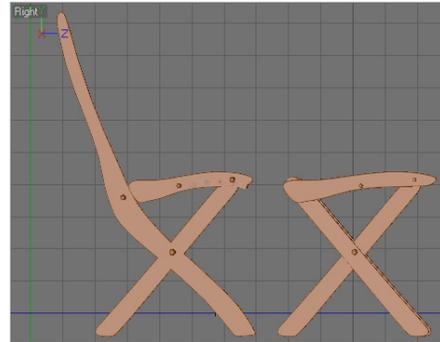


Figure 1-31 The right camera projection

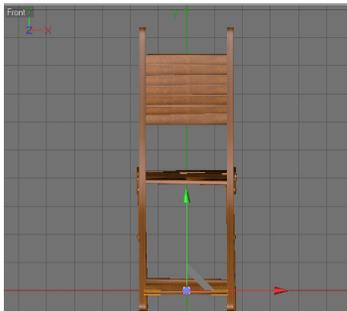


Figure 1-32 The front camera projection

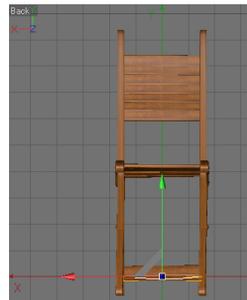


Figure 1-33 The back camera projection



Figure 1-34 The top camera projection

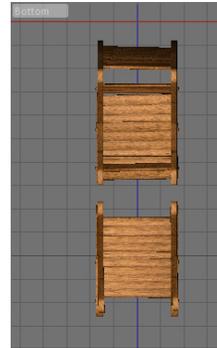


Figure 1-35 The bottom camera projection

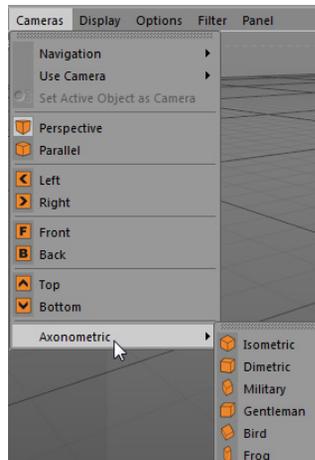


Figure 1-36 The cascading menu displayed on choosing the **Axonometric** option from the **Cameras** menu

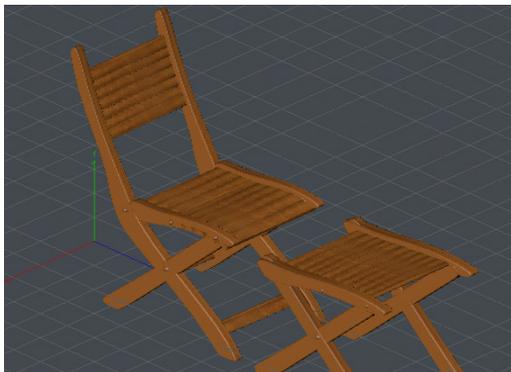


Figure 1-37 The isometric camera projection



Figure 1-38 The dimetric camera projection



Figure 1-39 The military camera projection



Figure 1-40 The gentleman camera projection



Figure 1-41 The bird camera projection

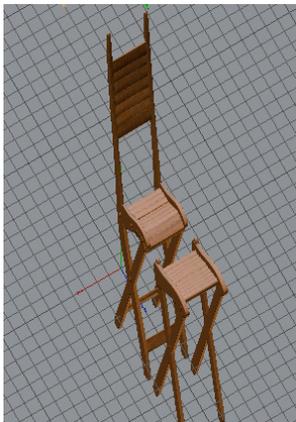


Figure 1-42 The frog camera projection

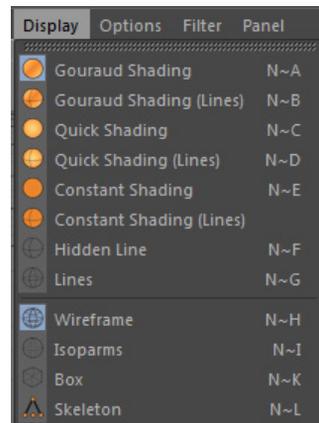


Figure 1-43 The flyout displayed on choosing the Display menu

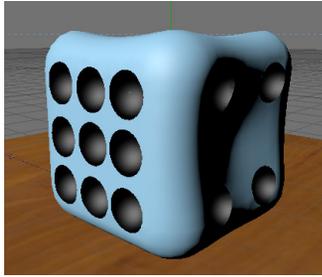


Figure 1-44 The object displayed in the viewport on choosing the **Gouraud Shading** option

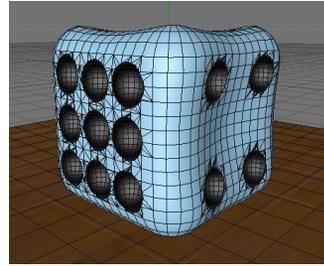


Figure 1-45 The object displayed in the viewport on choosing the **Gouraud Shading (Lines)** option

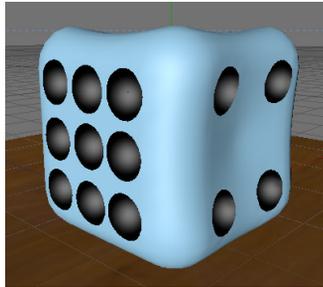


Figure 1-46 The object displayed in the viewport on choosing the **Quick Shading** option

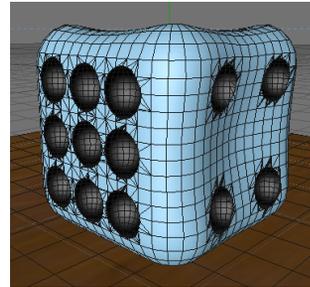


Figure 1-47 The object displayed in the viewport on choosing the **Quick Shading (Lines)** option

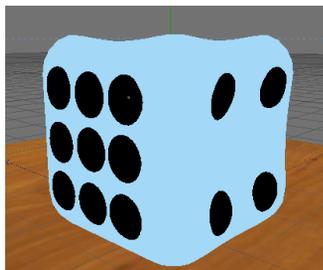


Figure 1-48 The object displayed in the viewport on choosing the **Constant Shading** option

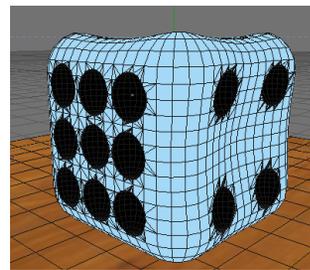


Figure 1-49 The object displayed in the viewport on choosing the **Constant Shading (Lines)** option

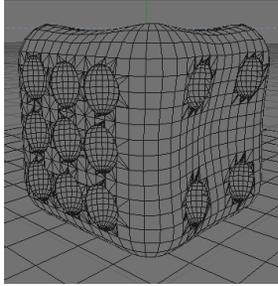


Figure 1-50 The object displayed in the viewport on choosing the **Hidden Line** option

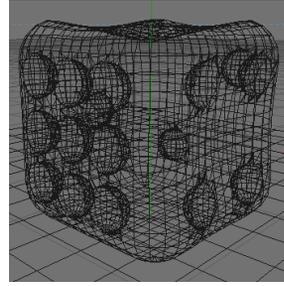


Figure 1-51 The object displayed in the viewport on choosing the **Lines** option

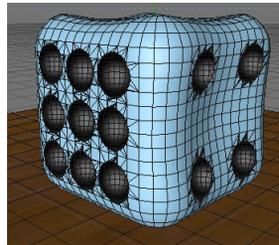


Figure 1-52 The object displayed in the **Wireframe** and **Quick Shading (Lines)** shading modes

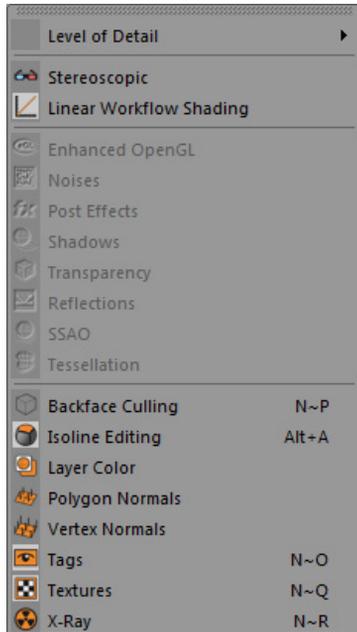


Figure 1-53 The partial view of the flyout displayed on choosing the **Options** menu



Figure 1-54 The cascading menu displayed on placing the cursor on the **Level of Detail** option

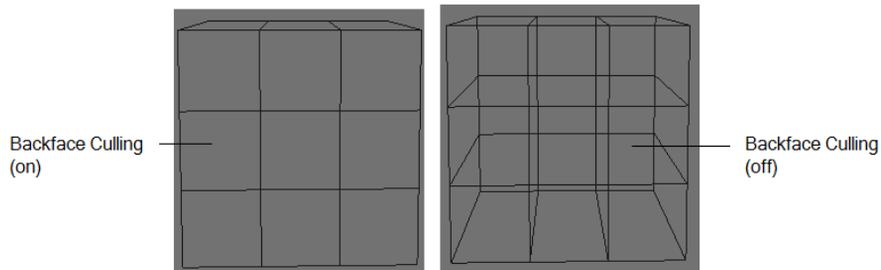


Figure 1-55 The object displayed with the **Backface Culling** option on and off

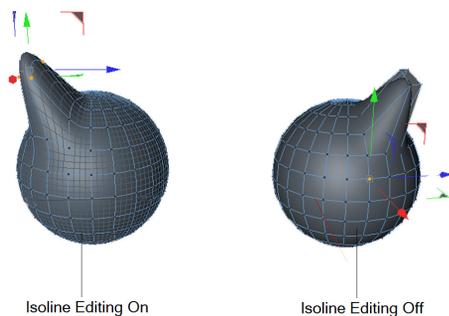


Figure 1-56 The object displayed with the **Isoline Editing** option on and off

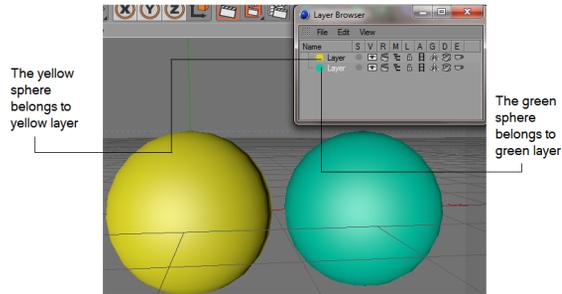


Figure 1-57 The color of the objects displayed same as the color of layers on choosing the **Layer Color** option

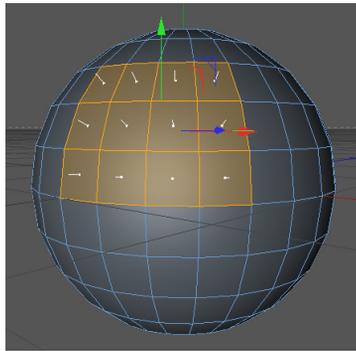


Figure 1-58 Displaying the normals of the selected polygons

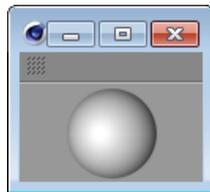


Figure 1-59 The **Default Light** window

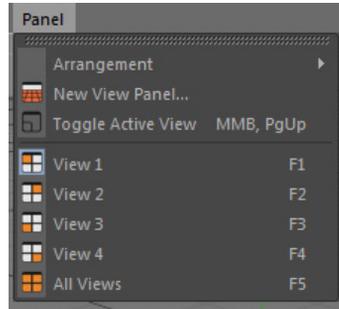


Figure 1-60 The flyout displayed on choosing the **Panel** menu

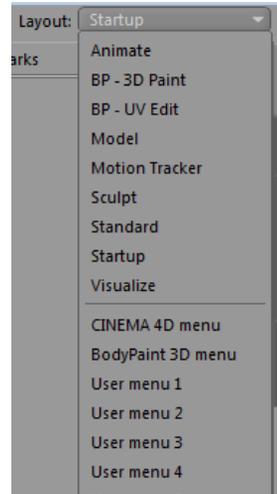


Figure 1-61 The **Layout** drop-down list

Chapter 2

Working with Splines

Learning Objectives

After completing this chapter, you will be able to:

- *Work with spline primitives*
- *Understand spline modeling techniques*
- *Create geometries using Generators*

in)



Figure 2-1 The model of door lock system

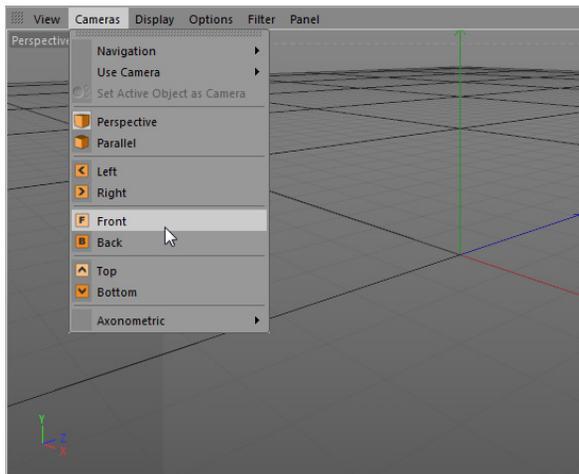


Figure 2-2 Choosing the **Front** option from the Menu in editor view

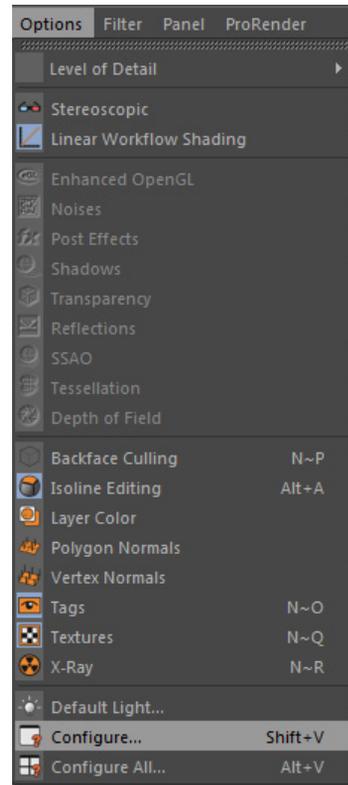


Figure 2-3 Choosing the **Configure** option from the Menu in editor view

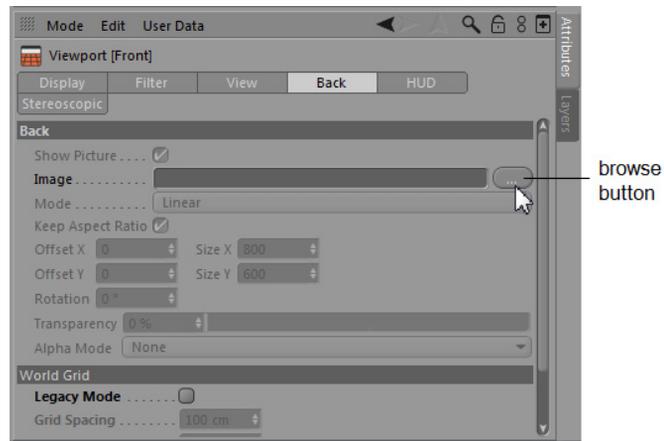


Figure 2-4 Choosing the browse button next to the Image text box

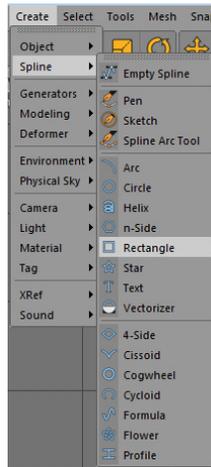


Figure 2-5 Choosing Rectangle from the Create menu

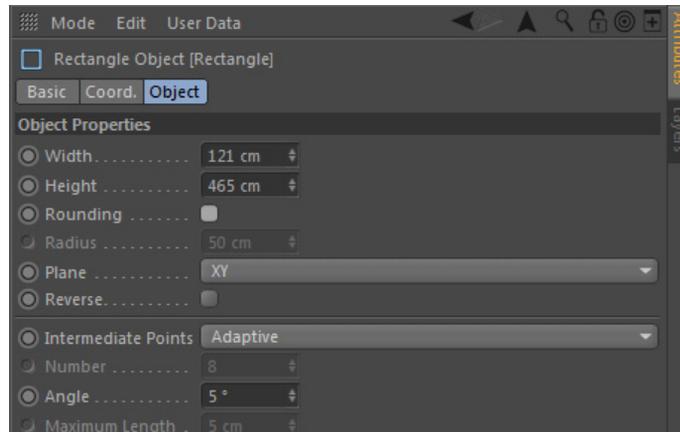


Figure 2-6 Setting the width and height of the rectangle

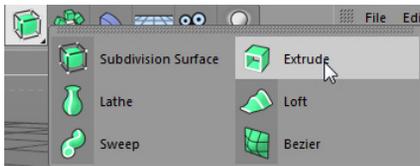


Figure 2-7 Choosing **Extrude** from the flyout

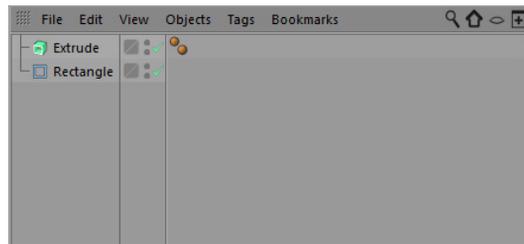


Figure 2-8 Extrude added to the Object Manager

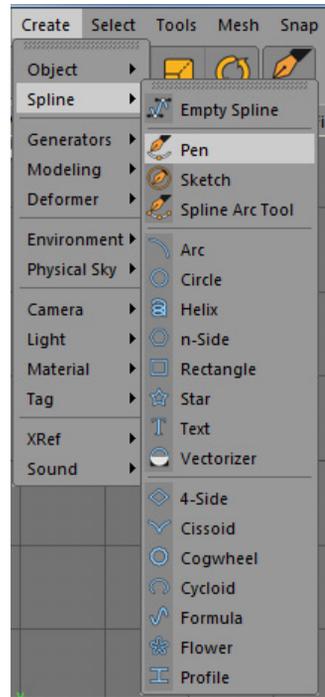
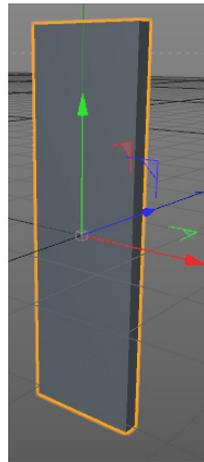


Figure 2-9 Rectangle extruded in the Perspective viewport

Figure 2-10 Choosing Pen from the main menu

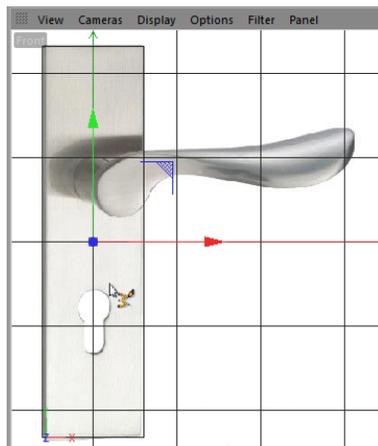


Figure 2-11 The changed shape of the cursor

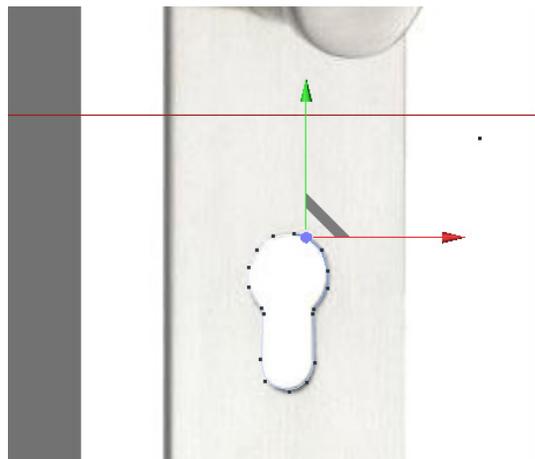


Figure 2-12 Shape of the keyhole

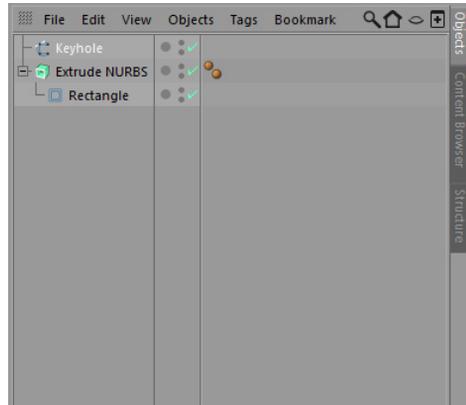


Figure 2-13 Spline renamed as keyhole

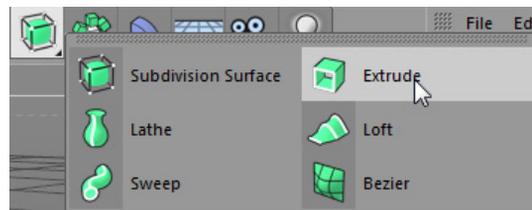


Figure 2-14 Choosing Extrude from the flyout

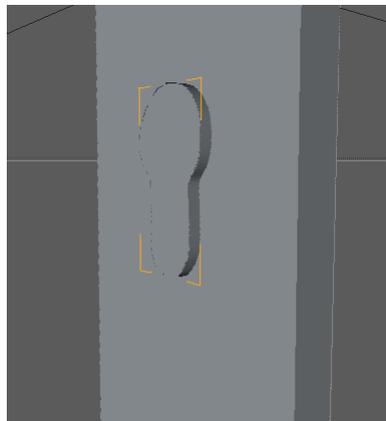


Figure 2-15 keyhole extruded in the Perspective viewport

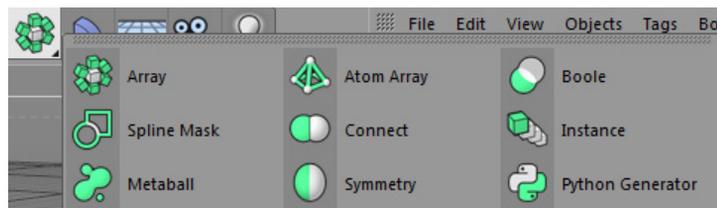


Figure 2-16 Choosing Boole from the flyout

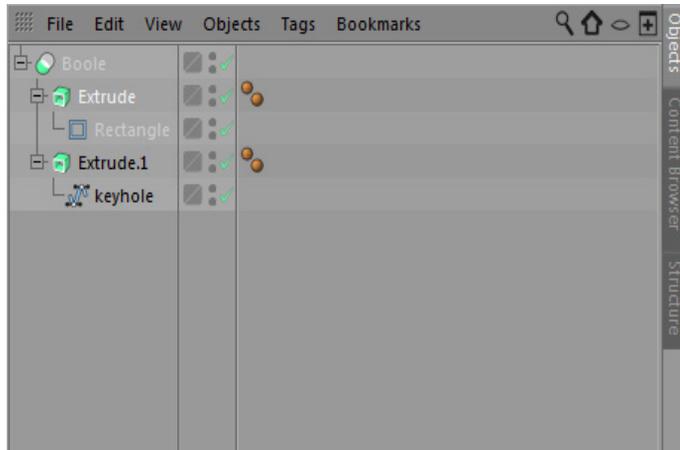


Figure 2-17 Extrude connected to Boole

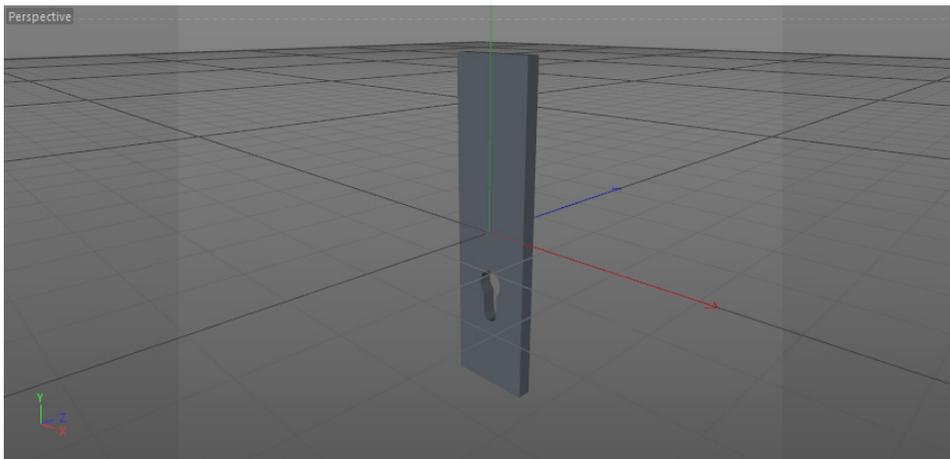


Figure 2-18 The hole created in the Perspective viewport

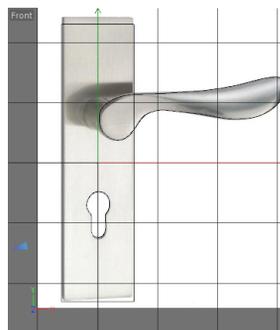


Figure 2-19 Handle placed in the front viewport

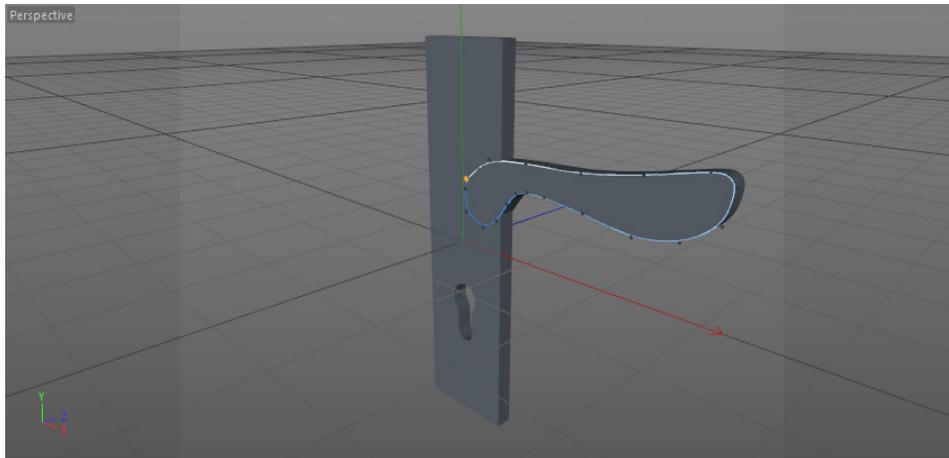


Figure 2-20 Handle extruded in the Perspective viewport

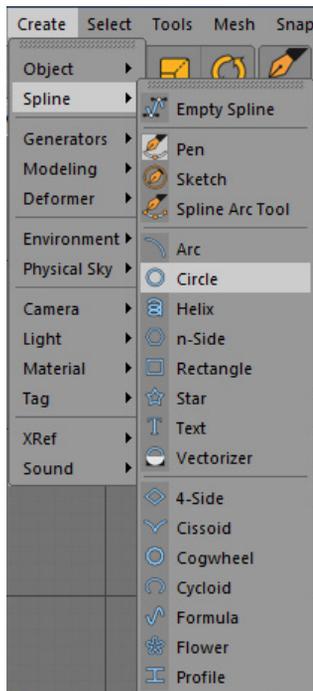


Figure 2-21 Choosing **Circle** from the main menu

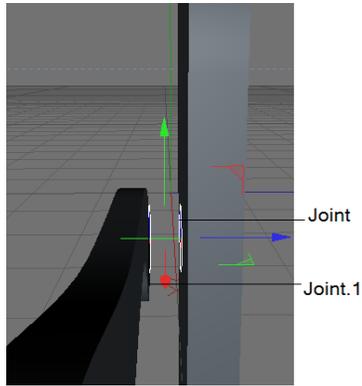


Figure 2-22 The position of Joint and Joint.1 displayed in the Perspective viewport

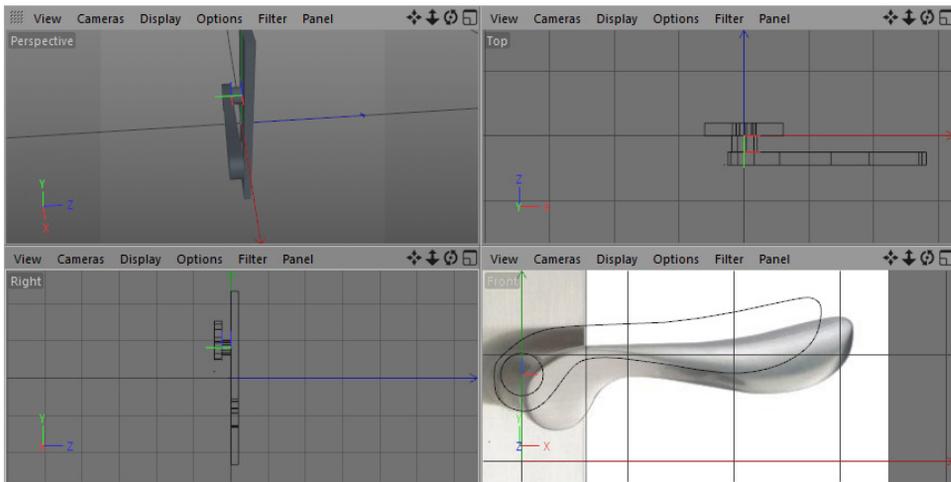


Figure 2-23 Joint and Joint.1 lofted to create a surface

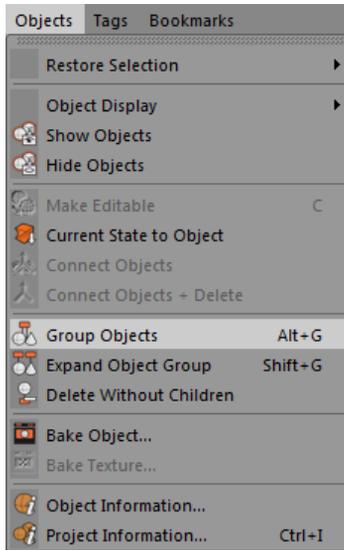


Figure 2-24 Choosing **Group Objects** from the **Objects** menu

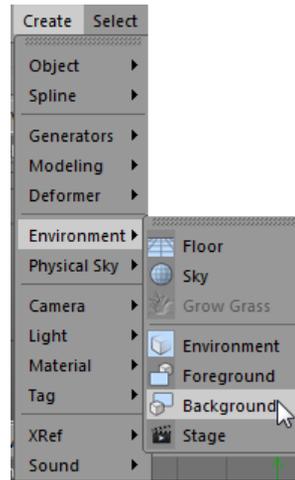


Figure 2-25 Choosing the **Background** option from the main menu



Figure 2-26 The **Background** Object selected in the Object Manager

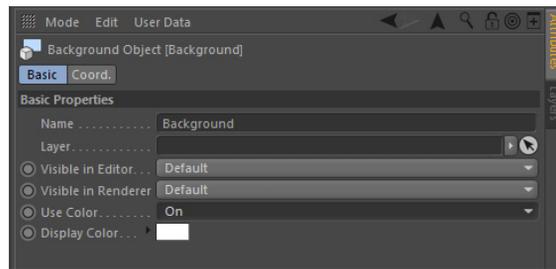


Figure 2-27 The **Display Color** parameter activated

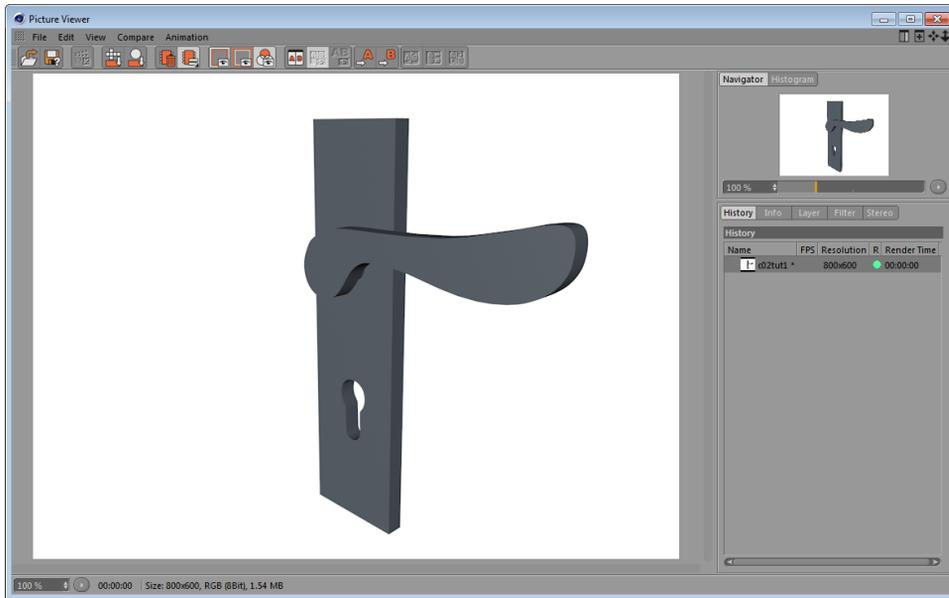


Figure 2-28 The Picture Viewer window

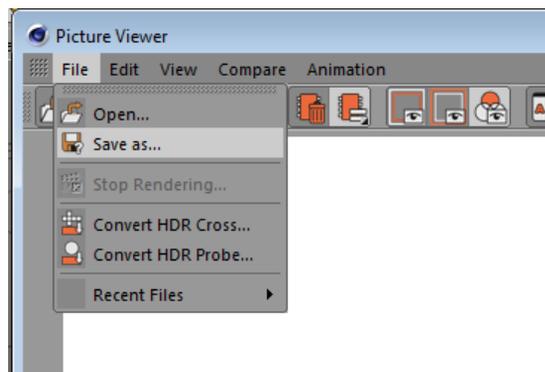


Figure 2-29 Choosing the Save as option from the File menu

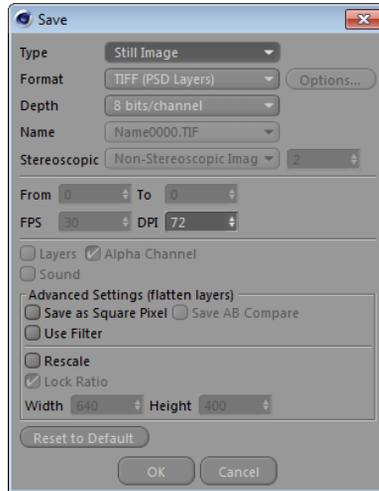


Figure 2-30 The Save dialog box

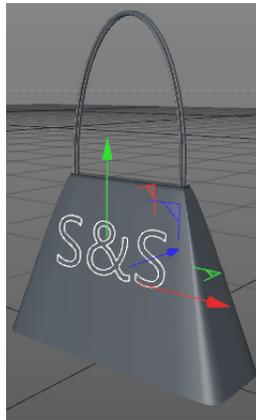


Figure 2-31 The model of a hand bag

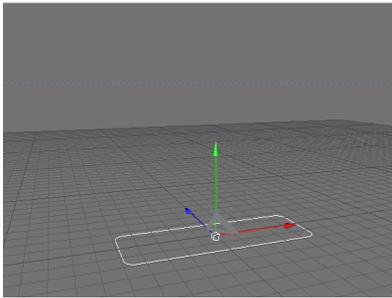


Figure 2-32 *Rectangle placed in the Perspective viewport*

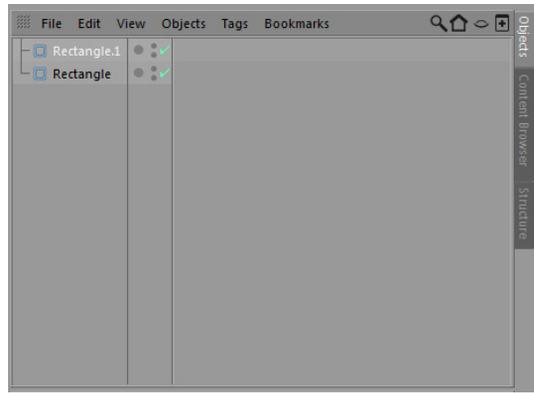


Figure 2-33 *Rectangle.1 added to the Object Manager*

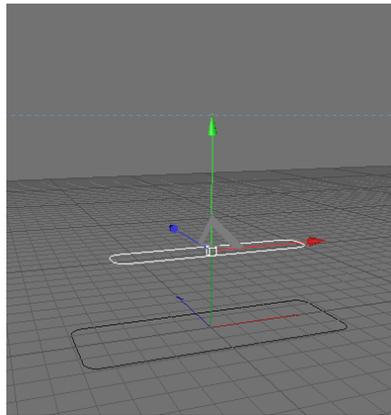


Figure 2-34 *Rectangle.1 placed in the Perspective viewport*

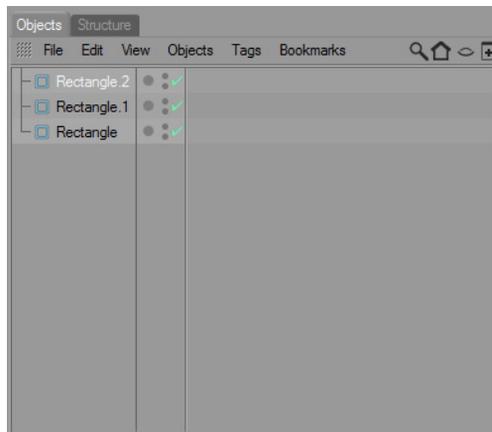


Figure 2-35 *Rectangle.2 added to the Object Manager*

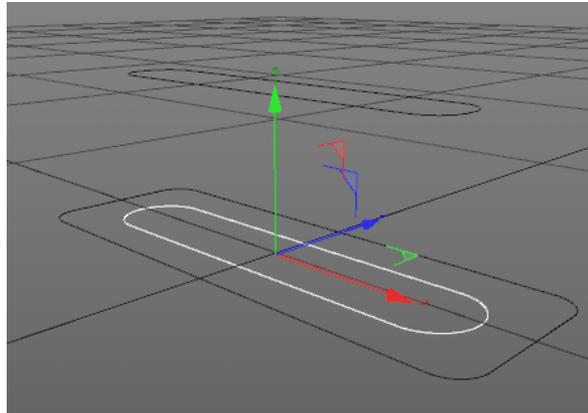


Figure 2-36 Rectangle.2 placed in the Perspective viewport

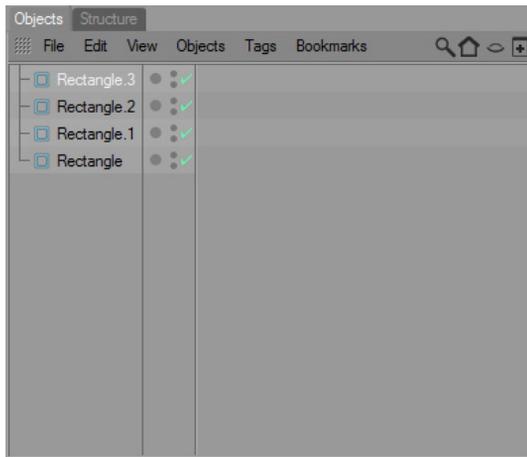


Figure 2-37 Rectangle.3 added to the Object Manager

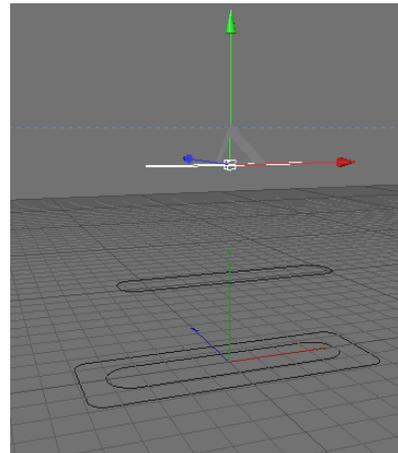


Figure 2-38 Rectangle.3 placed in the Perspective viewport

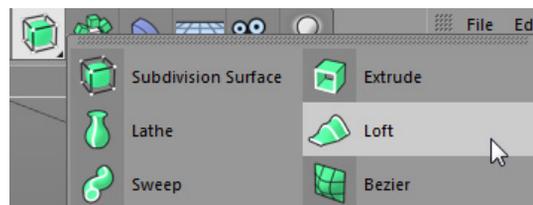


Figure 2-39 Choosing **Loft** from the flyout

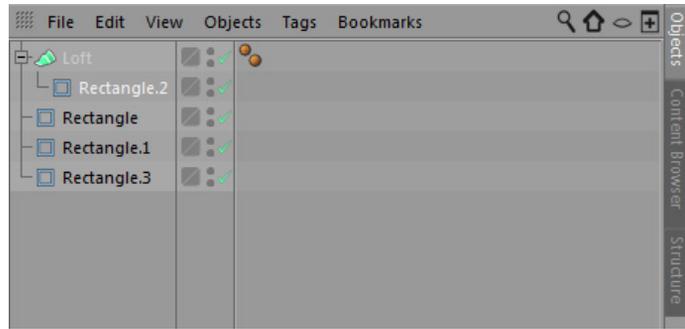


Figure 2-40 Rectangle.2 connected to Loft in the Object Manager

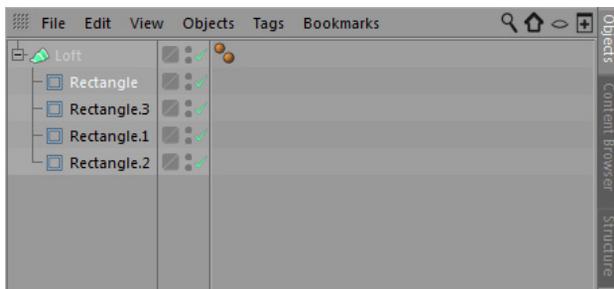


Figure 2-41 Rectangle, Rectangle.1, and Rectangle.3 connected to Loft

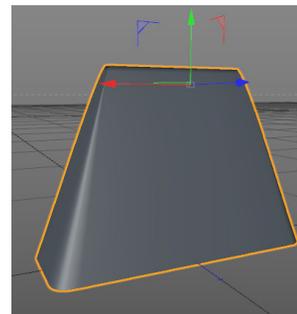


Figure 2-42 All rectangles lofted in the Perspective viewport

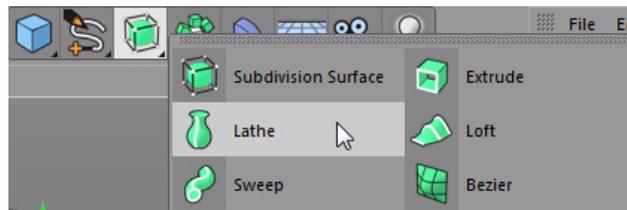


Figure 2-43 Choosing Lathe from the flyout

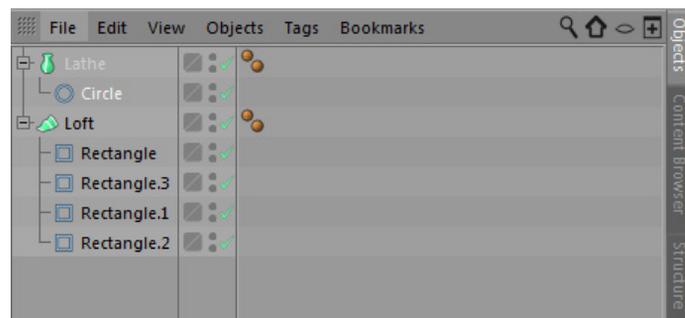


Figure 2-44 Circle connected to Lathe in the Object Manager

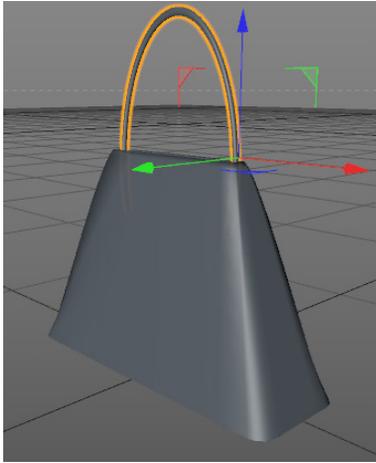


Figure 2-45 The handle of the hand bag created

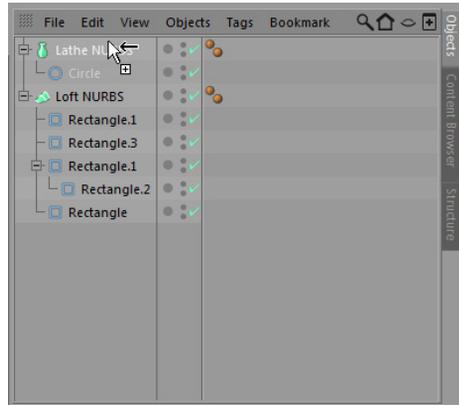


Figure 2-46 The changed shape of the cursor in the Object Manager

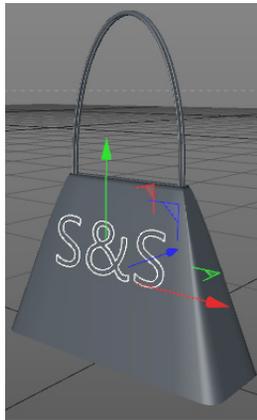


Figure 2-47 The text placed in the Perspective viewport

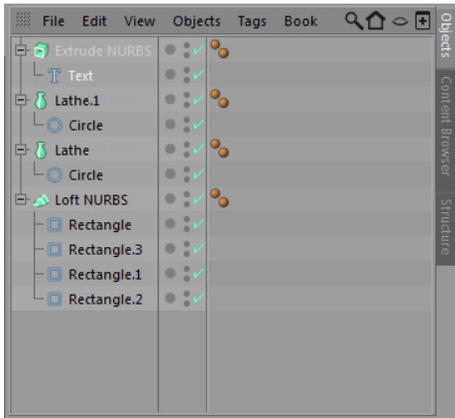


Figure 2-48 Text connected to Extrude in the Object Manager



Figure 2-49 The extruded text on the hand bag



Figure 2-50 The model of the cigar pipe



Figure 2-51 Ellipse displayed in the Front viewport



Figure 2-52 Ellipse.1 displayed in the Front viewport

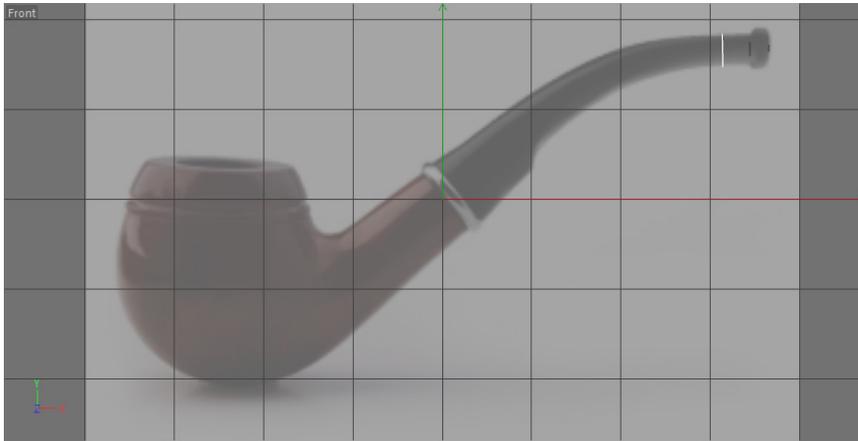


Figure 2-53 Circle displayed in the Front viewport

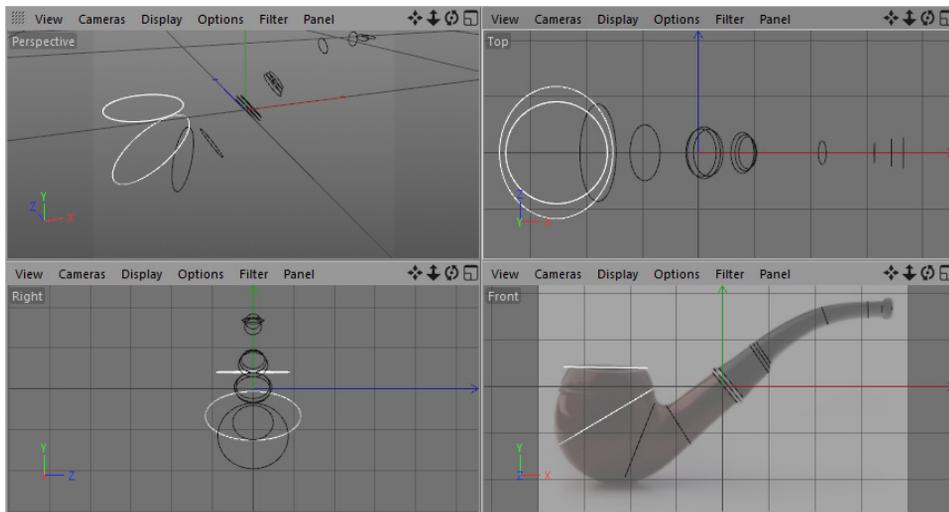


Figure 2-54 The profile of the pipe displayed

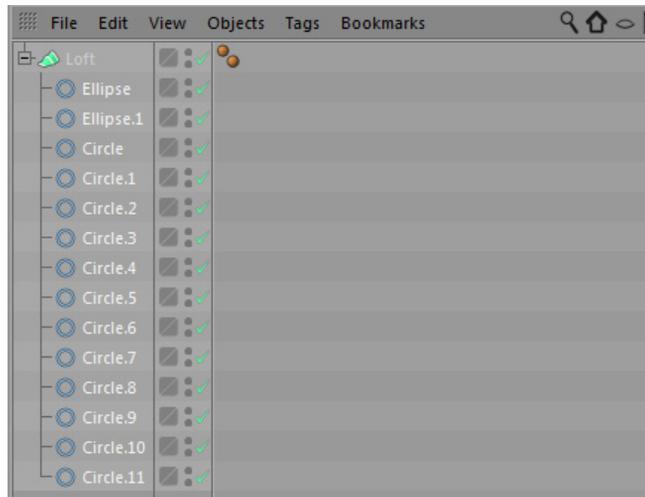


Figure 2-55 The splines connected with Loft

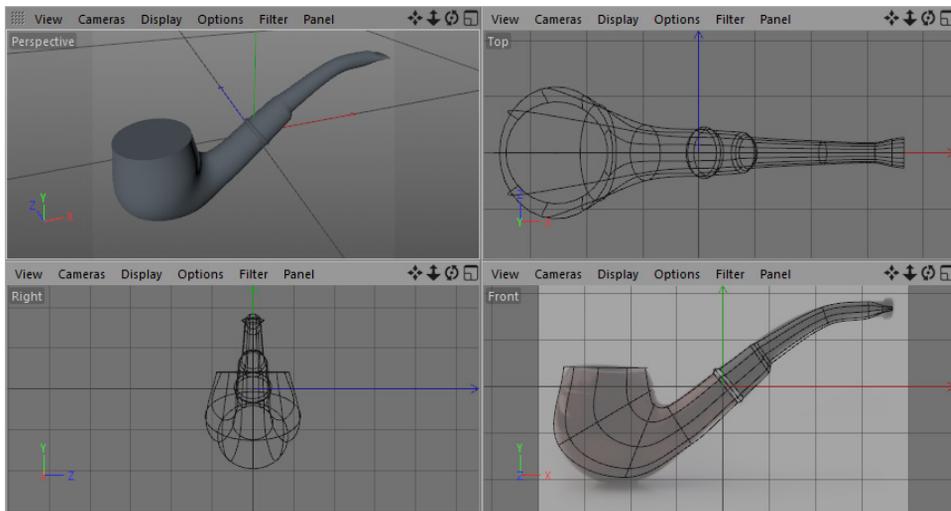


Figure 2-56 The shape of the pipe displayed

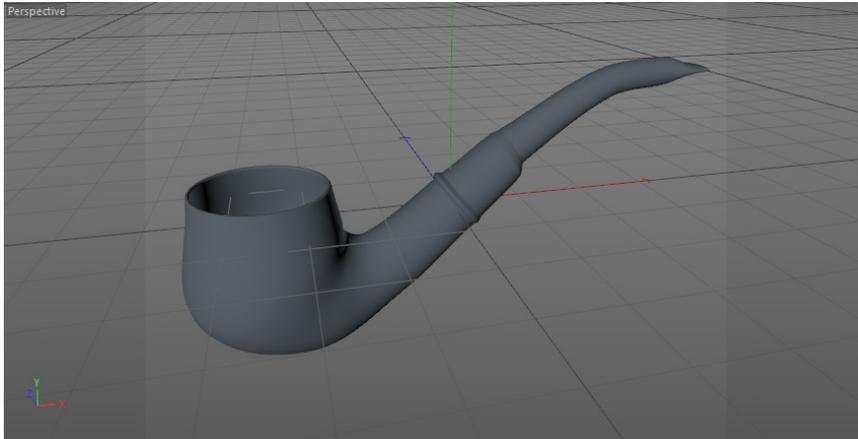


Figure 2-57 The pipe with the fillet caps displayed



Figure 2-58 The model of a chair



Figure 2-59 The model of a table clock

Chapter 3

Introduction to Polygon Modeling

Learning Objectives

After completing this chapter, you will be able to:

- *Create polygon primitives*
- *Work with various polygon modeling tools*



Figure 3-1 The model of a computer mouse

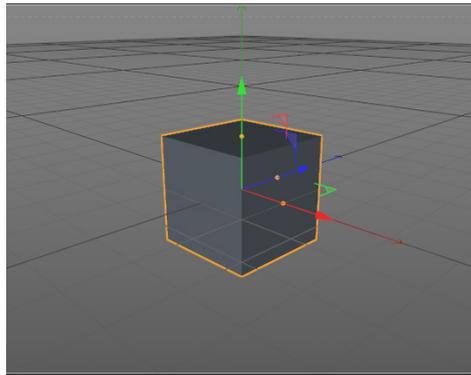


Figure 3-2 Cube created in the Perspective viewport

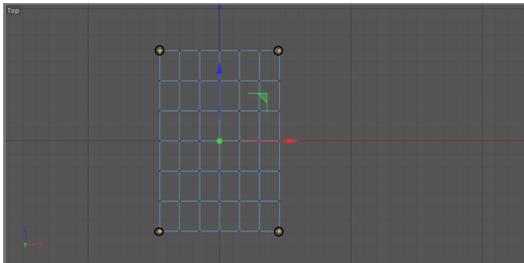


Figure 3-3 The corner points of Computer mouse to be selected

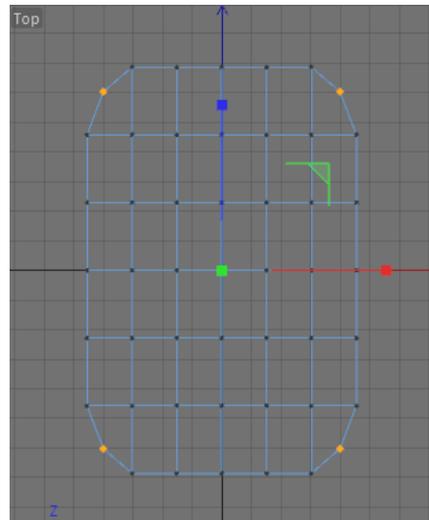


Figure 3-4 Scaling the selected points of Computer mouse

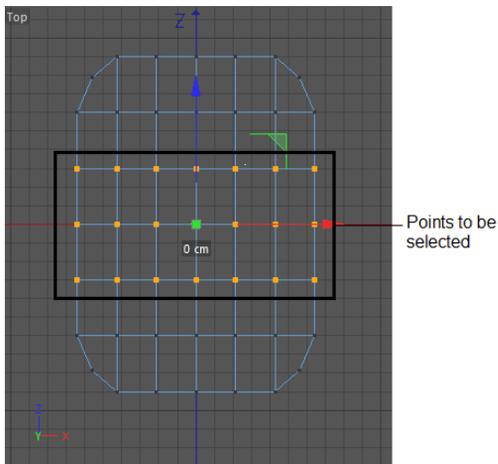


Figure 3-5 The points to be selected

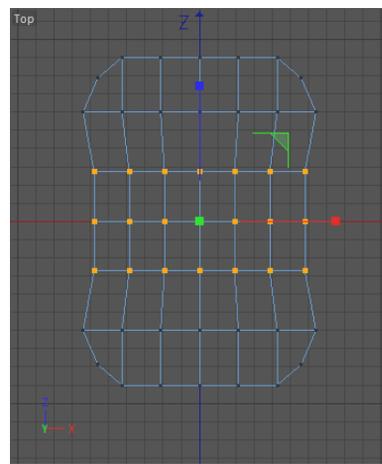


Figure 3-6 Scaling the selected points of Computer mouse

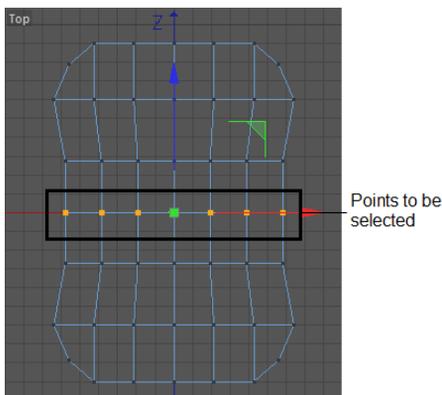


Figure 3-7 The center points to be selected

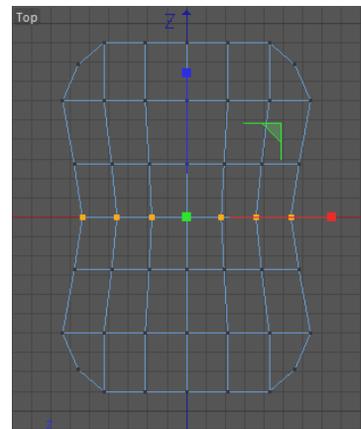


Figure 3-8 Scaling the selected points of Computer mouse

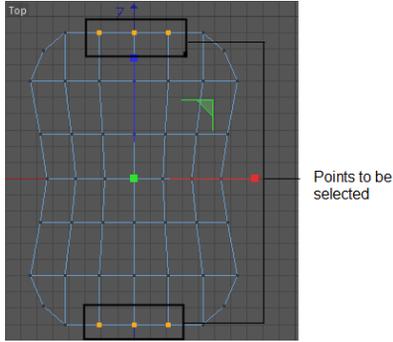


Figure 3-9 The selected points of Computer mouse

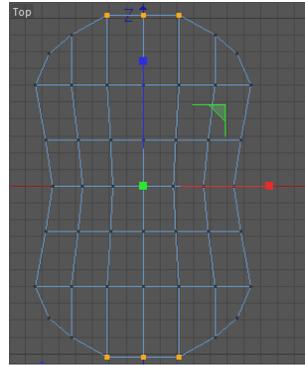


Figure 3-10 Scaling the selected points of Computer mouse

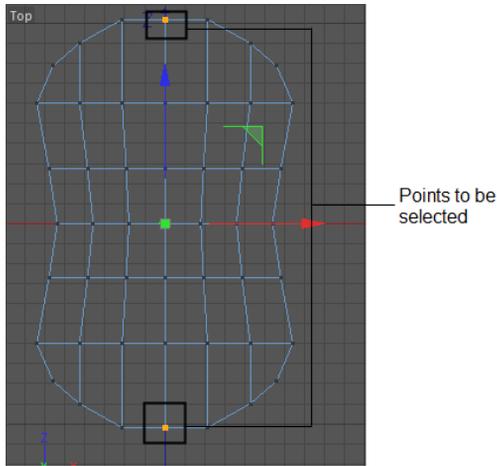


Figure 3-11 The top and bottom center points of Computer mouse selected

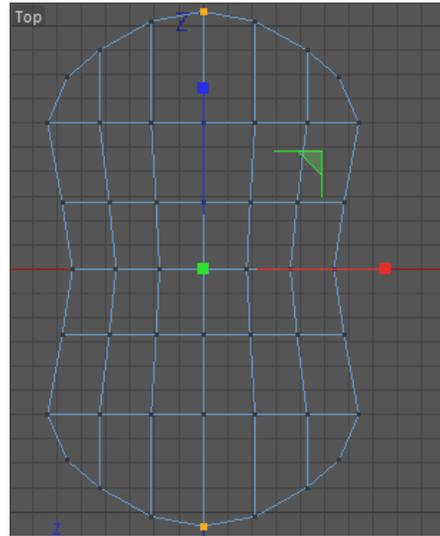


Figure 3-12 Scaling the selected points of Computer mouse

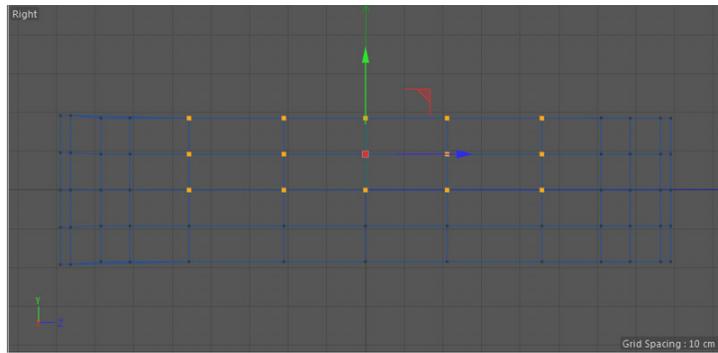


Figure 3-13 The points to be selected

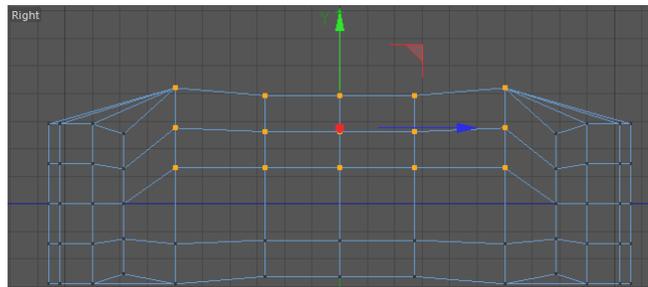


Figure 3-14 Moving the selected points of Computer mouse

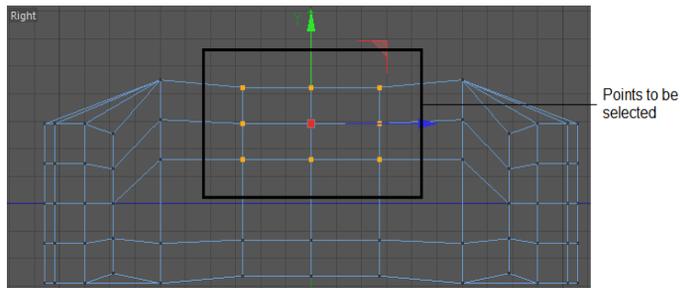


Figure 3-15 The selected points of Computer mouse

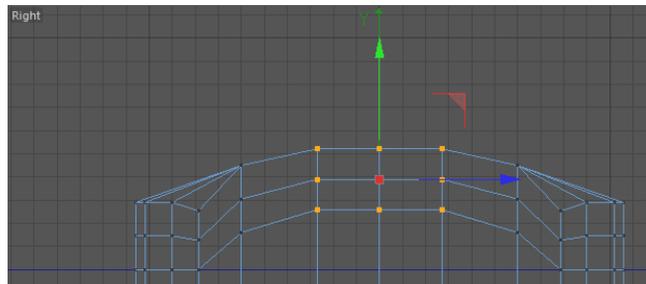


Figure 3-16 Moving the selected points of Computer mouse

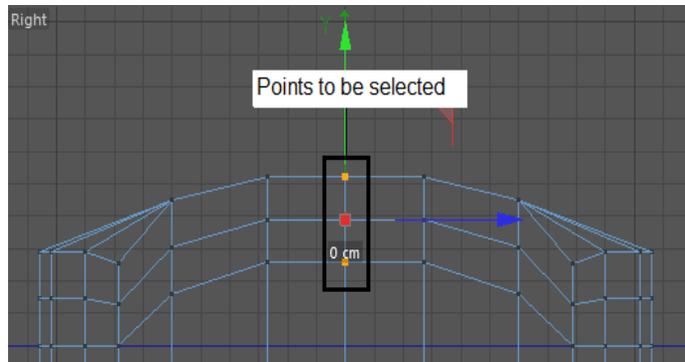


Figure 3-17 The top center points of Computer mouse selected

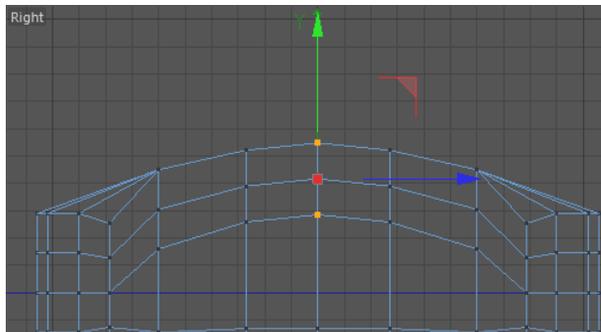


Figure 3-18 Moving the selected points of Computer mouse

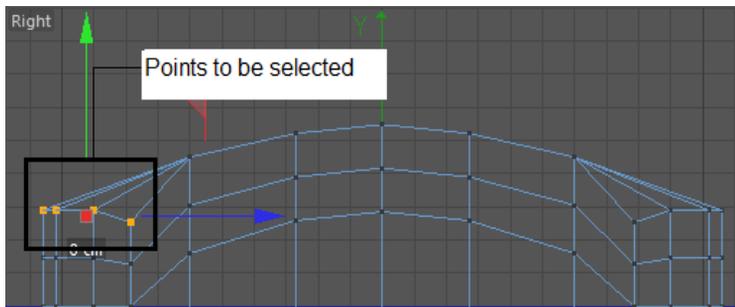


Figure 3-19 The points to be selected

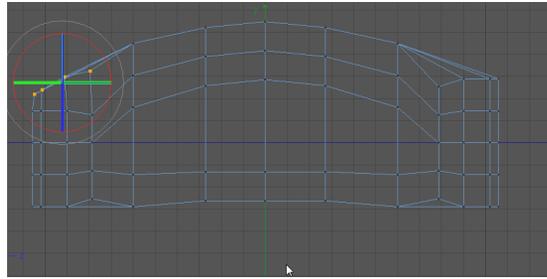


Figure 3-20 Rotating the selected points of Computer mouse

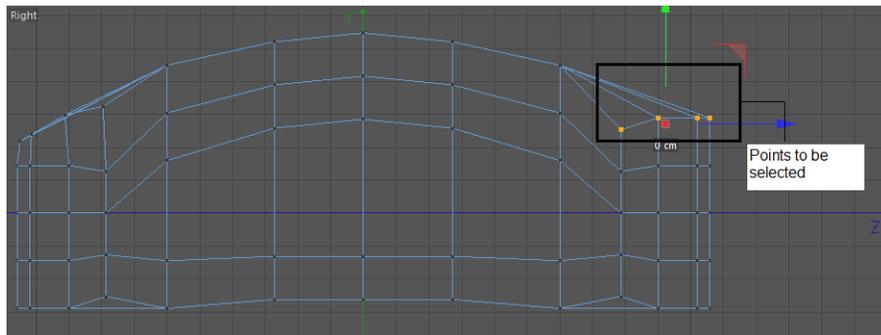


Figure 3-21 The points to be selected

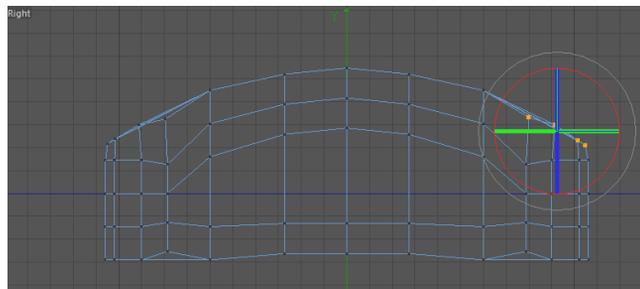


Figure 3-22 Rotating the selected points of Computer mouse

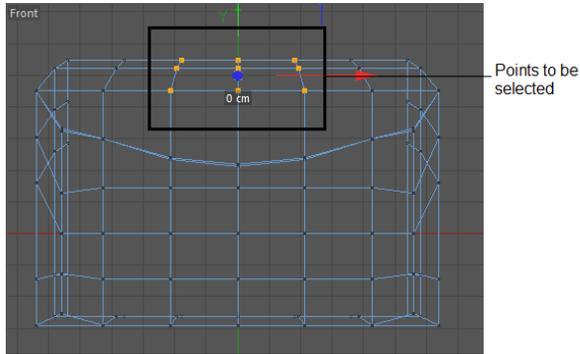


Figure 3-23 The points to be selected

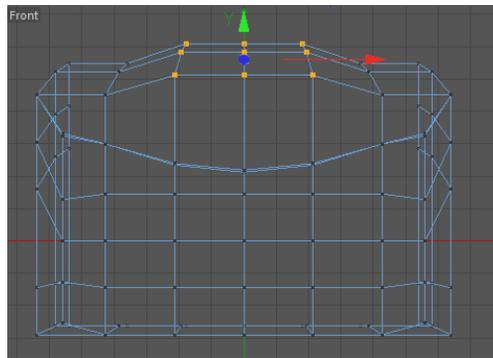


Figure 3-24 Moving the selected points upward

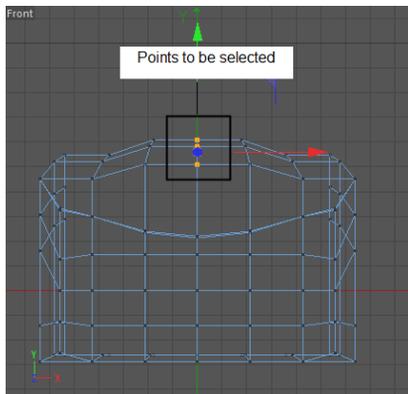


Figure 3-25 The selected points of Computer mouse

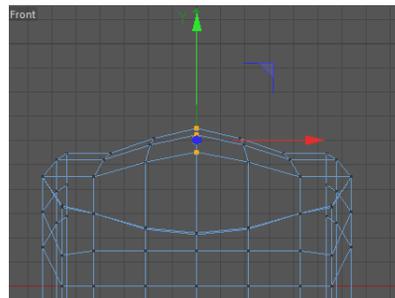


Figure 3-26 Moving the selected points of Computer mouse

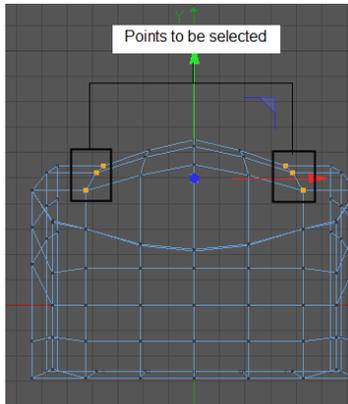


Figure 3-27 The points to be selected

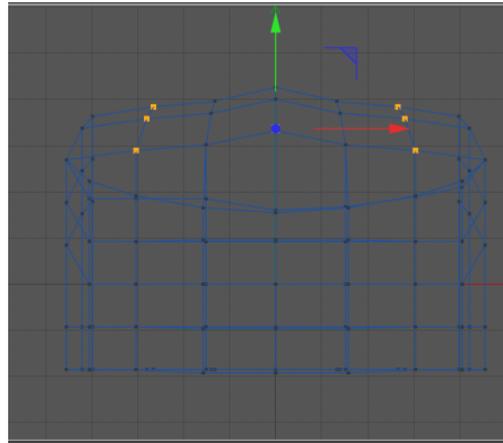


Figure 3-28 Moving the selected points of Computer mouse

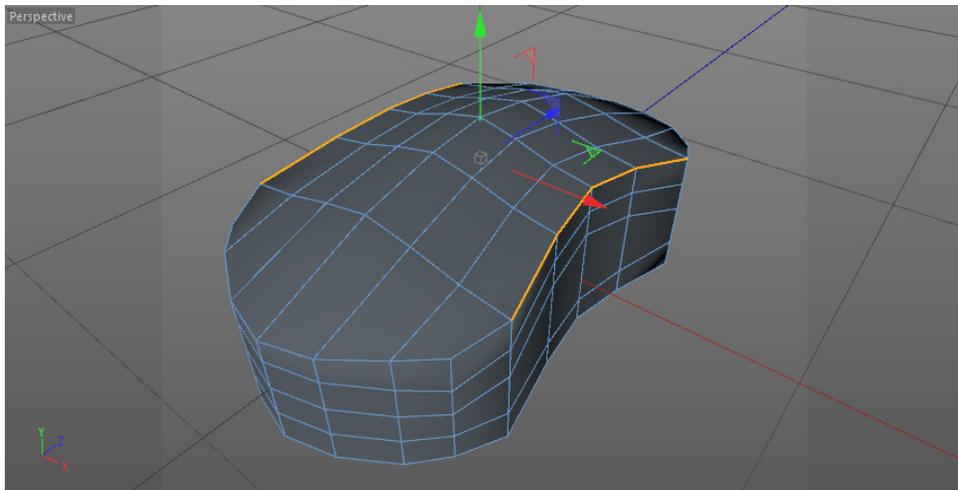


Figure 3-29 The selected edges in the Perspective viewport

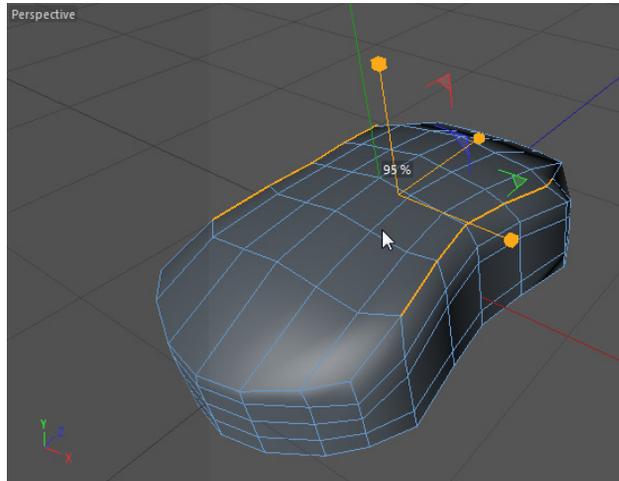


Figure 3-30 *Scaling down the edges of Computer mouse in the Perspective viewport*

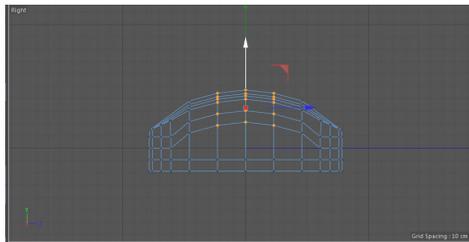


Figure 3-31 *The points to be selected*

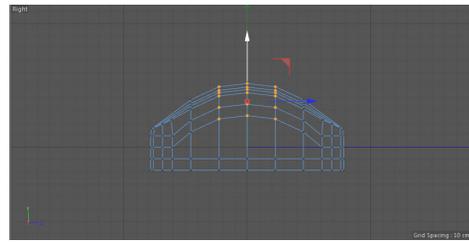


Figure 3-32 *Moving the selected points of Computer mouse*

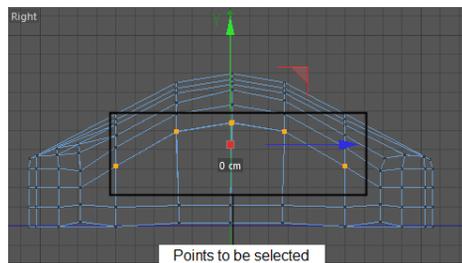


Figure 3-33 *The points to be selected*

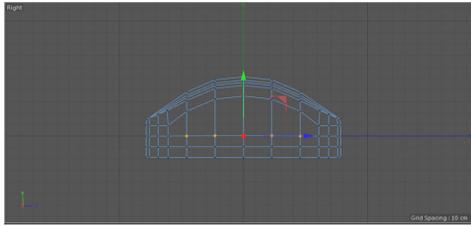


Figure 3-34 *Scaling and moving the points of Computer mouse*

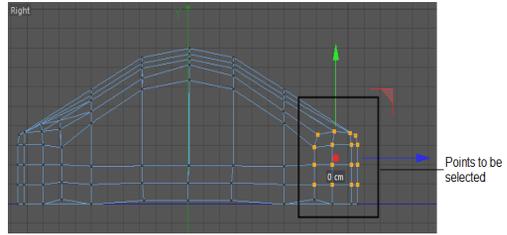


Figure 3-35 *The points of Computer mouse to be selected*

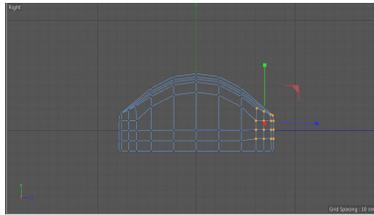


Figure 3-36 *Scaling the points of Computer mouse*

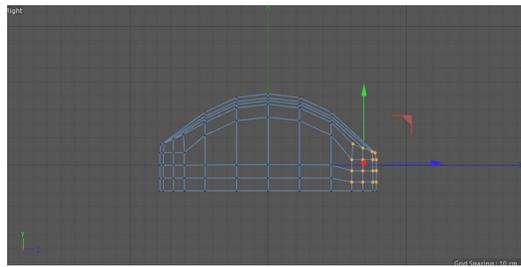


Figure 3-37 *Moving the selected points in the Right viewport*

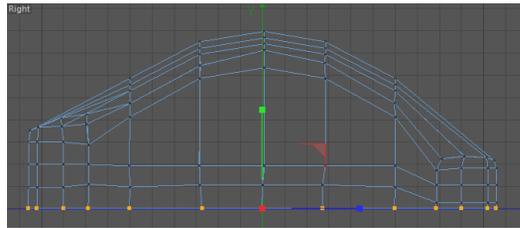


Figure 3-38 *Scaling the points of Computer mouse*

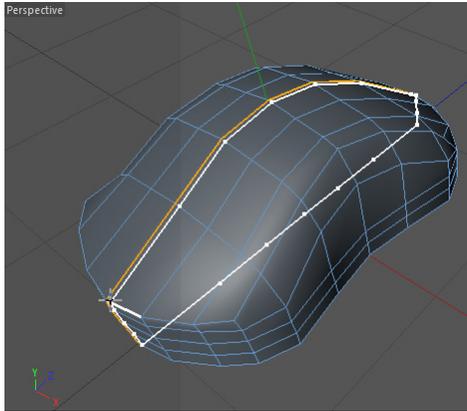


Figure 3-39 Clicking on the right of the middle edge loop

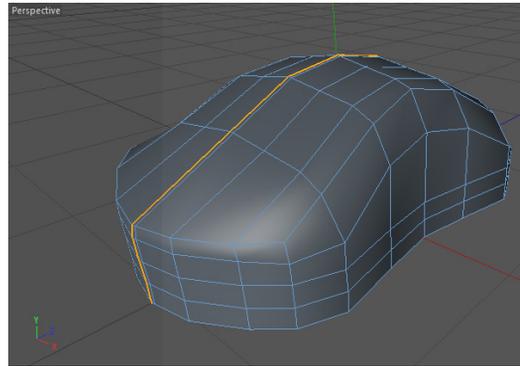


Figure 3-40 A new edge loop added to the Computer mouse

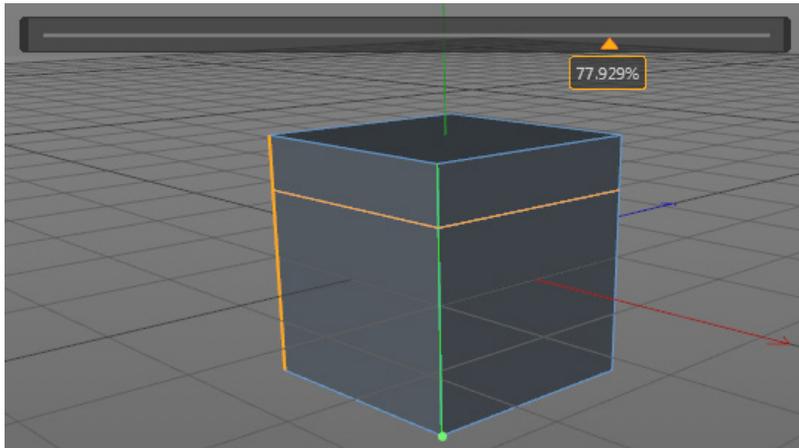


Figure 3-41 The slider displayed at the top of the viewport

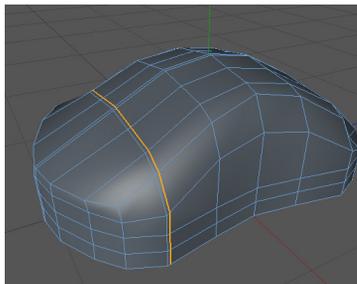


Figure 3-42 A new edge added to Computer mouse

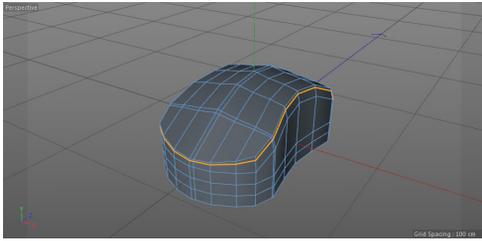


Figure 3-43 A new edge added to Computer mouse

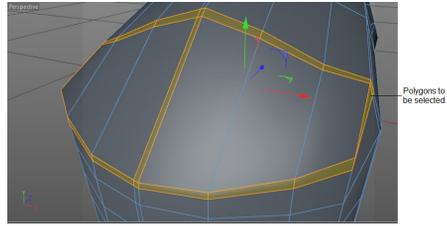


Figure 3-44 The polygons selected

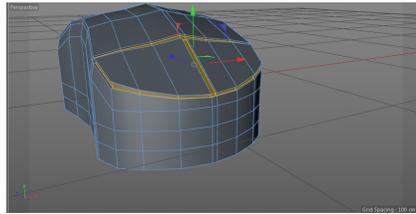


Figure 3-45 The extruded polygons of Computer mouse

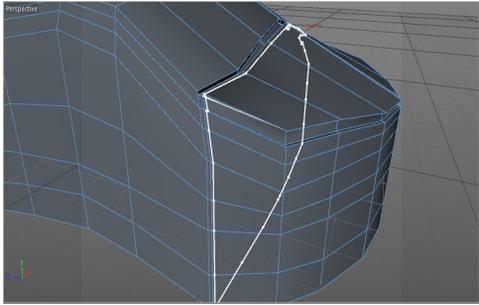


Figure 3-46 An edge loop added to Computer mouse

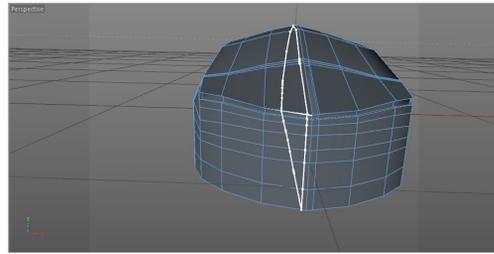


Figure 3-47 An edge loop added to Computer mouse

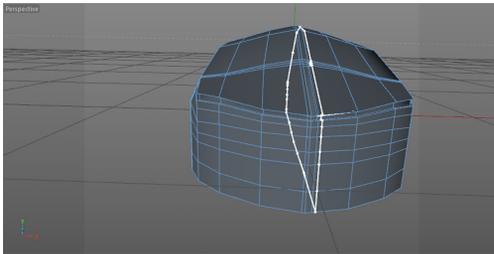


Figure 3-48 An edge loop added to Computer mouse

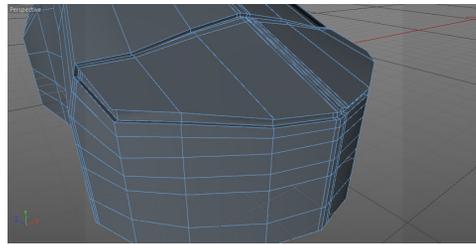


Figure 3-49 The edges added to Computer mouse

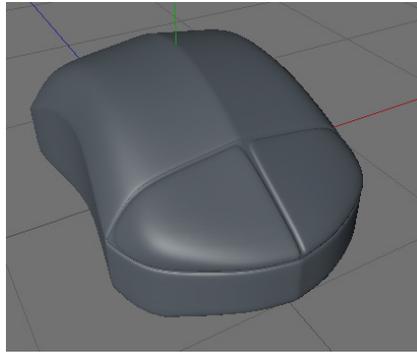


Figure 3-50 *The smoothed Computer mouse*

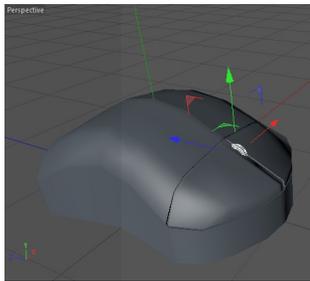


Figure 3-51 *The Scroll wheel placed on Computer mouse*

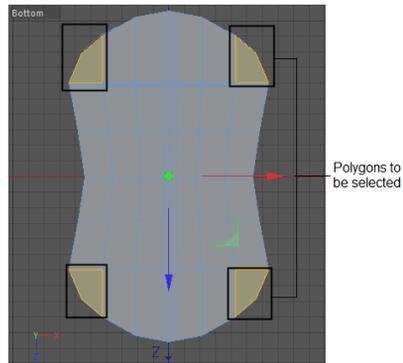


Figure 3-52 *The selected polygons of Computer mouse*

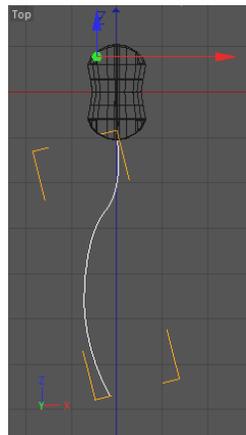


Figure 3-53 *Spline created in the Top viewport*

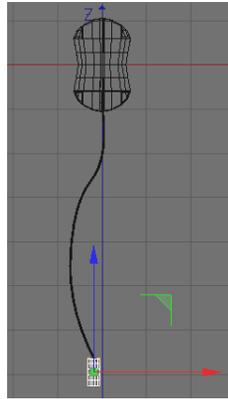


Figure 3-54 Cube placed in the Top viewport

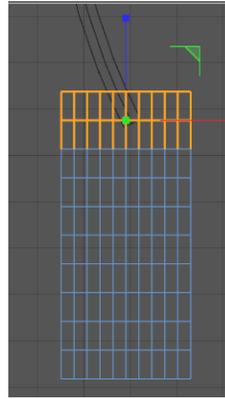


Figure 3-55 The edges to be selected in the Top viewport

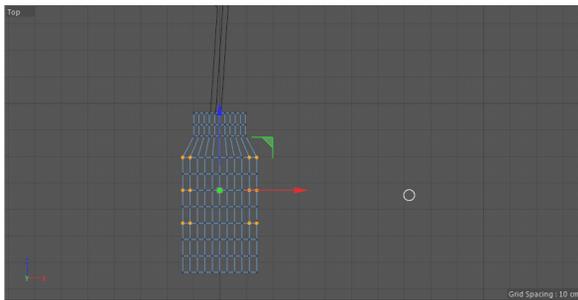


Figure 3-56 The points to be selected

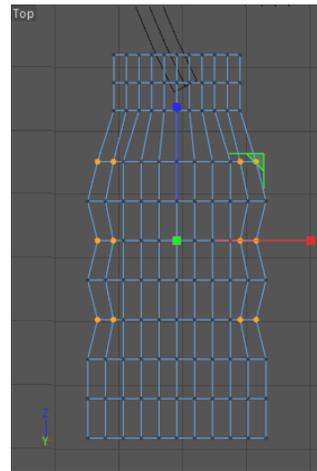


Figure 3-57 Scaling the selected points

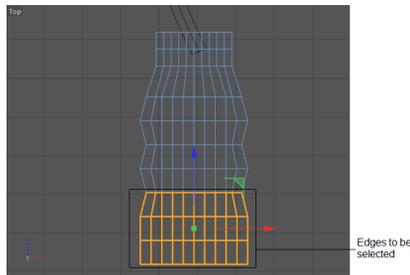


Figure 3-58 The edges selected

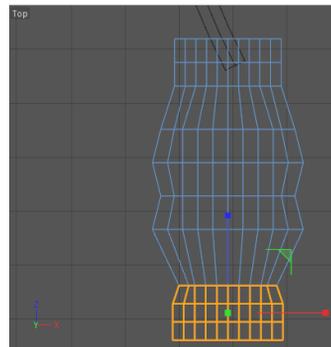


Figure 3-59 Scaling the selected edges

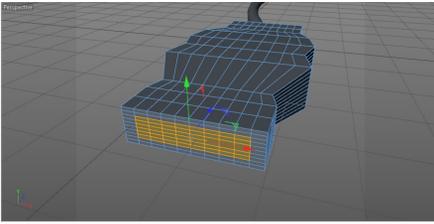


Figure 3-60 *The polygons to be selected*

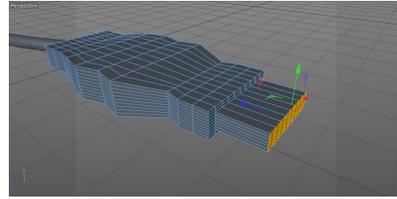


Figure 3-61 *The extruded edge loop*

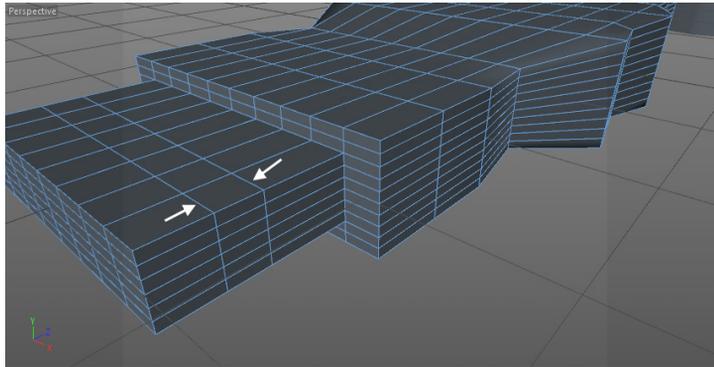


Figure 3-62 *The edges to be added*

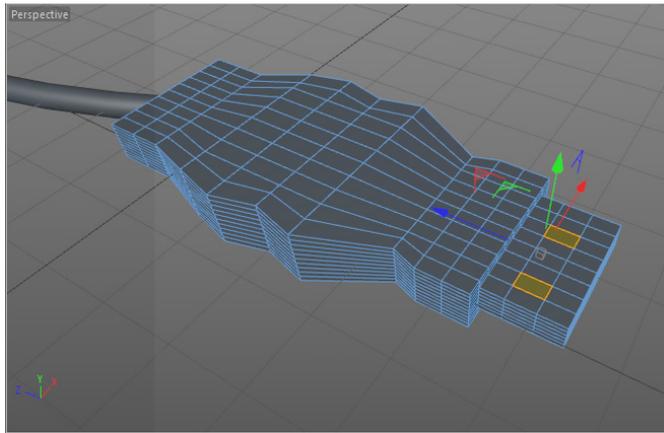


Figure 3-63 *The polygons to be selected*

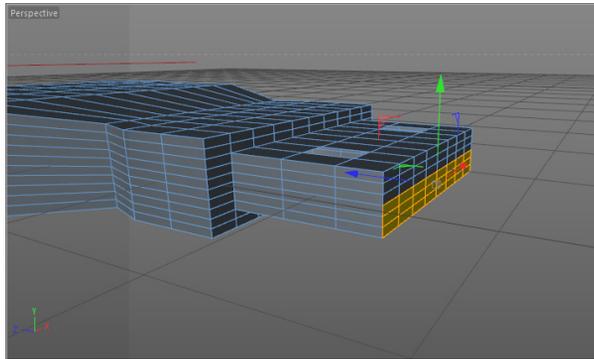


Figure 3-64 The selected polygons

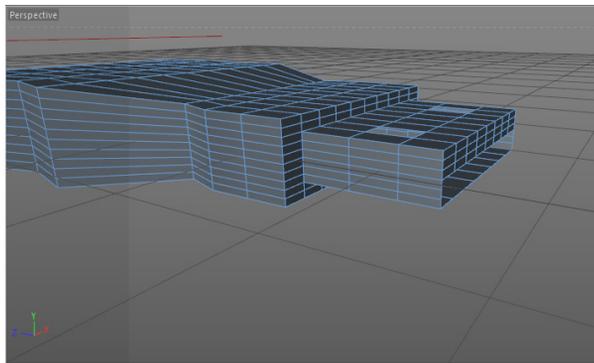


Figure 3-65 The deleted polygons



Figure 3-66 The model of computer table

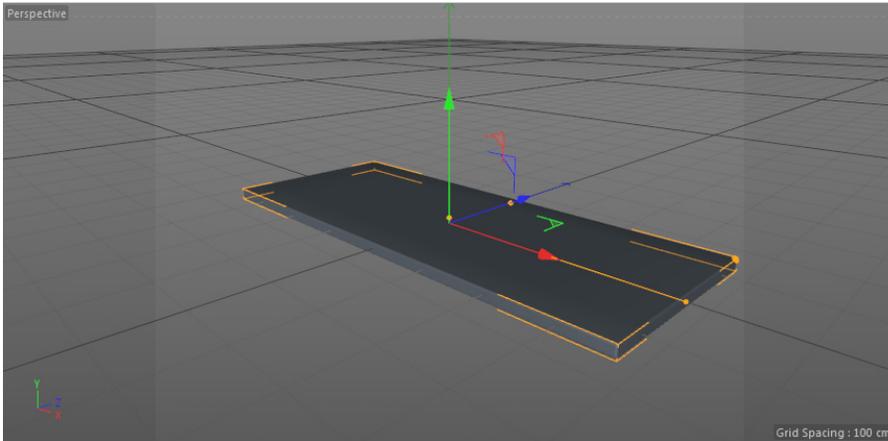


Figure 3-67 *The Computer table in the Perspective viewport*

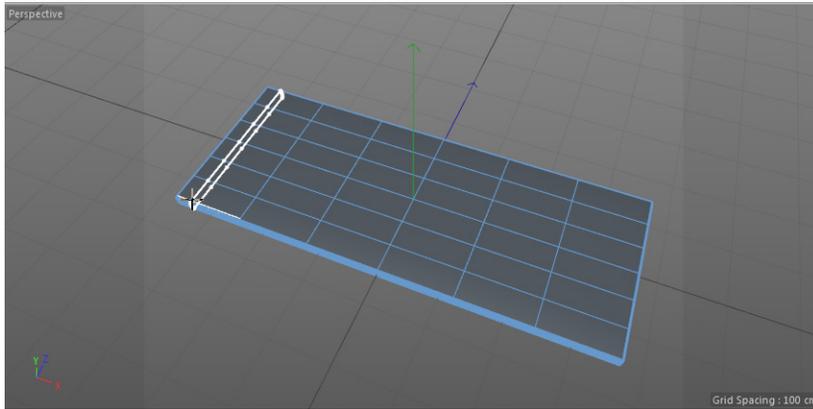


Figure 3-68 *Adding an edge loop*

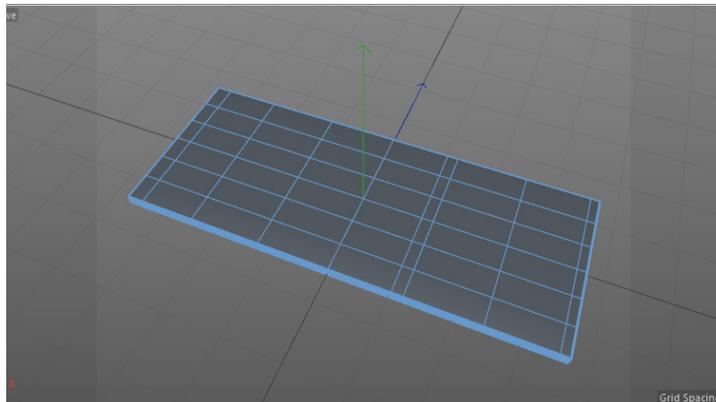


Figure 3-69 *The edge loops added*

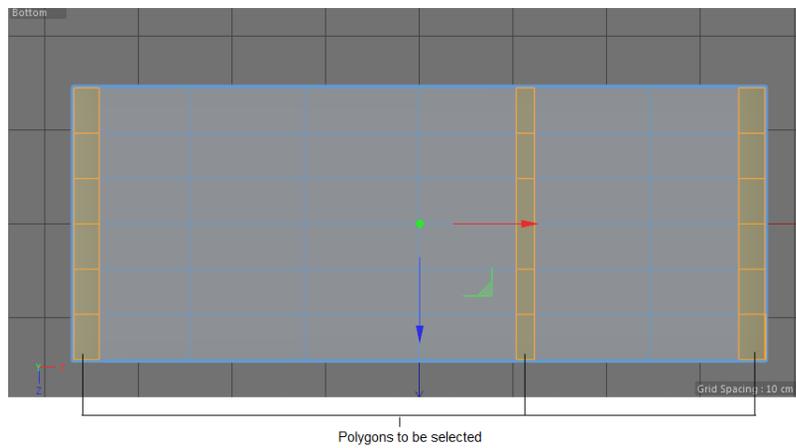


Figure 3-70 The selected polygons of Computer table

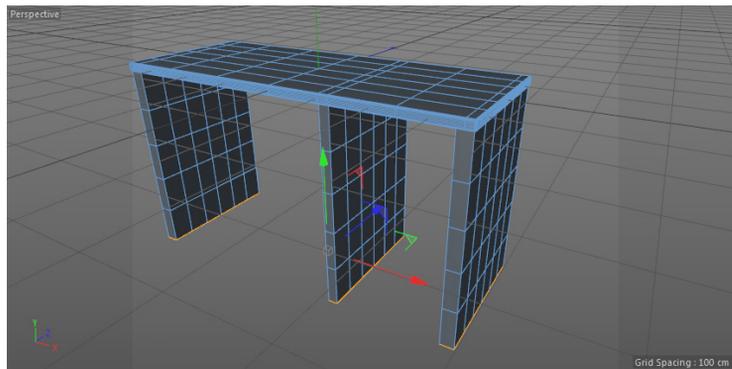


Figure 3-71 The selected polygons extruded in the Perspective viewport

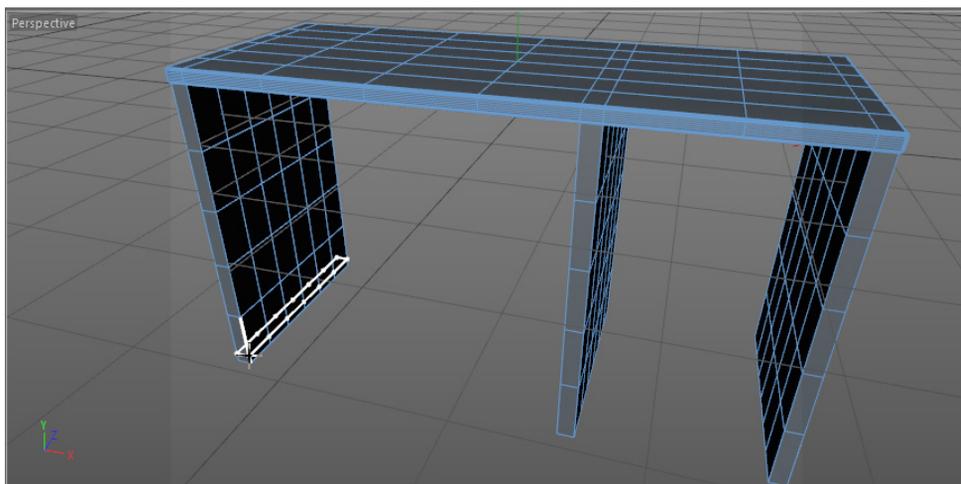


Figure 3-72 Clicking on edge to create a new edge loop

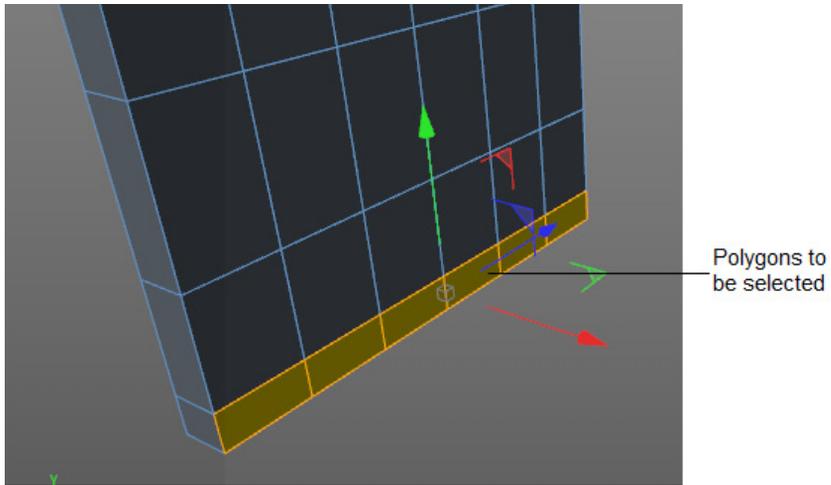


Figure 3-73 The selected polygons of Computer table

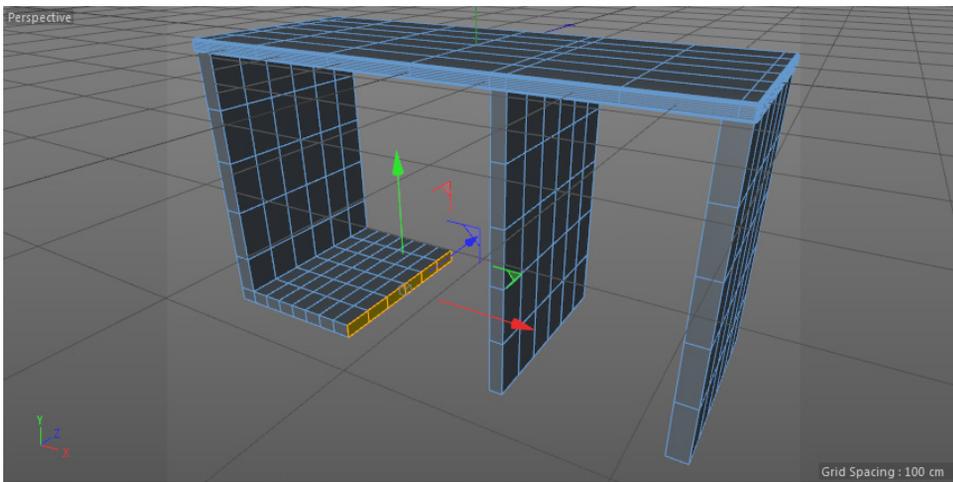


Figure 3-74 The selected polygons extruded in the Perspective viewport

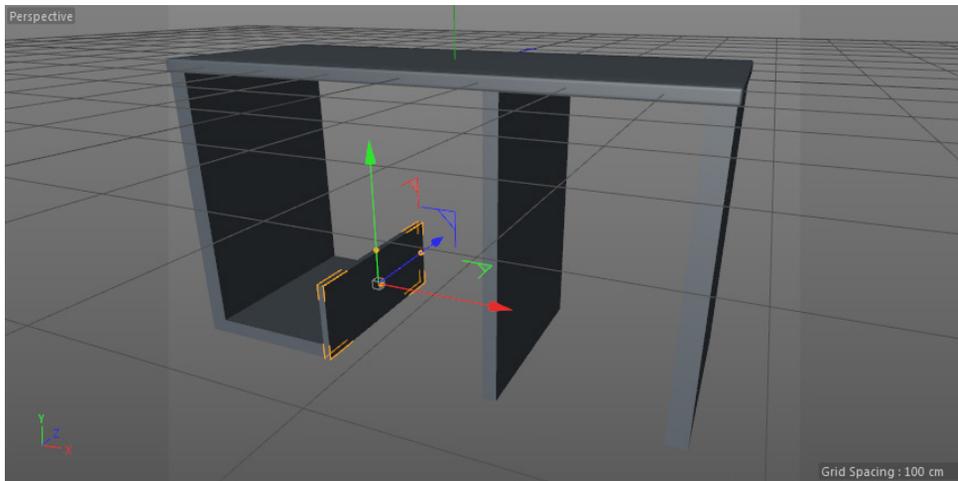


Figure 3-75 Cube aligned in the Perspective viewport

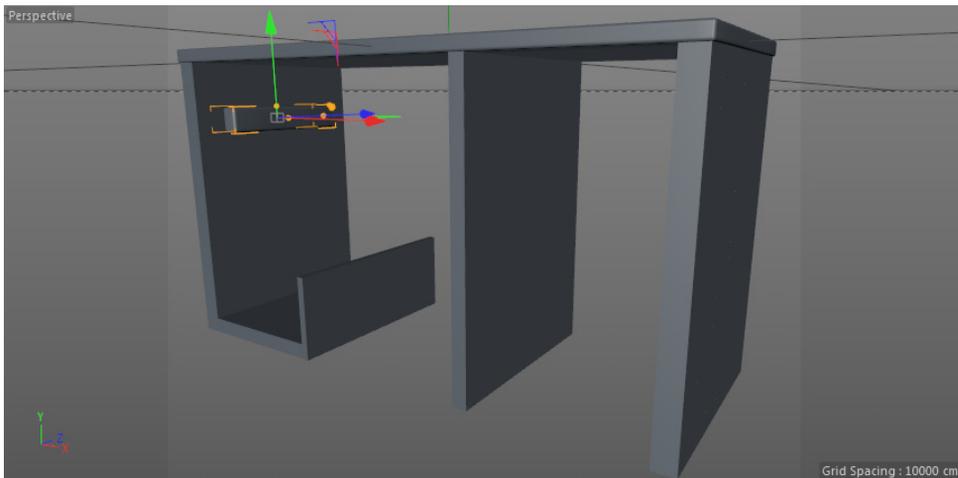


Figure 3-76 Cube.1 positioned in the Perspective viewport

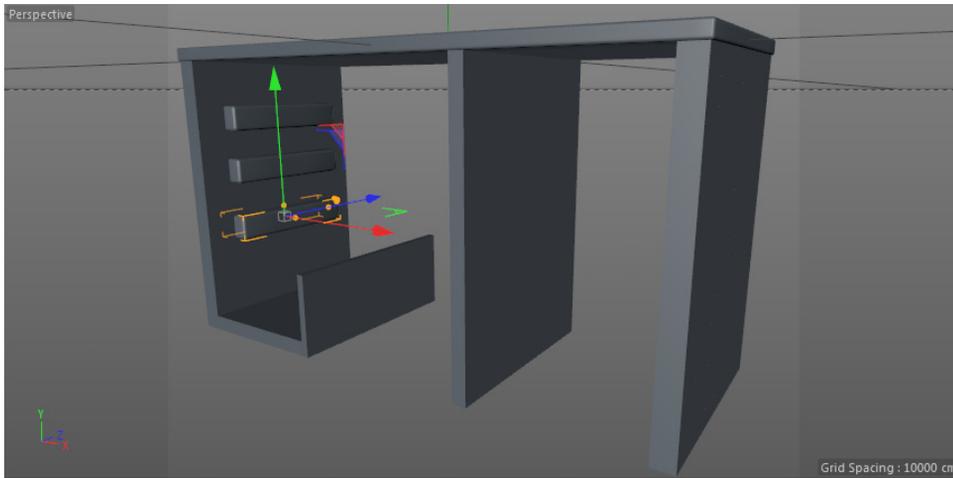


Figure 3-77 Left side positioned in the Perspective viewport

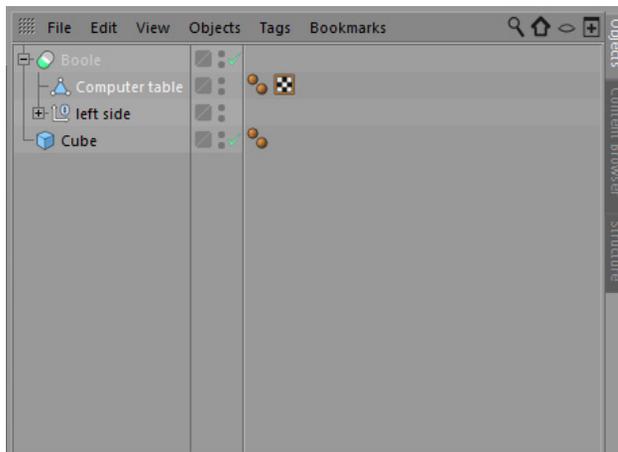


Figure 3-78 Boole connected to Computer table

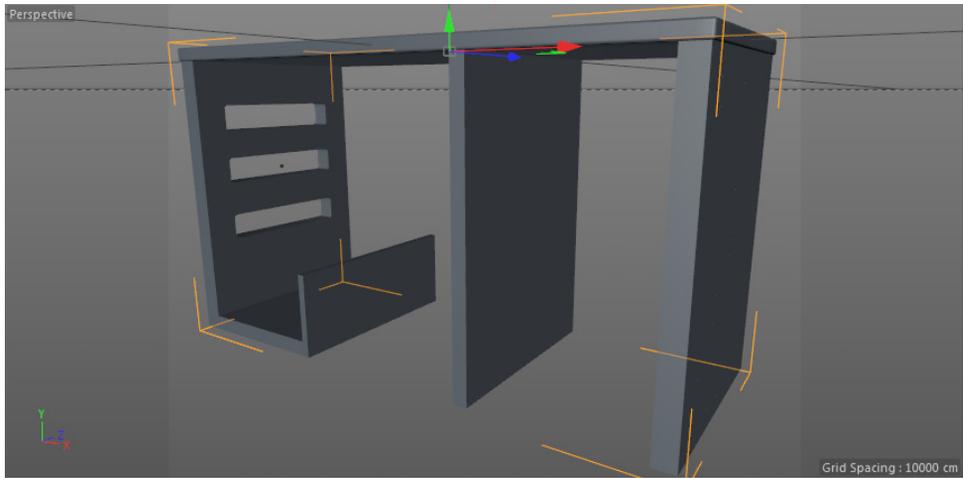


Figure 3-79 The holes created in the side support of the Computer table

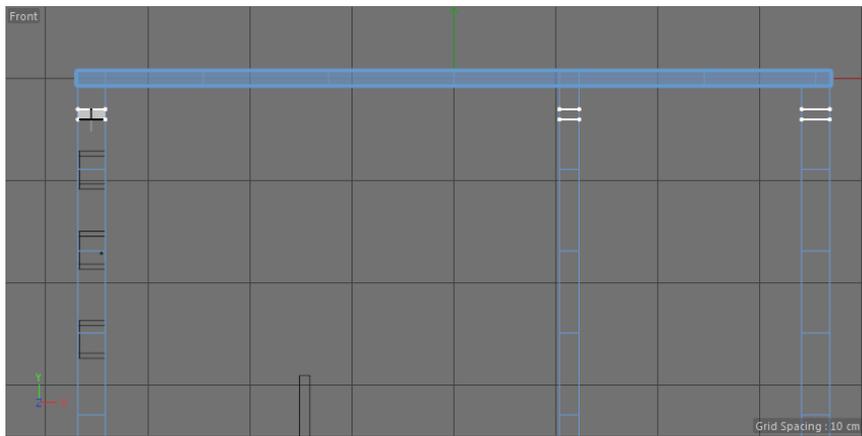


Figure 3-80 Creating an edge using the **Plane Cut** tool

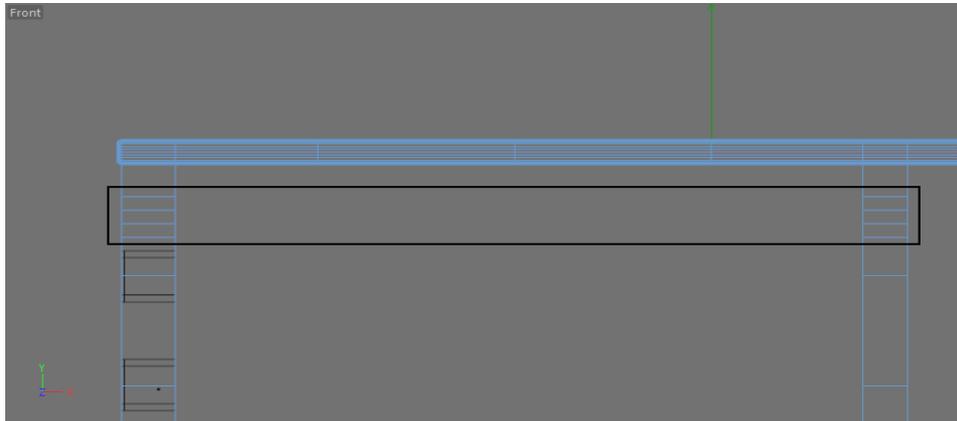


Figure 3-81 Four new edge loops added to the Computer table

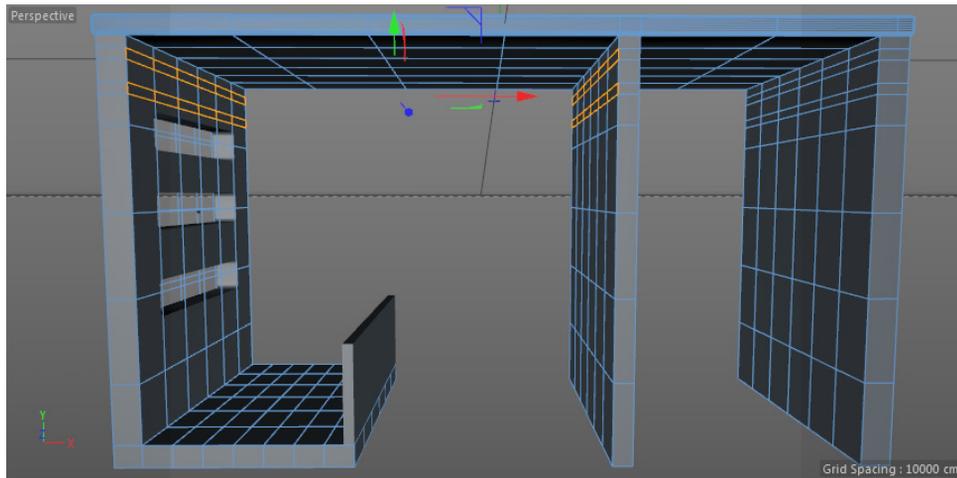


Figure 3-82 The selected polygons of Computer table

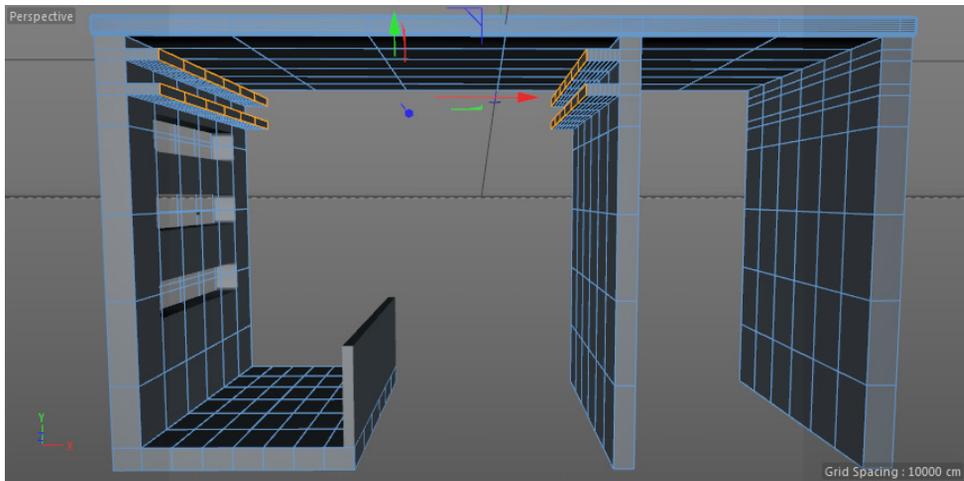


Figure 3-83 The selected polygons extruded in the Perspective viewport

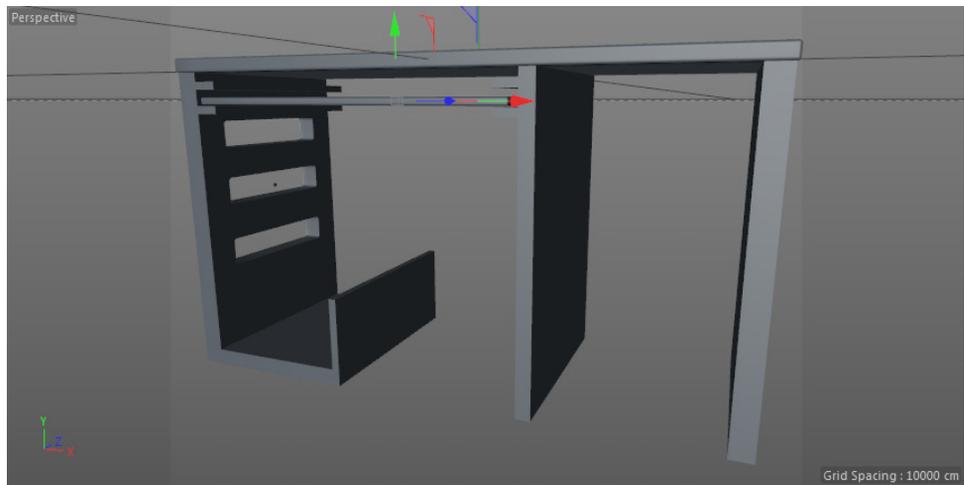


Figure 3-84 The Keyboard support of Computer table

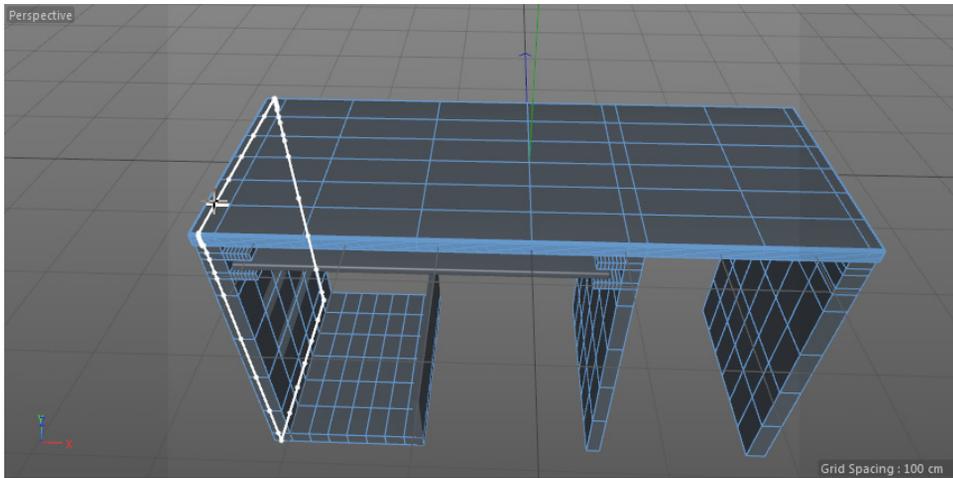


Figure 3-85 New edge loop created

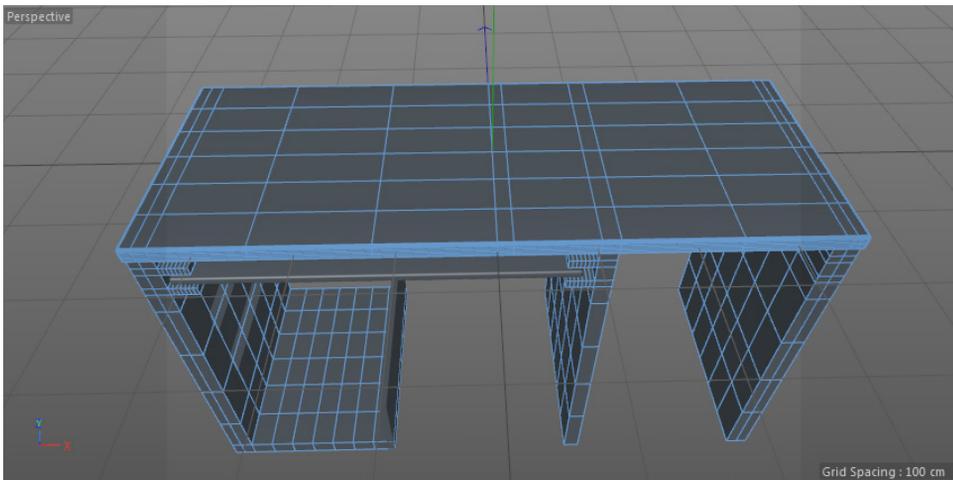


Figure 3-86 Another edge loop added to Computer table

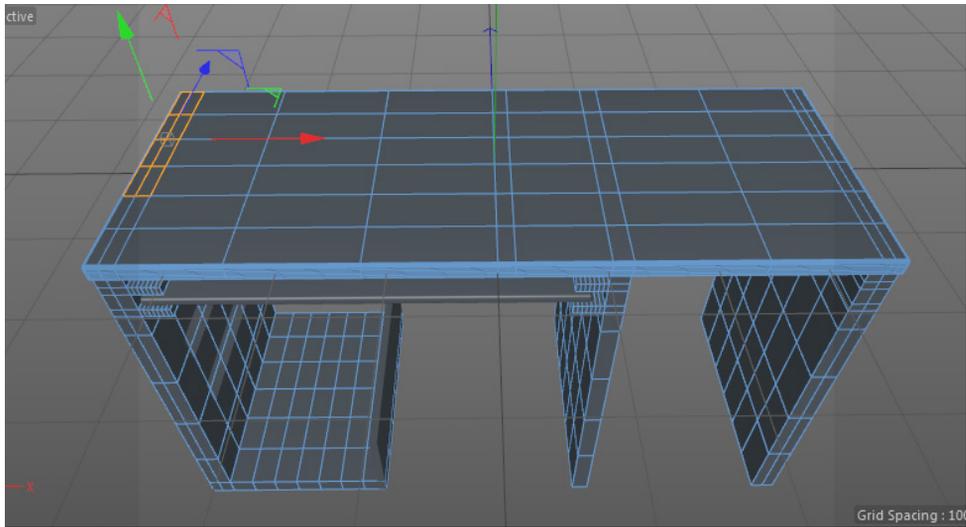


Figure 3-87 The selected polygons of Computer table

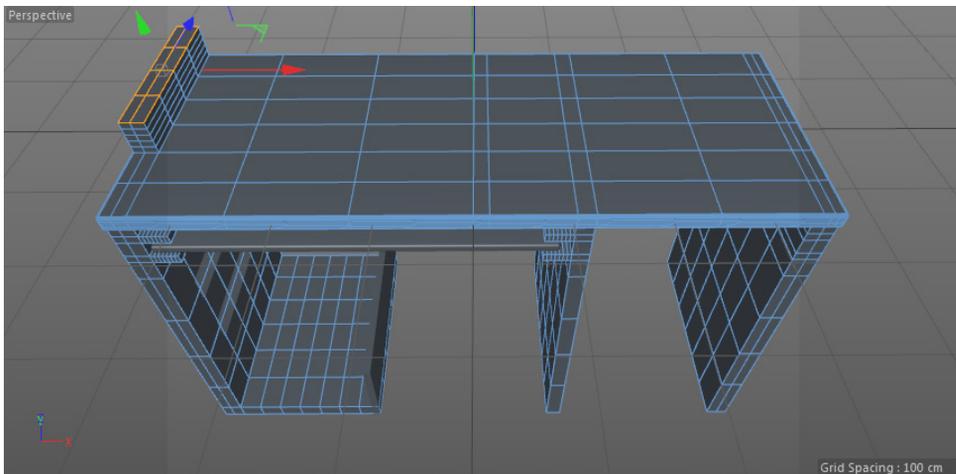


Figure 3-88 The selected polygons extruded in the Perspective viewport

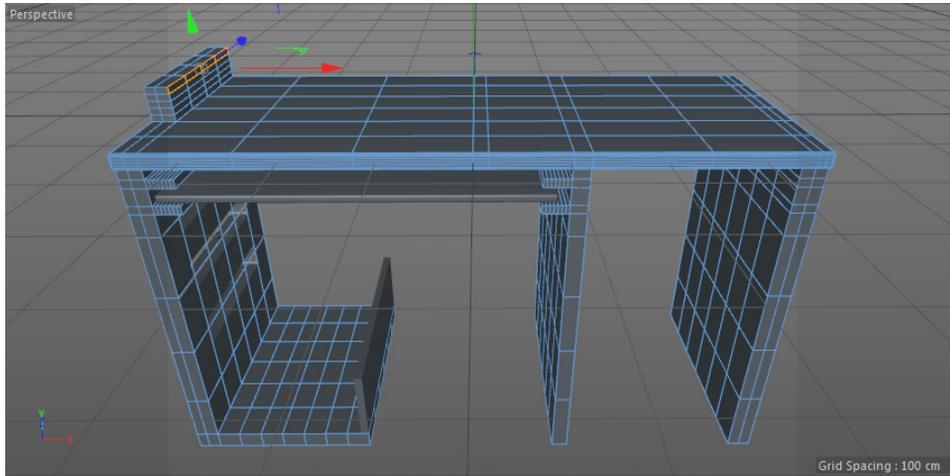


Figure 3-89 The selected polygons of Computer table

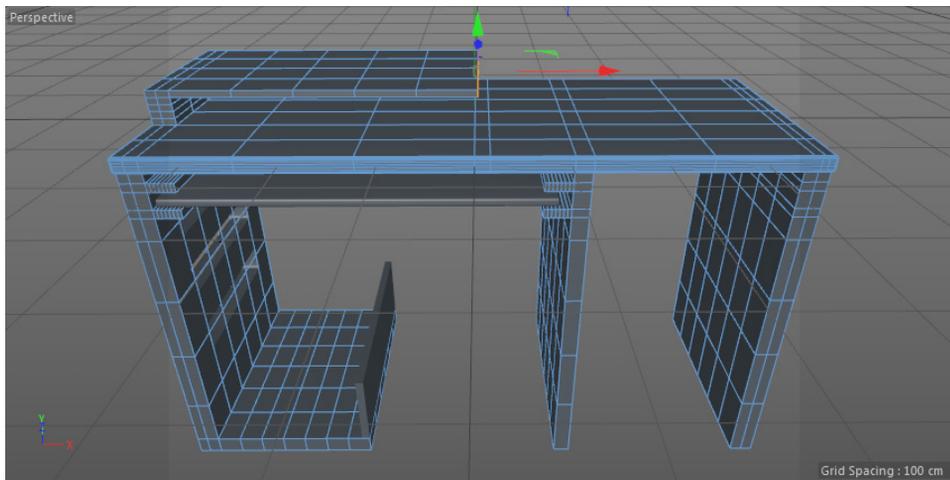


Figure 3-90 The selected polygons extruded in the Perspective viewport

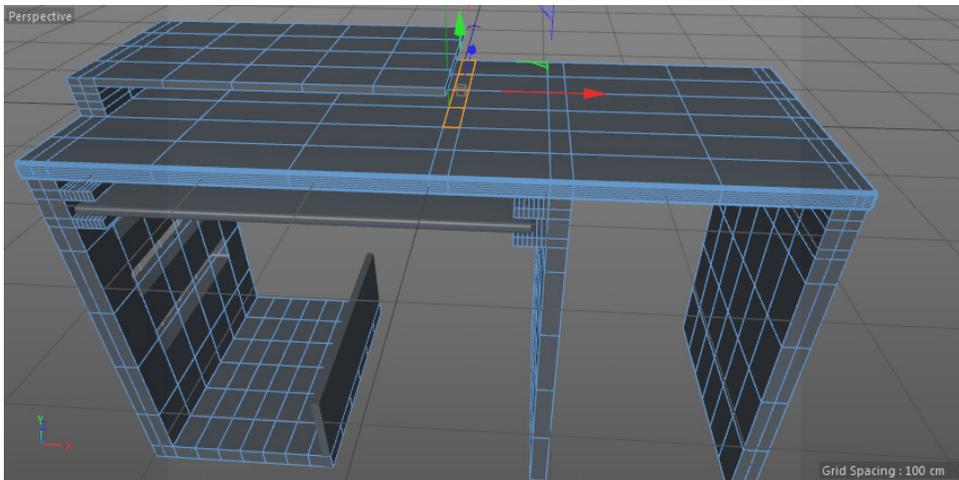


Figure 3-91 The selected polygons of Computer table

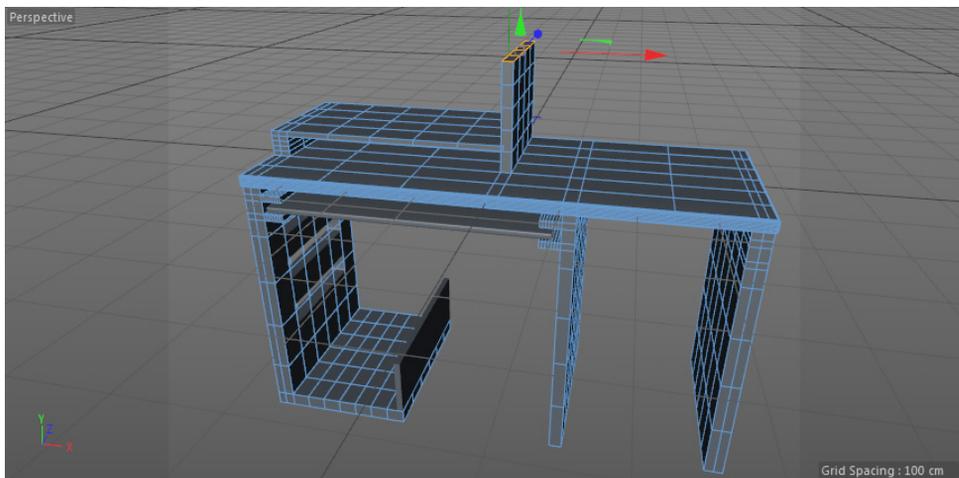


Figure 3-92 The selected polygons extruded in the Perspective viewport

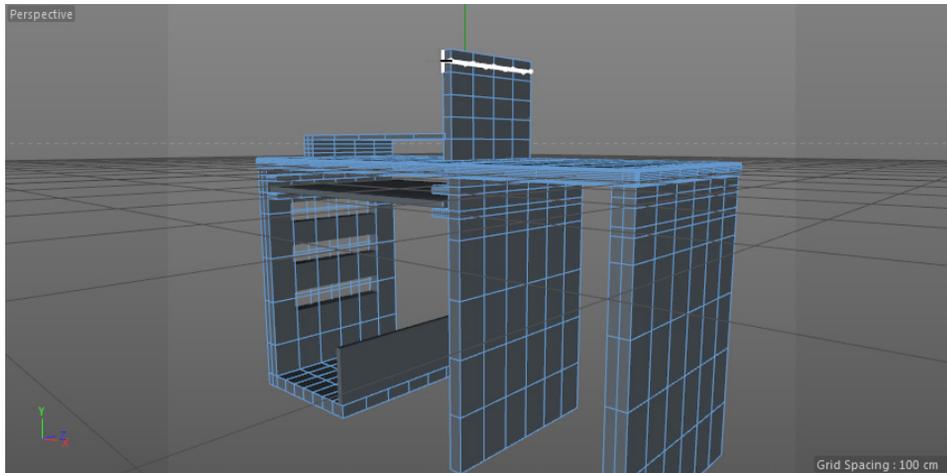


Figure 3-93 Clicking on edge to create a new edge loop

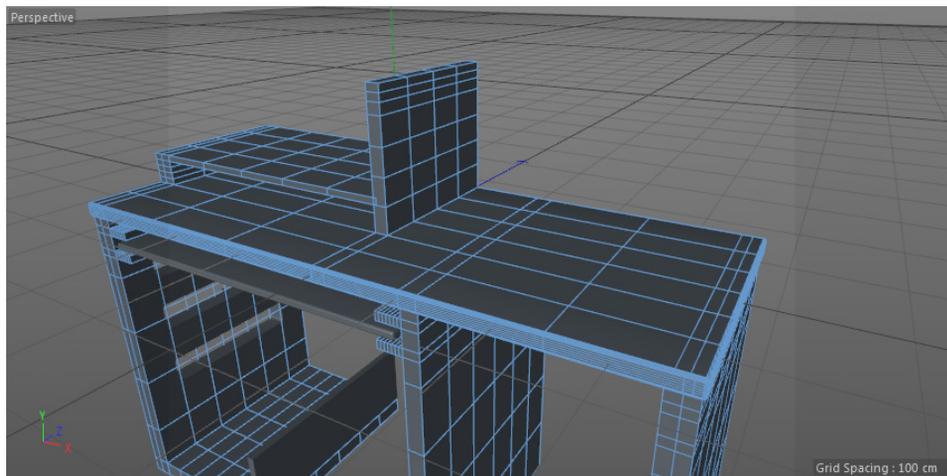


Figure 3-94 Two new edge loops added to the Computer table

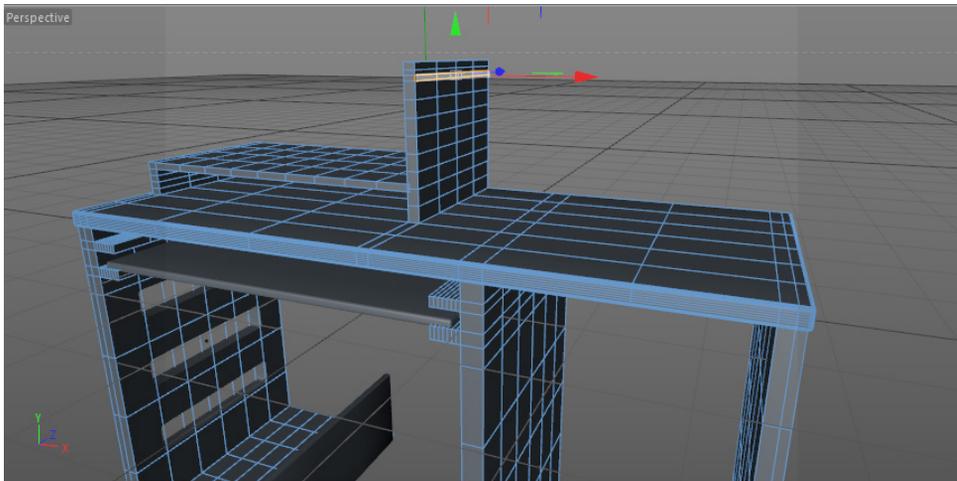


Figure 3-95 The selected polygons of Computer table

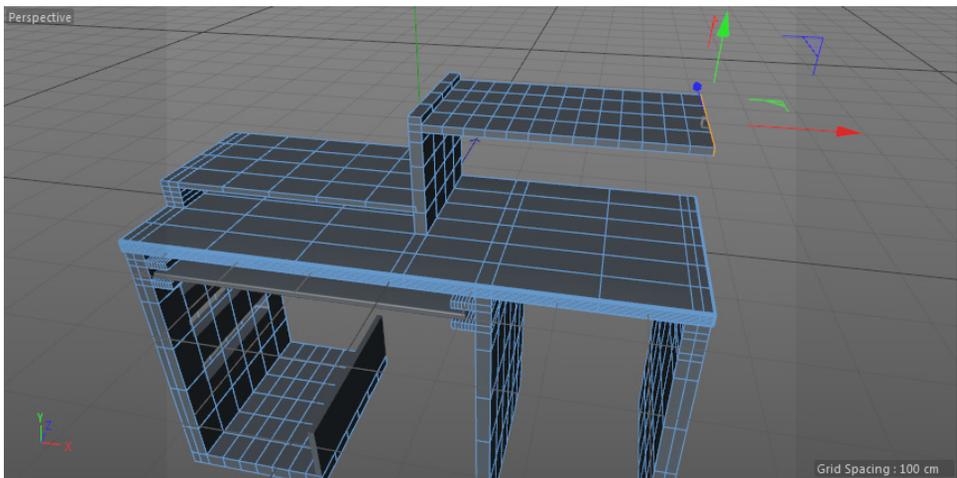


Figure 3-96 The selected polygons extruded in the Perspective viewport

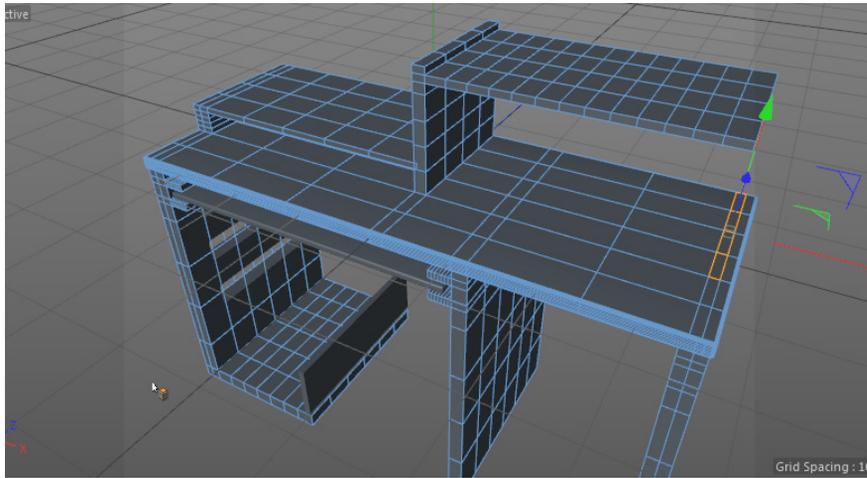


Figure 3-97 The selected polygons of Computer table

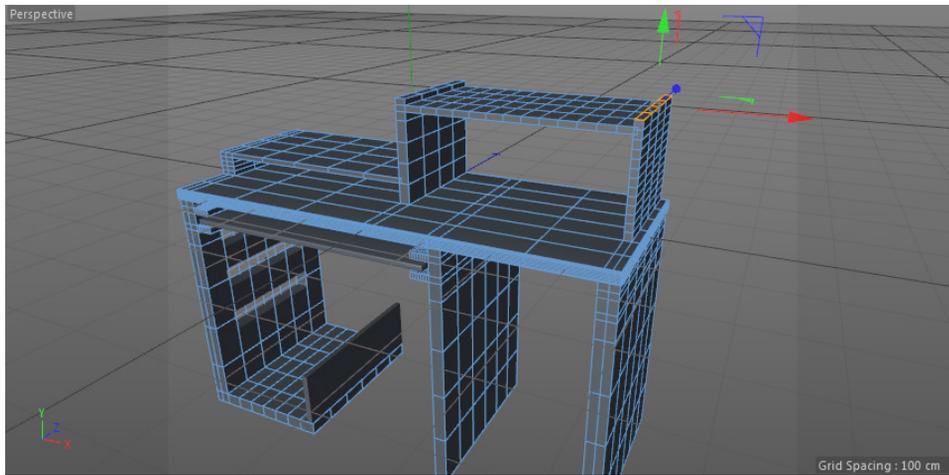


Figure 3-98 The selected polygons extruded in the Perspective viewport

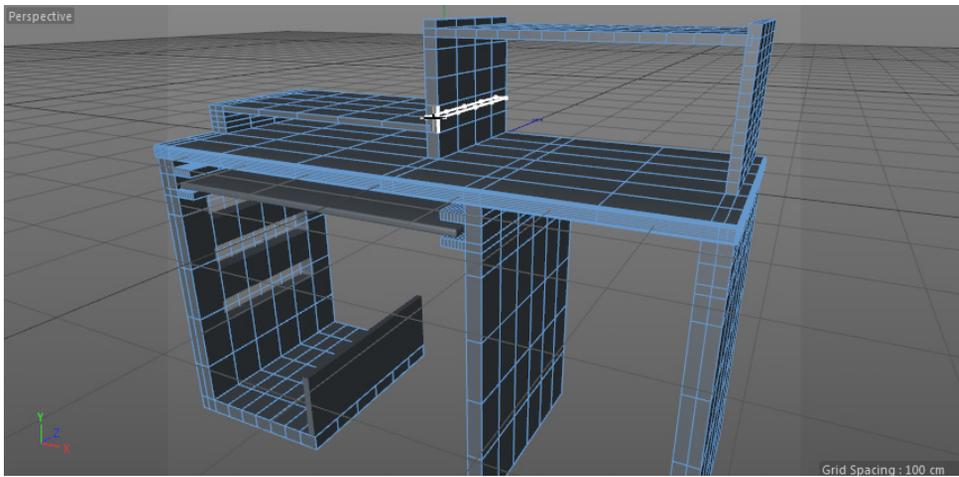


Figure 3-99 Clicking on edge to create a new edge loop

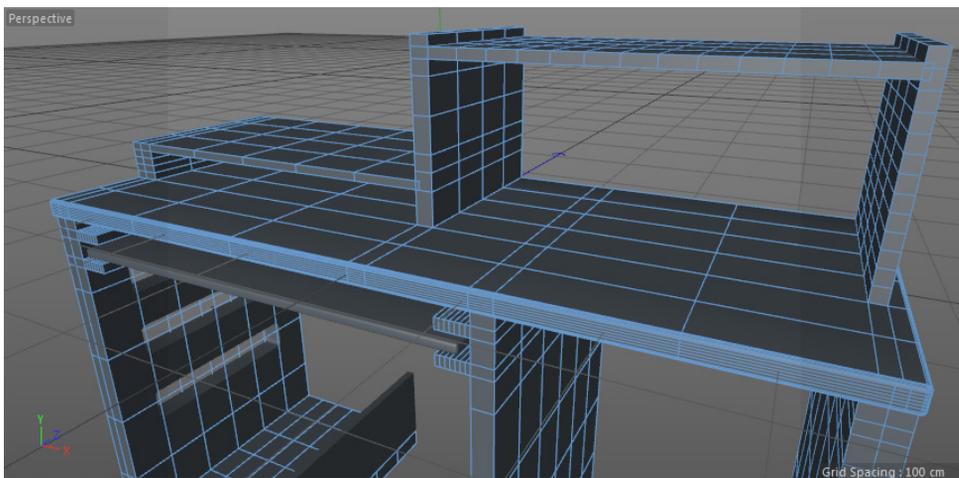


Figure 3-100 The new edge loop added to the Computer table

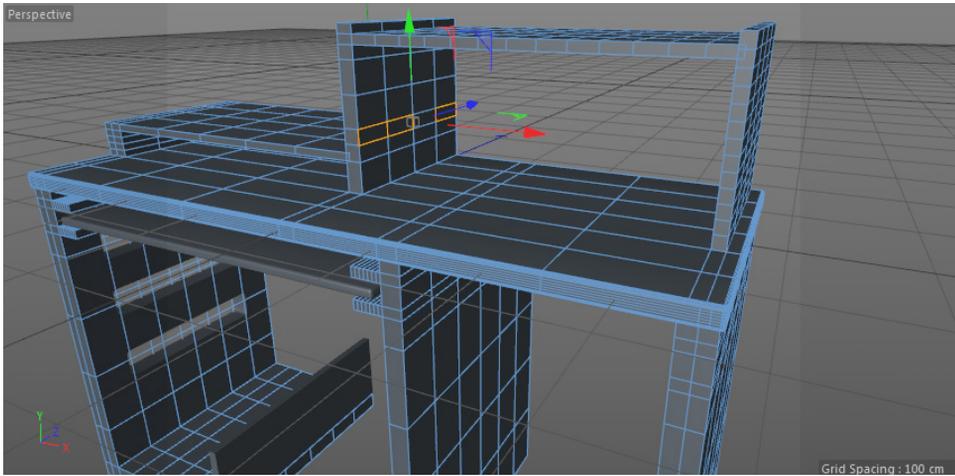


Figure 3-101 The selected polygons of Computer table

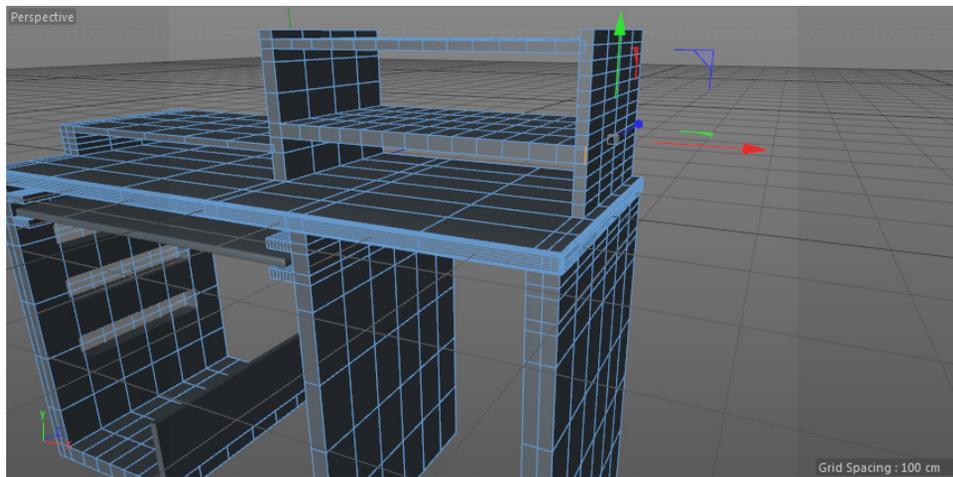


Figure 3-102 The selected polygons extruded in the Perspective viewport

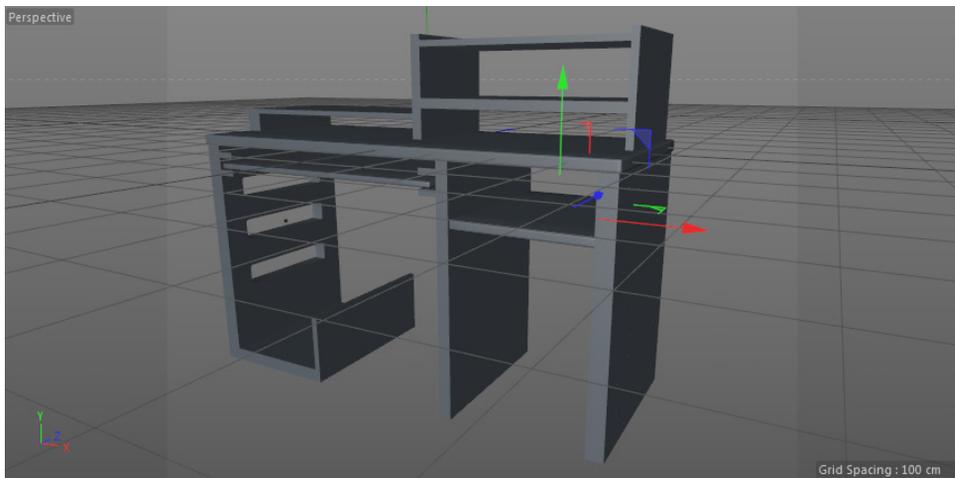


Figure 3-103 Shelf1 positioned in the Perspective viewport

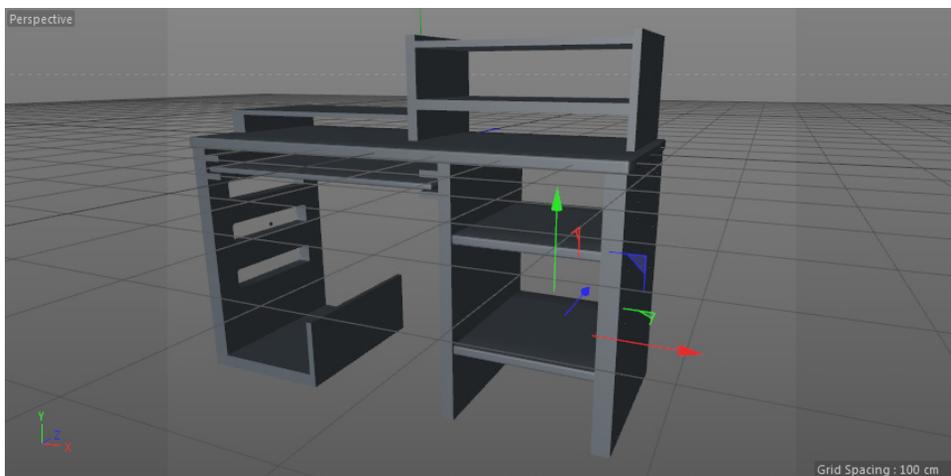


Figure 3-104 Shelf1.1 positioned in the Perspective viewport

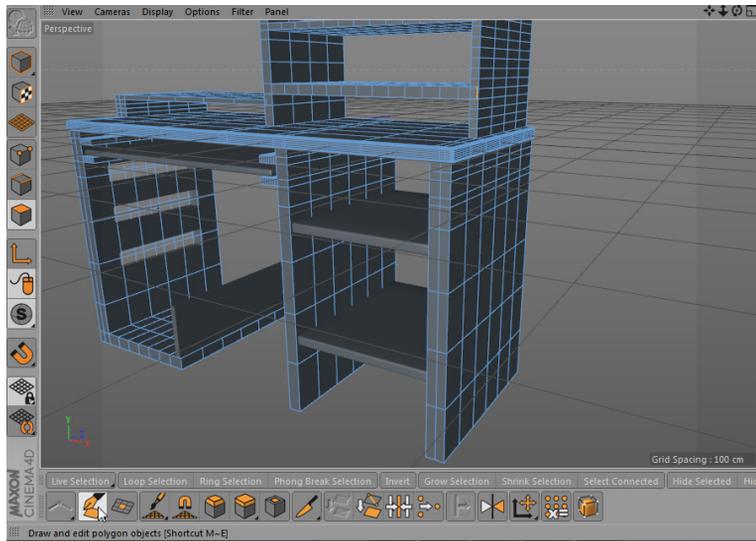


Figure 3-105 Choosing the **Poly Pen** tool from the Modeling Tool Palette

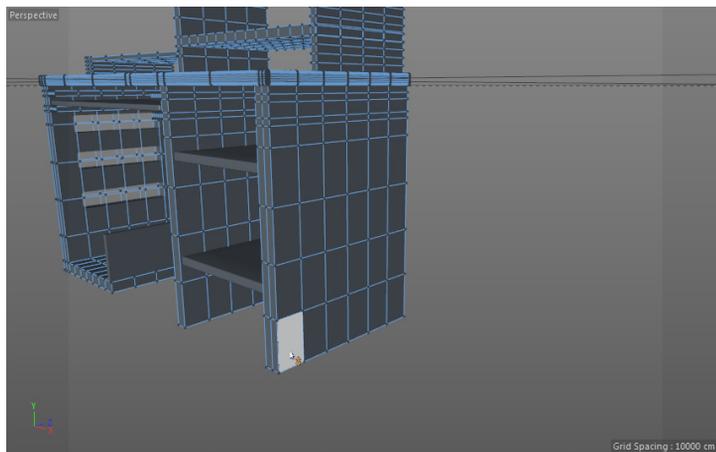


Figure 3-106 The highlighted polygon

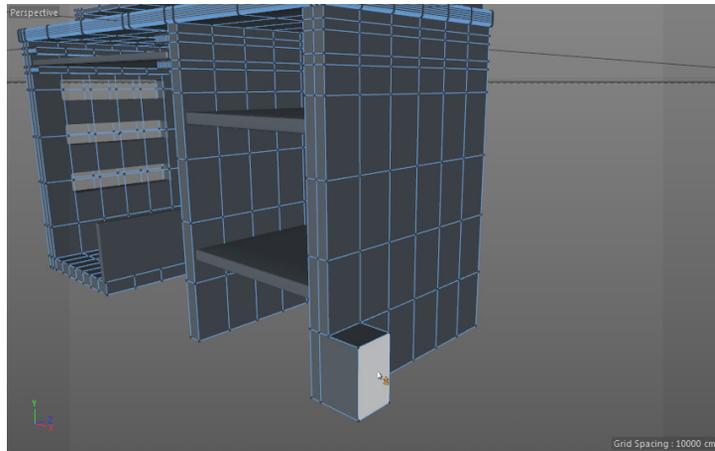


Figure 3-107 Dragging the highlighted polygon

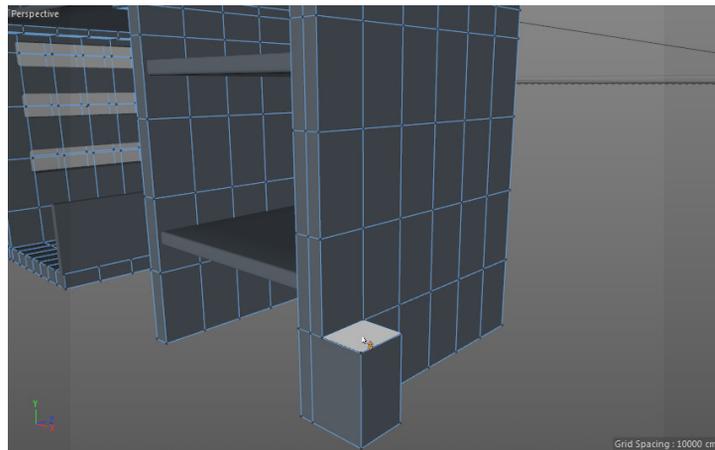


Figure 3-108 The highlighted polygon of magazine stand

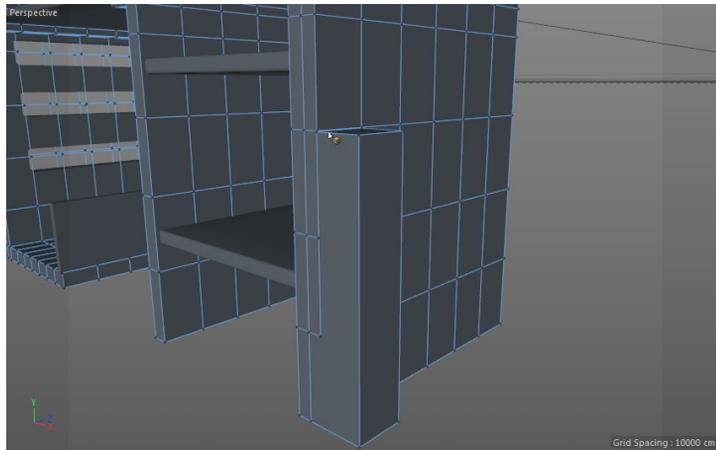


Figure 3-109 Dragging the highlighted polygon

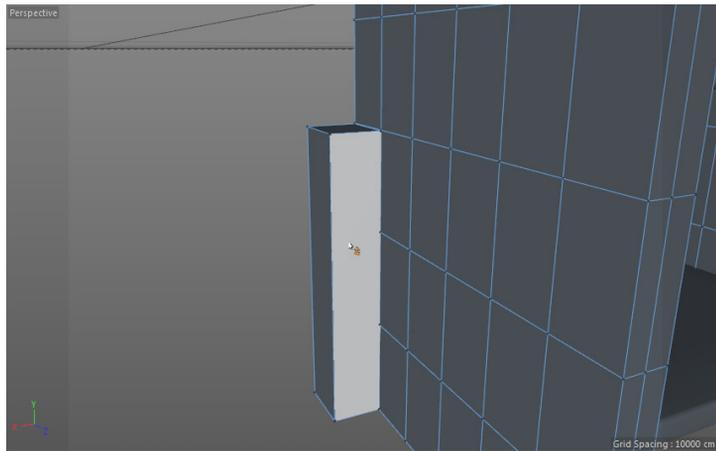


Figure 3-110 Highlighted polygon

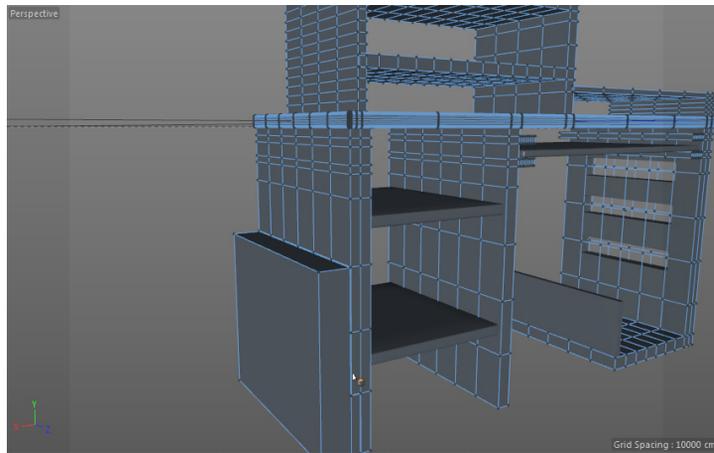


Figure 3-111 Dragging the highlighted polygon

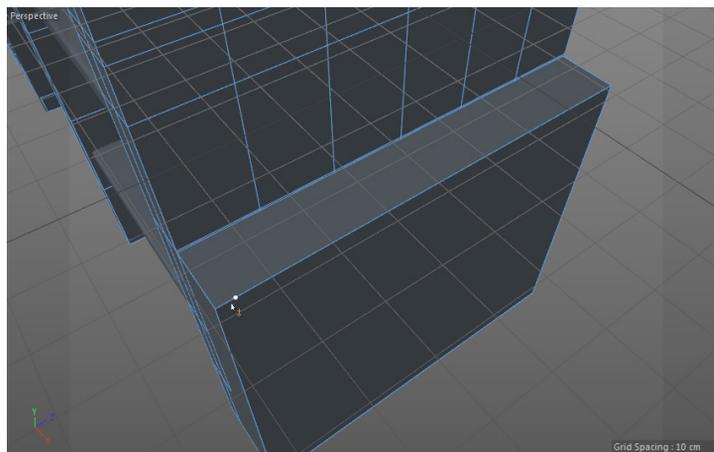


Figure 3-112 Clicking on an edge

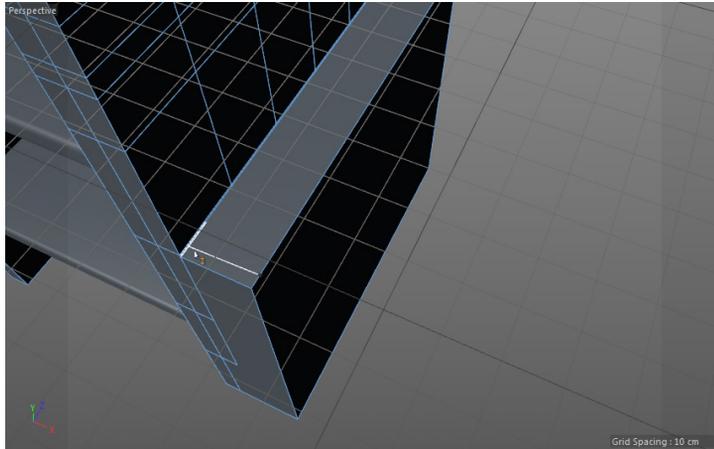


Figure 3-113 Clicking on second edge to create a new edge

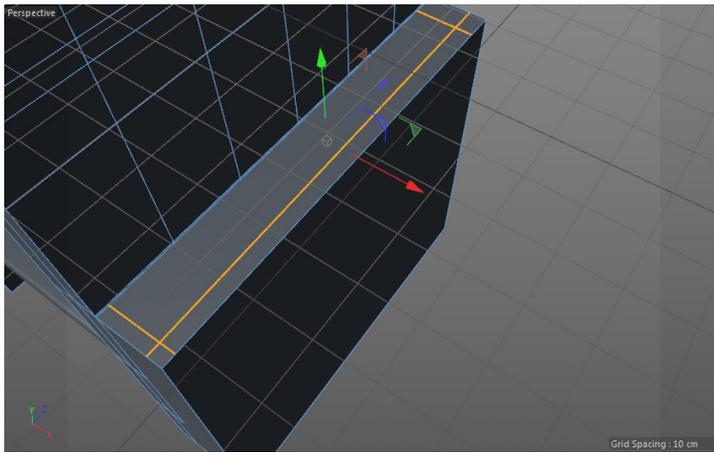


Figure 3-114 Three new edges added to the magazine stand

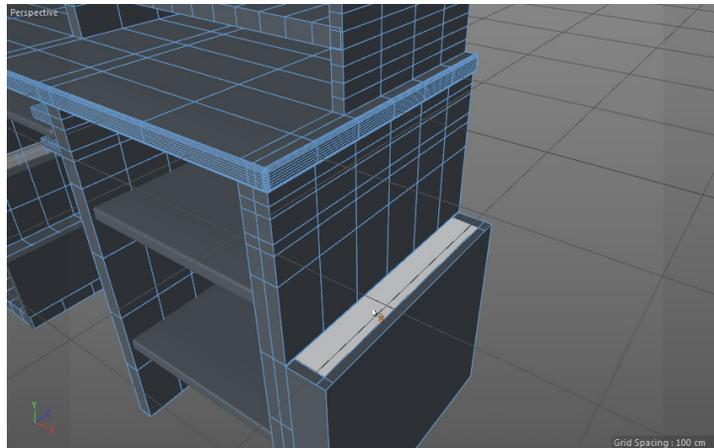


Figure 3-115 Highlighted polygon

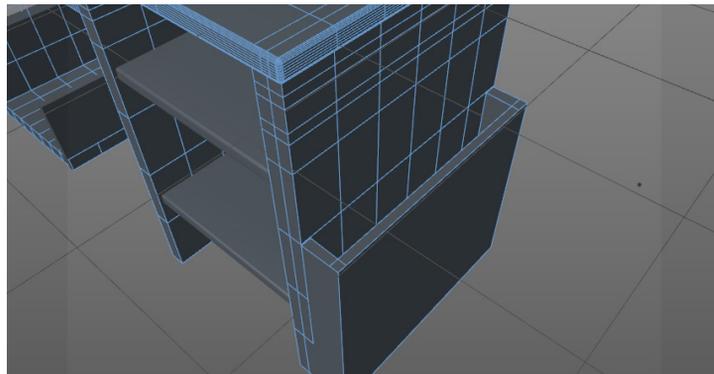


Figure 3-116 Dragging the highlighted polygon downward

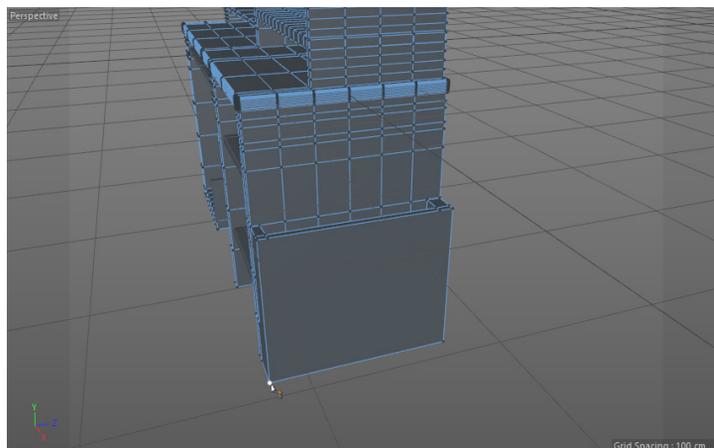


Figure 3-117 Clicking on the corner point

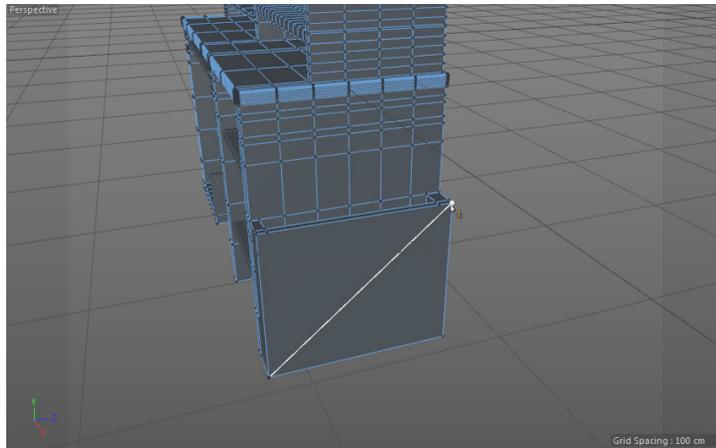


Figure 3-118 The new edge created

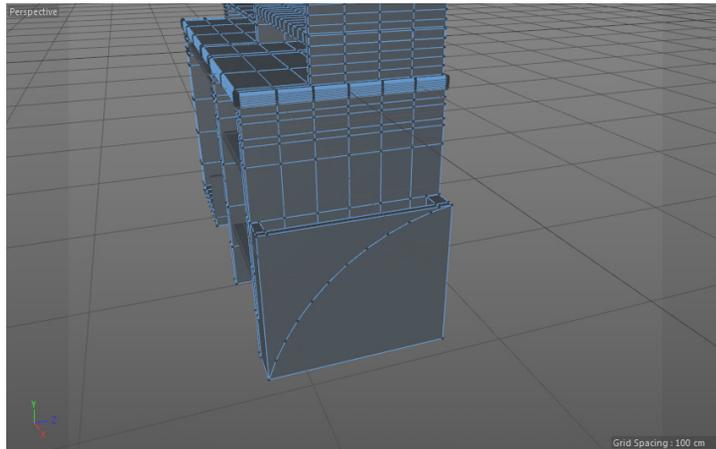


Figure 3-119 The edge converted to an arc shape

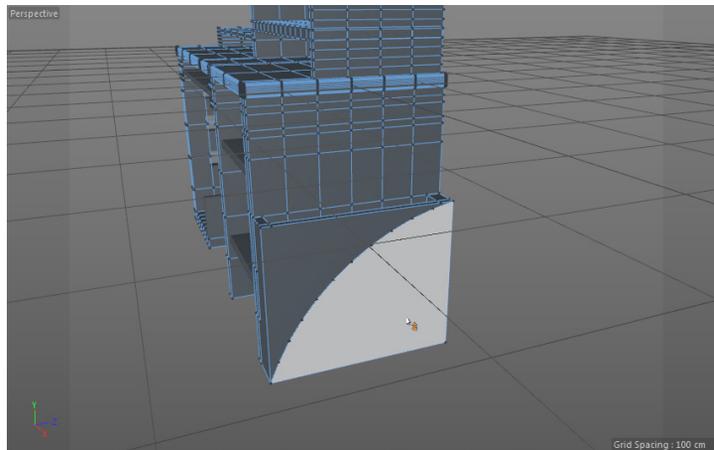


Figure 3-120 Highlighted polygon

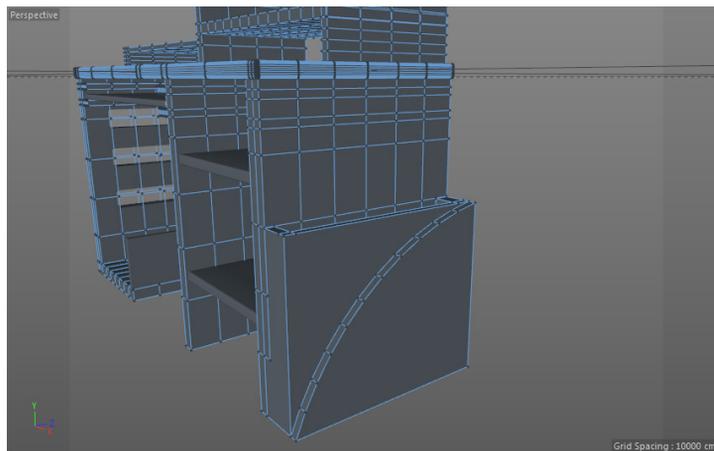


Figure 3-121 The extruded polygon



Figure 3-122 The model of a chair

Chapter 4

Sculpting

Learning Objectives

After completing this chapter, you will be able to:

- *Use various sculpting tools and brushes*
- *Sculpt polygon objects*



Figure 4-1 The model of a candle

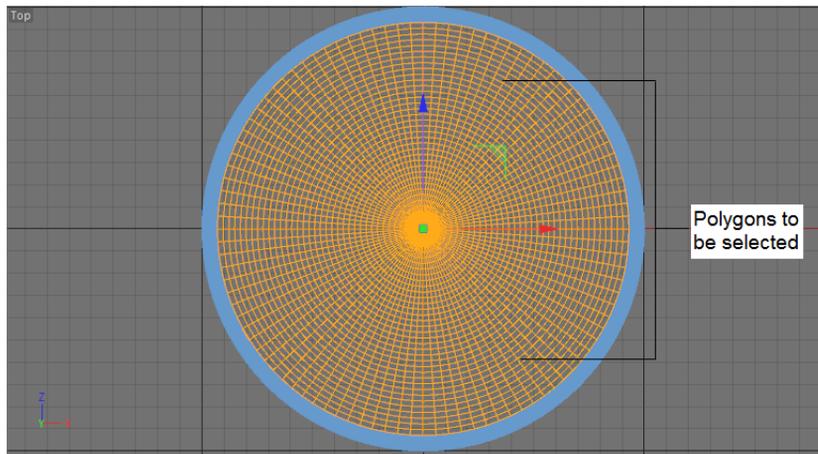


Figure 4-2 The polygons to be selected

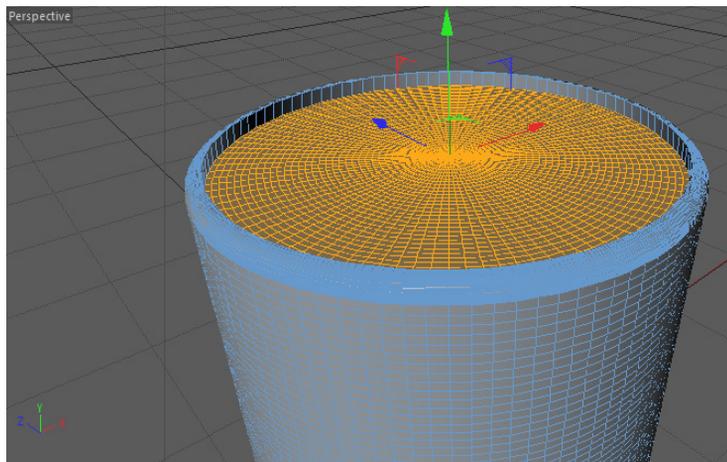


Figure 4-3 Moving the polygons of the Candle downward

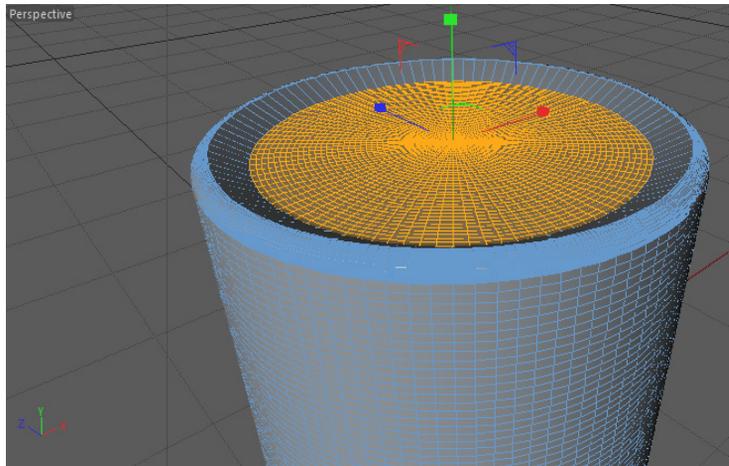


Figure 4-4 Scaling down the polygons of Candle

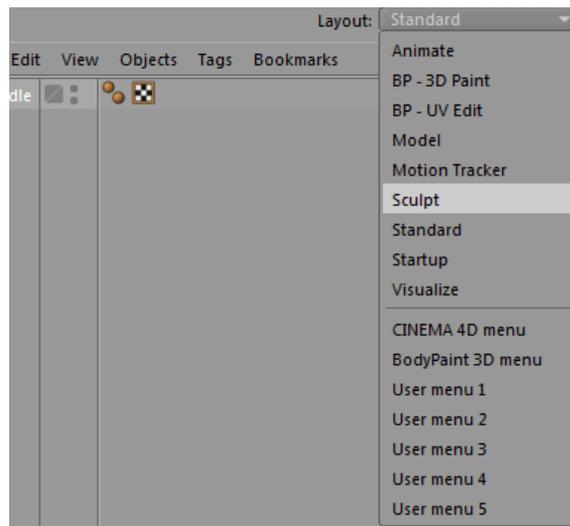


Figure 4-5 Selecting **Sculpt** from the **Layout** drop-down list

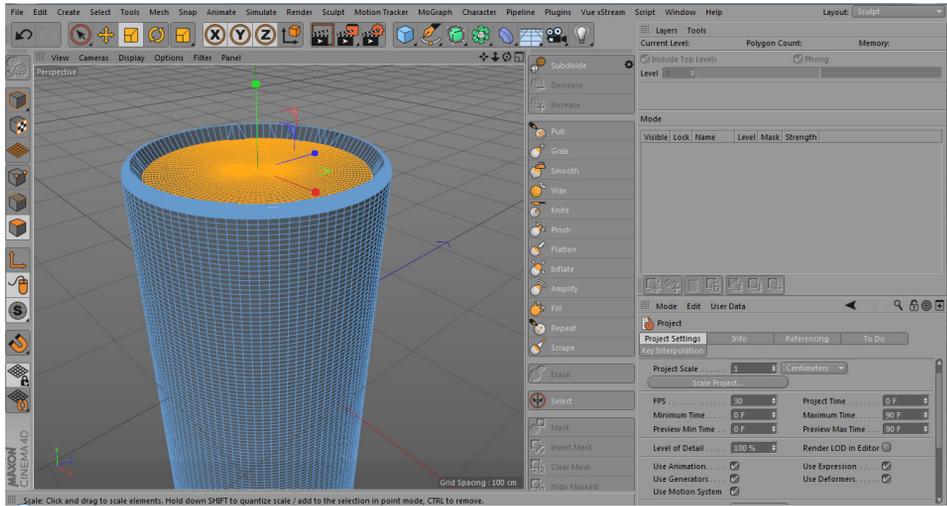


Figure 4-6 The Sculpt layout

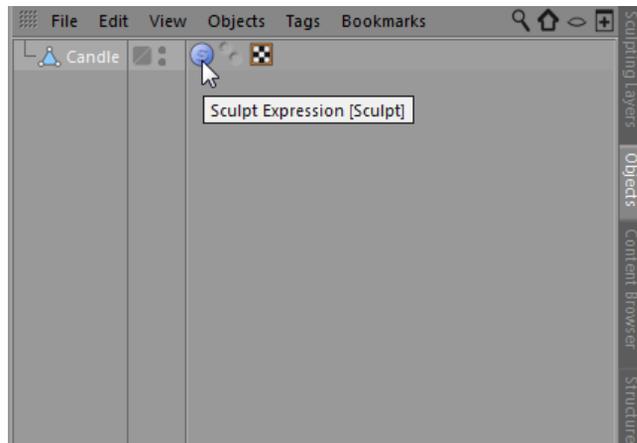


Figure 4-7 The Sculpt Expression [Sculpt] tag added to the Object Manager

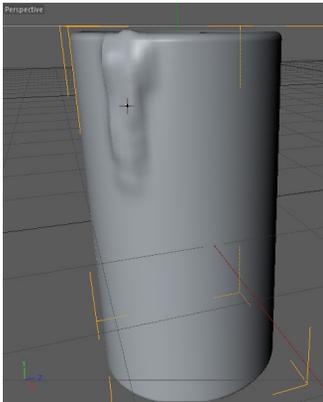


Figure 4-8 The strokes added

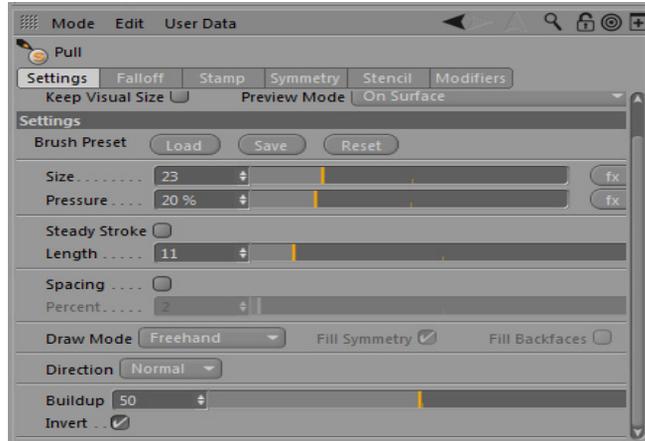


Figure 4-9 The **Invert** check box selected in the **Settings** area in the Attribute Manager

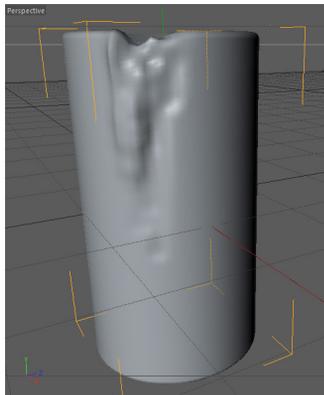


Figure 4-10 Strokes added to the Candle

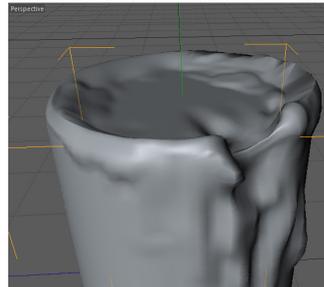


Figure 4-11 Strokes added on the top of Candle

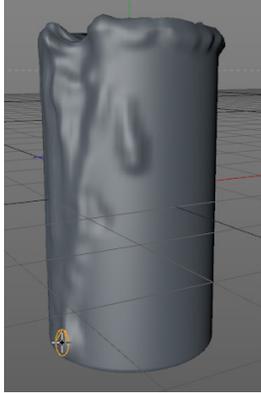


Figure 4-12 Adding strokes to the bottom of the Candle

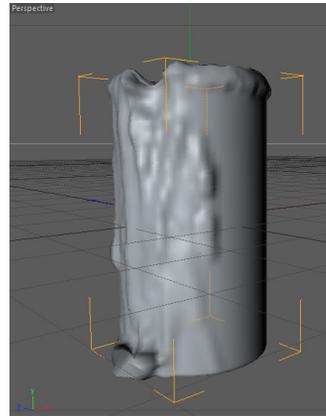


Figure 4-13 More strokes added to the bottom of the Candle

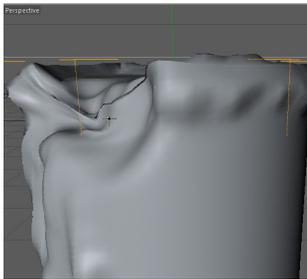


Figure 4-14 Adding strokes to the top of Candle

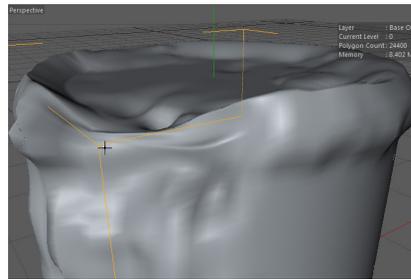


Figure 4-15 The smoothed surface of Candle

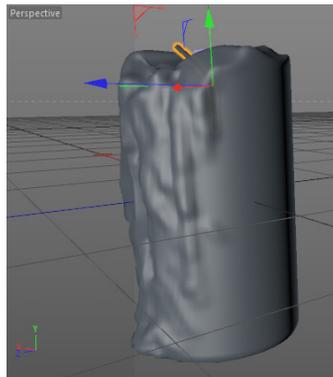


Figure 4-16 The Wick of the Candle

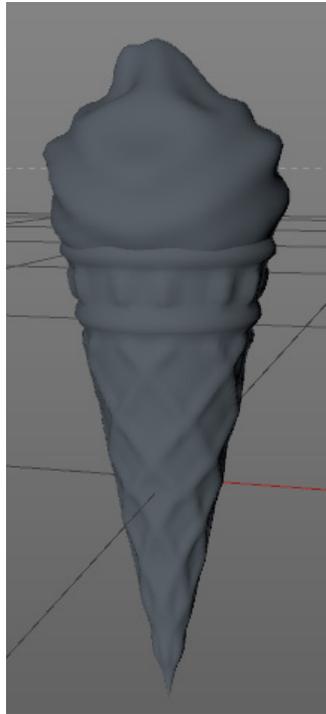


Figure 4-17 The ice cream cone

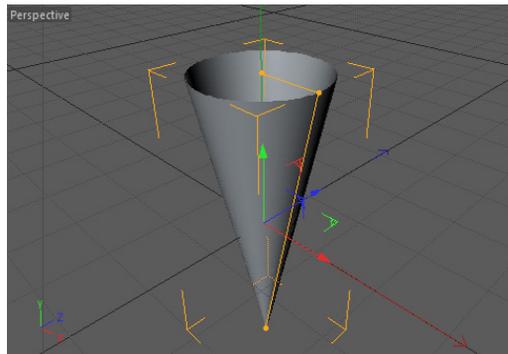


Figure 4-18 The Cone displayed in the Perspective viewport

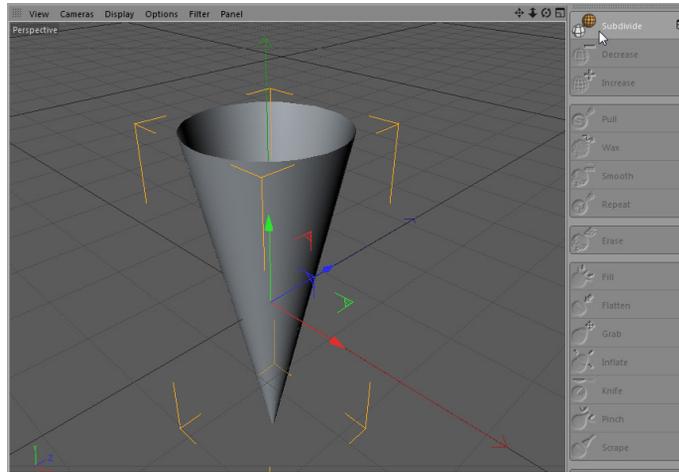


Figure 4-19 Choosing the **Subdivide** tool from the **Sculpting** menu

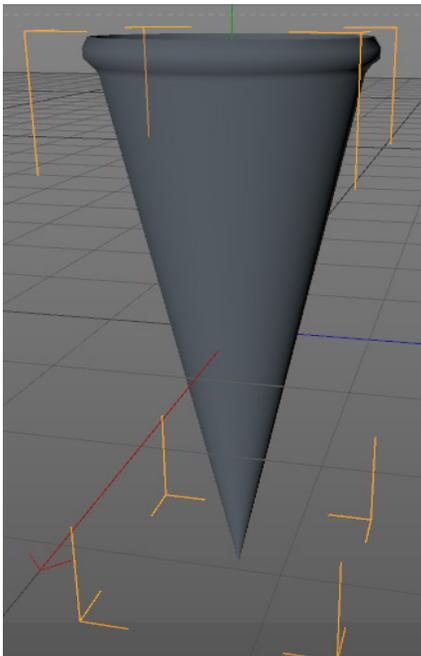


Figure 4-20 Applying strokes on the top of the Cone

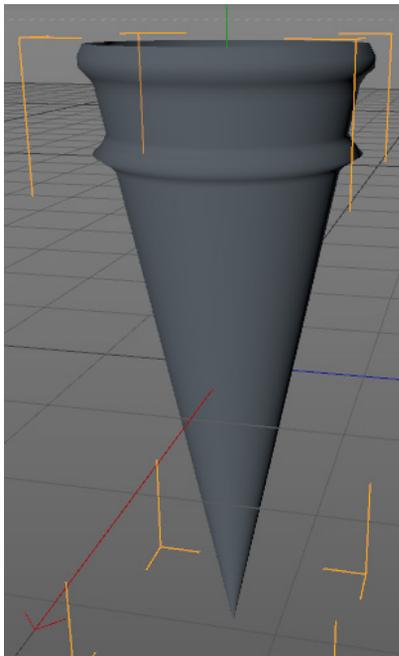


Figure 4-21 The strokes added

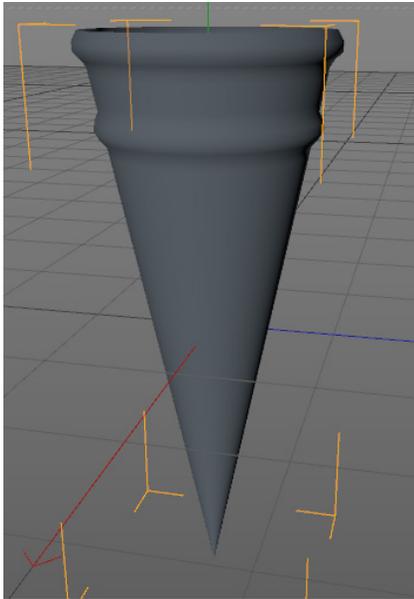


Figure 4-22 Cone smoothed using the **Smooth** tool

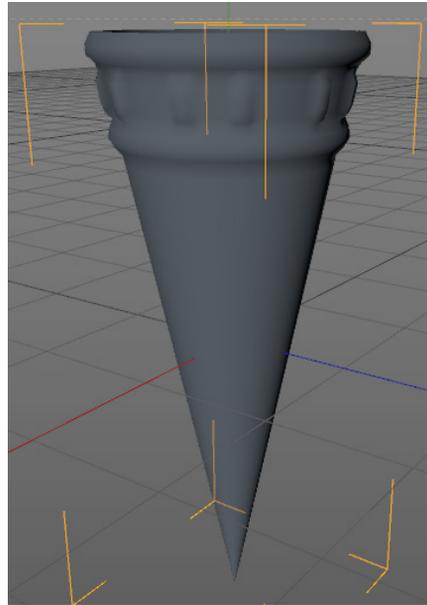


Figure 4-23 Creating a pattern on Cone in the Perspective viewport

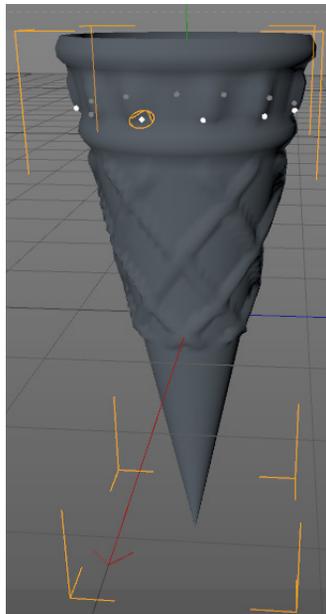


Figure 4-24 Creating a pattern on Cone using the **Inflate** tool

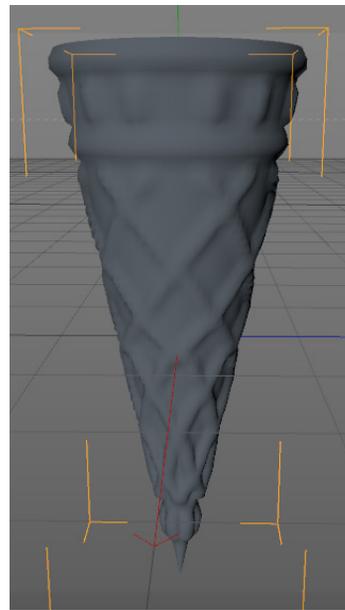


Figure 4-25 The pattern displayed on Cone

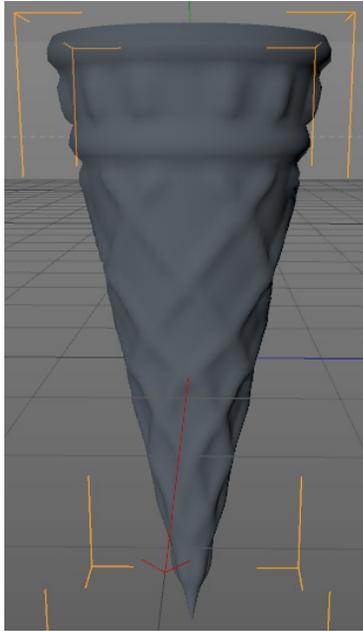


Figure 4-26 Smoothing the surface of Cone using the **Smooth** tool

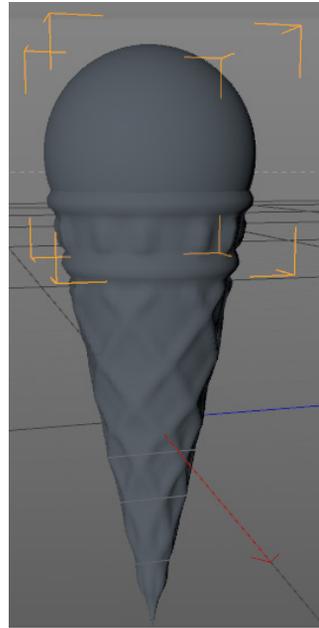


Figure 4-27 The Scoop displayed in the Perspective viewport



Figure 4-28 Adding strokes on the Scoop in the Perspective viewport

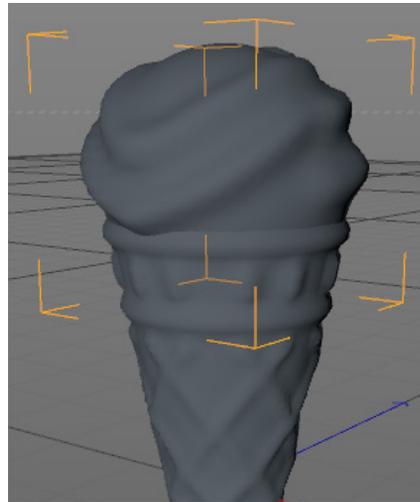


Figure 4-29 Adding stroke on Scoop using the **Pull** tool

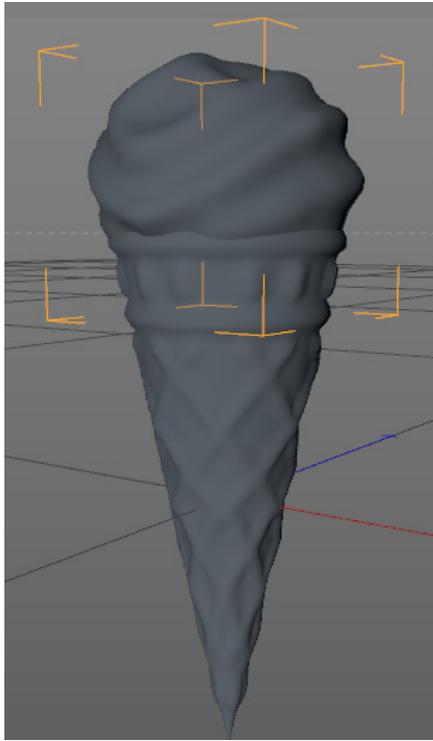


Figure 4-30 *Creating the pattern on Scoop in the Perspective viewport*

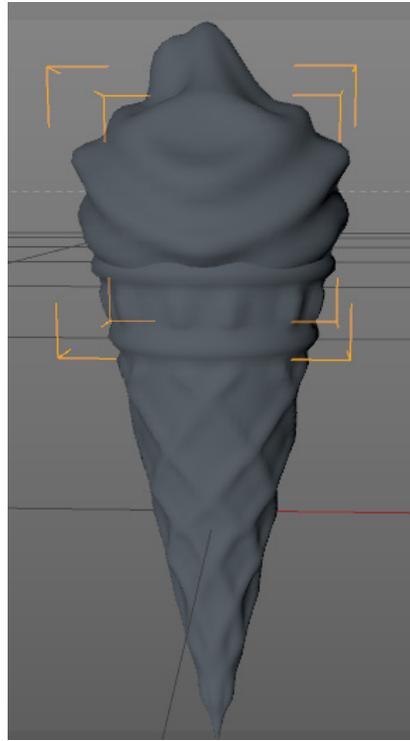


Figure 4-31 *The peak of Scoop created*

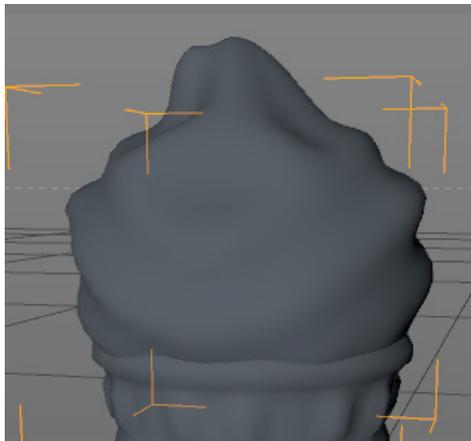


Figure 4-32 *The smooth peak of the Scoop in the Perspective viewport*



Figure 4-33 A barrel with cracks

Chapter 5

Texturing

Learning Objectives

After completing this chapter, you will be able to:

- *Work with the Material Manager*
- *Use shaders*
- *Apply textures and colors to the objects*



Figure 5-1 The textured model of a dice

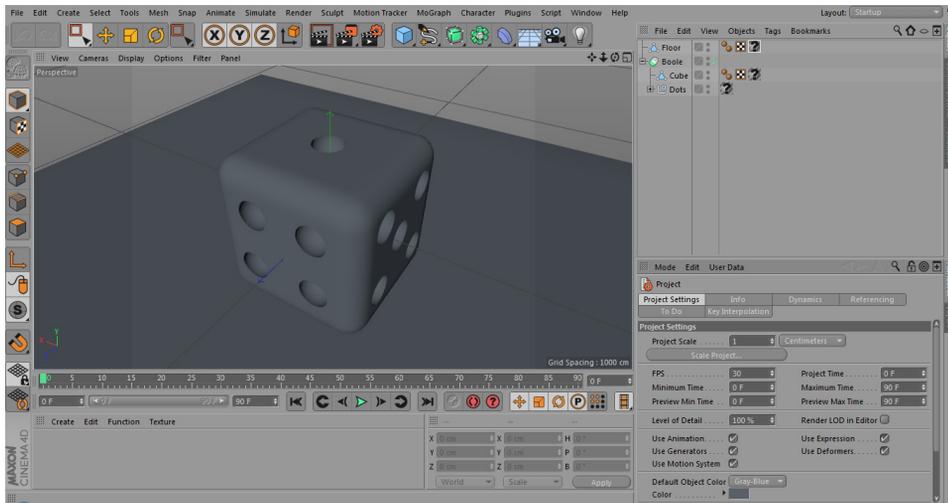


Figure 5-2 The c05_tut1_start.c4d file

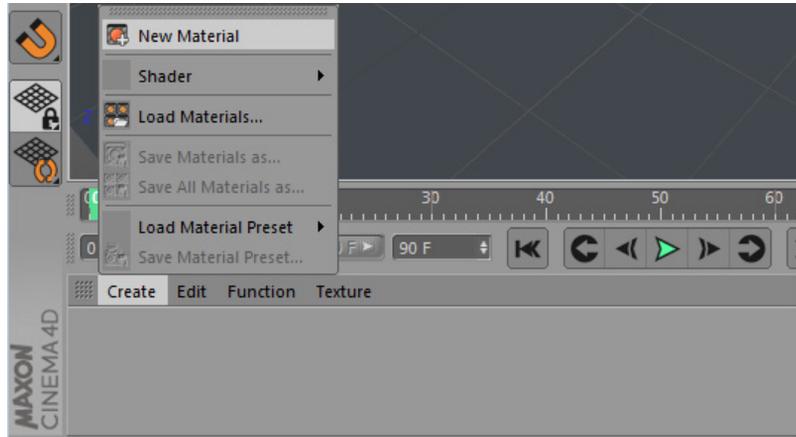


Figure 5-3 Choosing **New Material** from the Material Manager menu

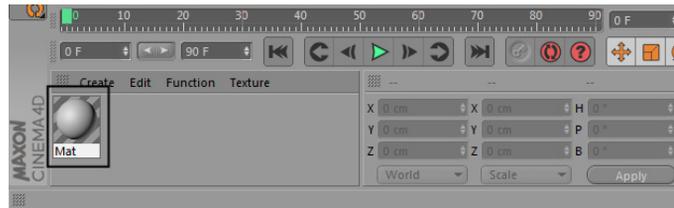


Figure 5-4 Displaying the material slot in the Material Manager

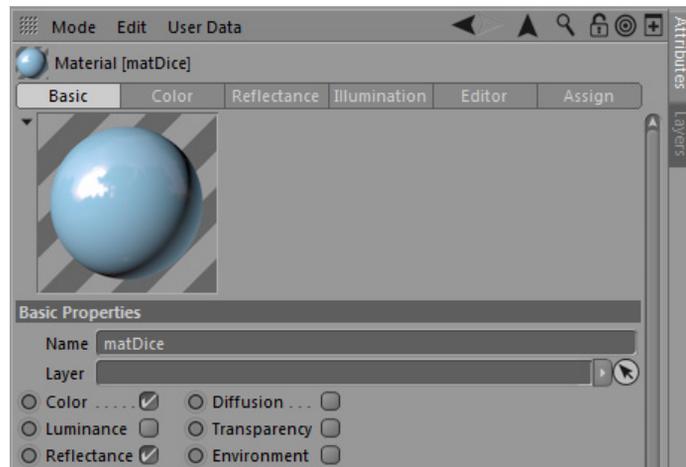


Figure 5-5 The **Reflectance** check box selected

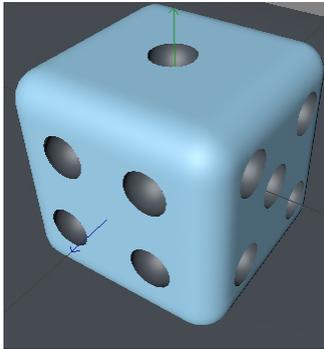


Figure 5-6 The matDice material applied to Cube

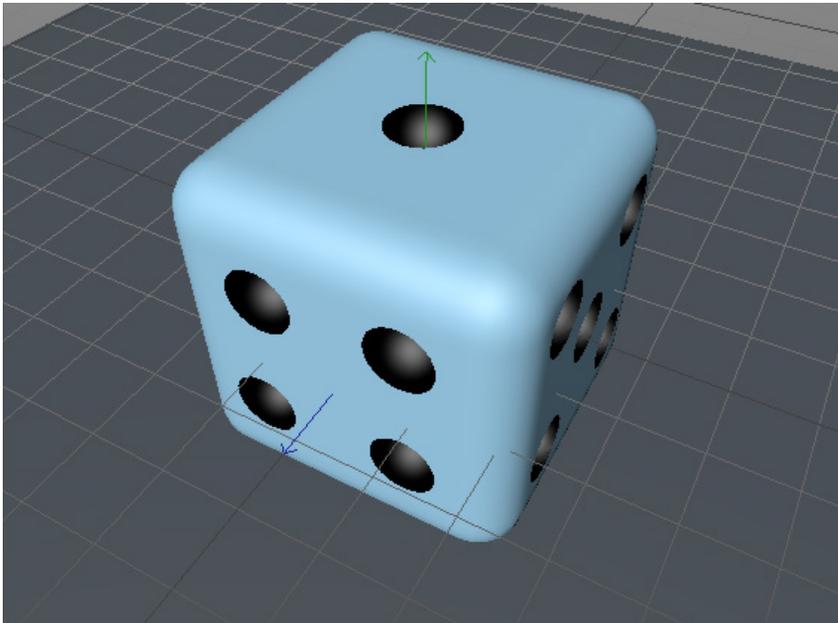


Figure 5-7 The Dot material applied to dots of the Cube

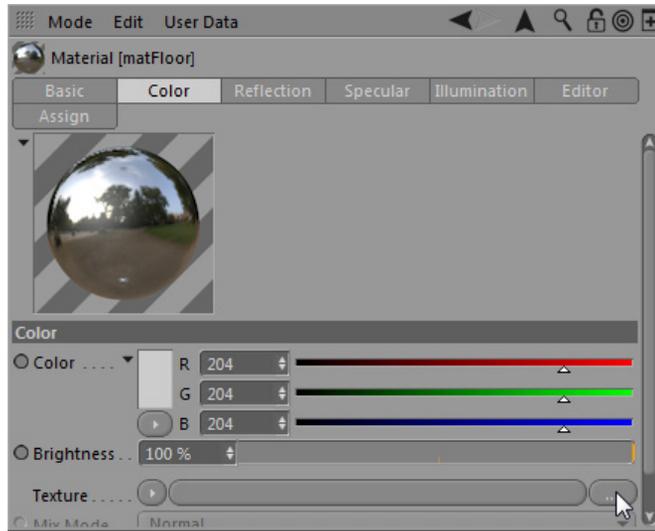


Figure 5-8 Choosing the browse button

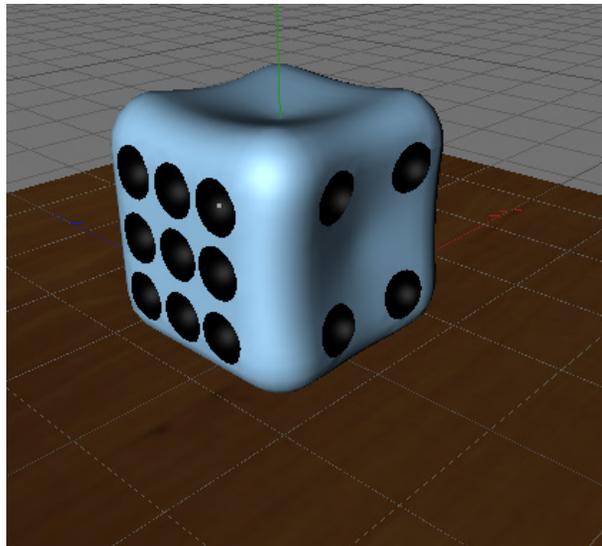


Figure 5-9 The matFloor applied to Floor



Figure 5-10 The textured dining table set

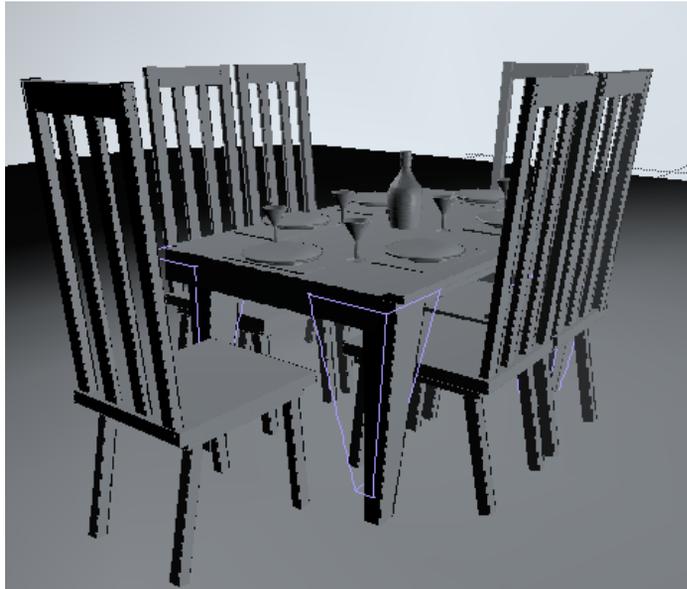


Figure 5-11 The c05_tut2_start.c4d file

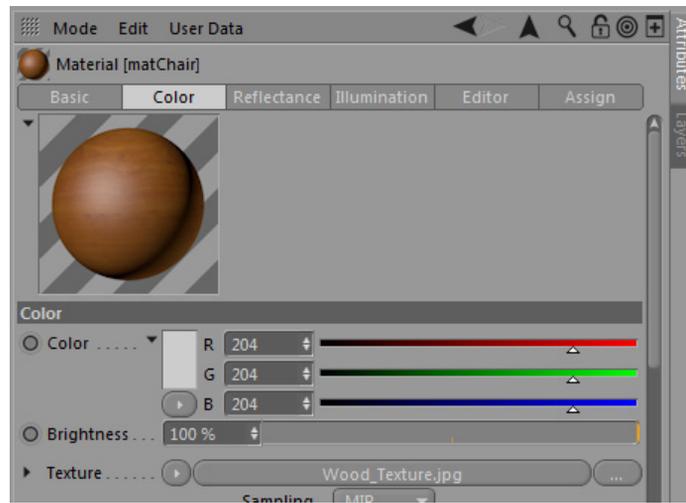


Figure 5-12 The `Wood_Texture.jpg` added to the **Color** area of Attribute Manager

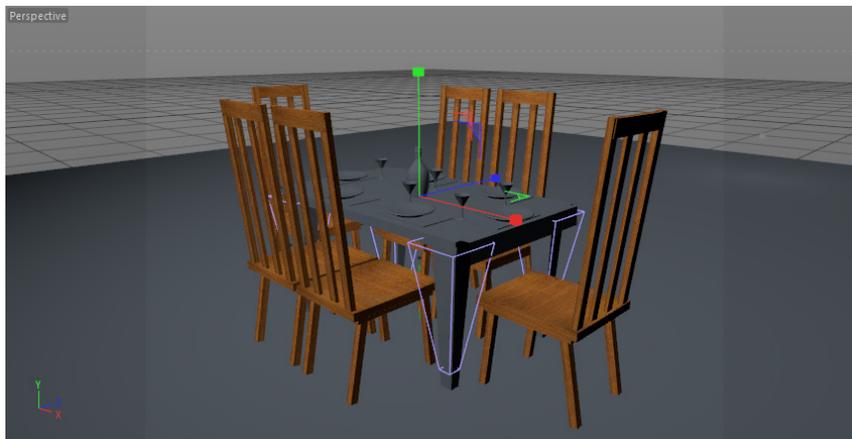


Figure 5-13 The `matChair` applied to the chairs

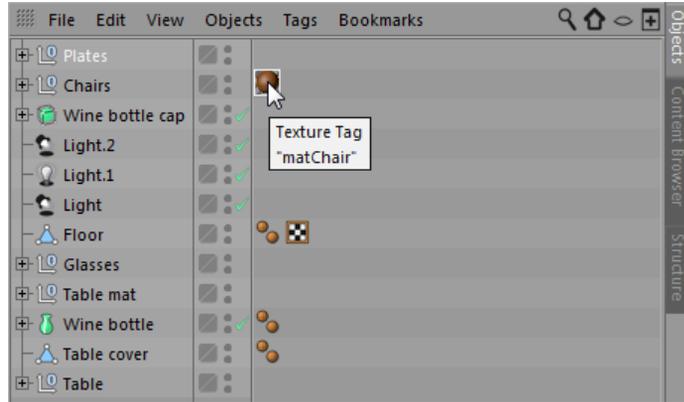


Figure 5-14 The Texture Tag “matChair” in the Object Manager

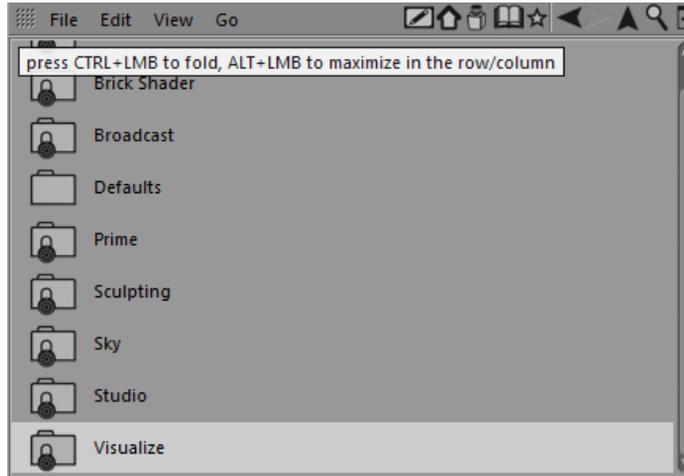


Figure 5-15 Choosing the Visualize folder in the Content Browser

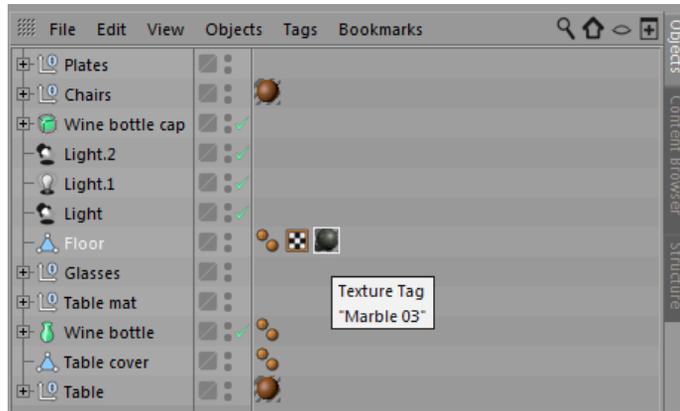


Figure 5-16 The Texture Tag “Marble 03” selected in the Object Manager

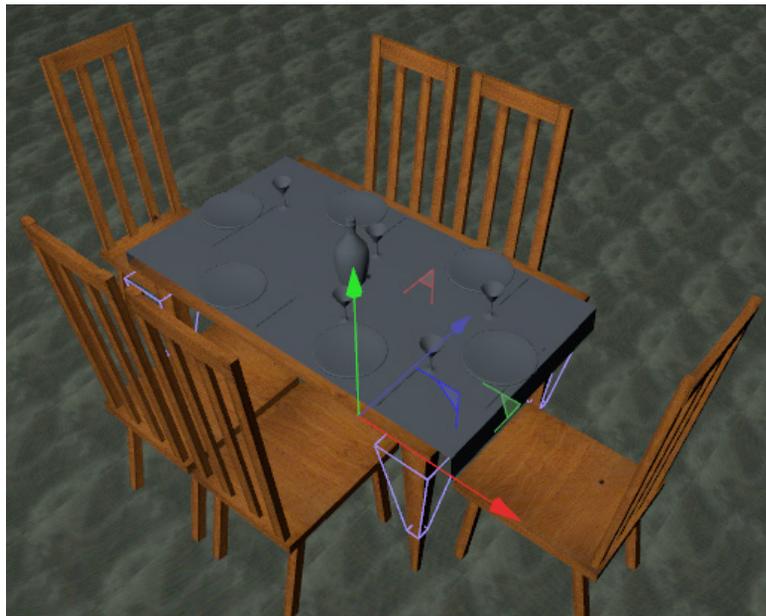


Figure 5-17 The Marble 03 texture uniformly projected on the Floor

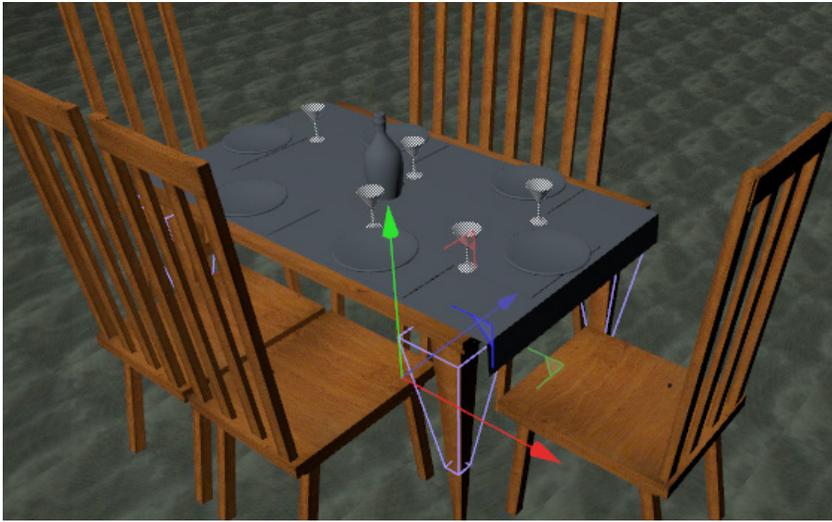


Figure 5-18 The matGlass material applied to the Glasses

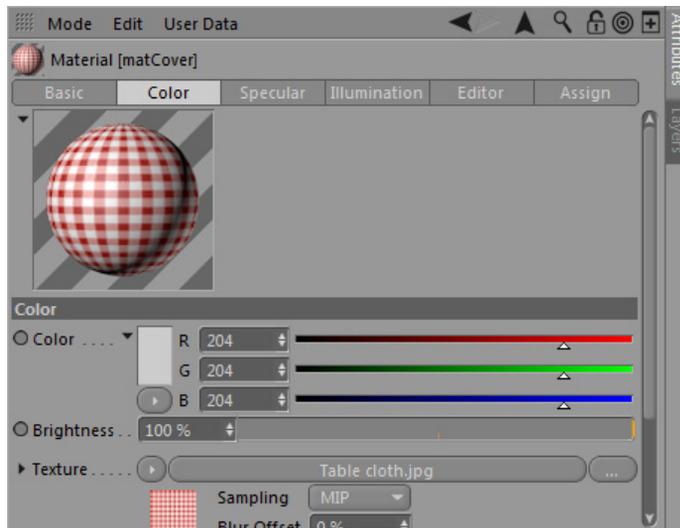


Figure 5-19 The matCover material applied to the material slot

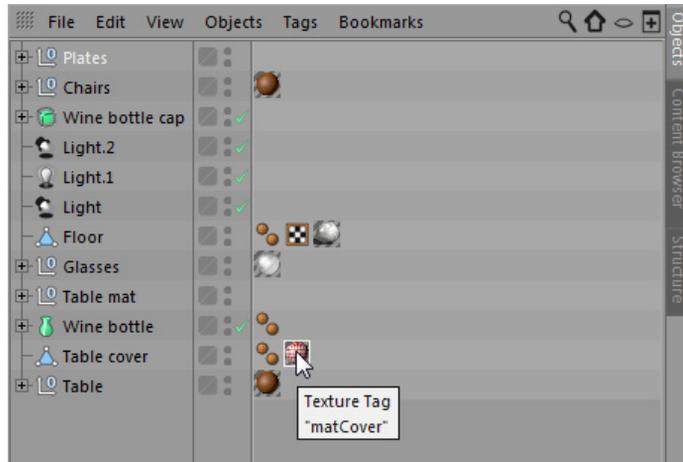


Figure 5-20 The Texture Tag “matCover” selected in the Object Manager

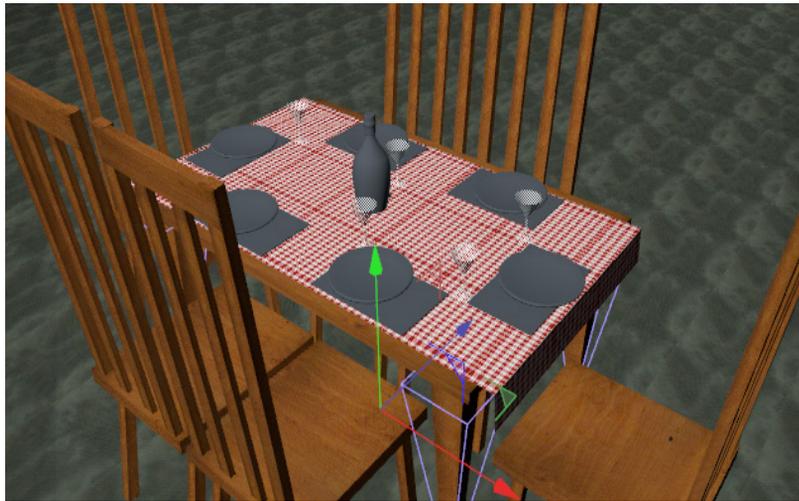


Figure 5-21 The matCover material applied to Table cover

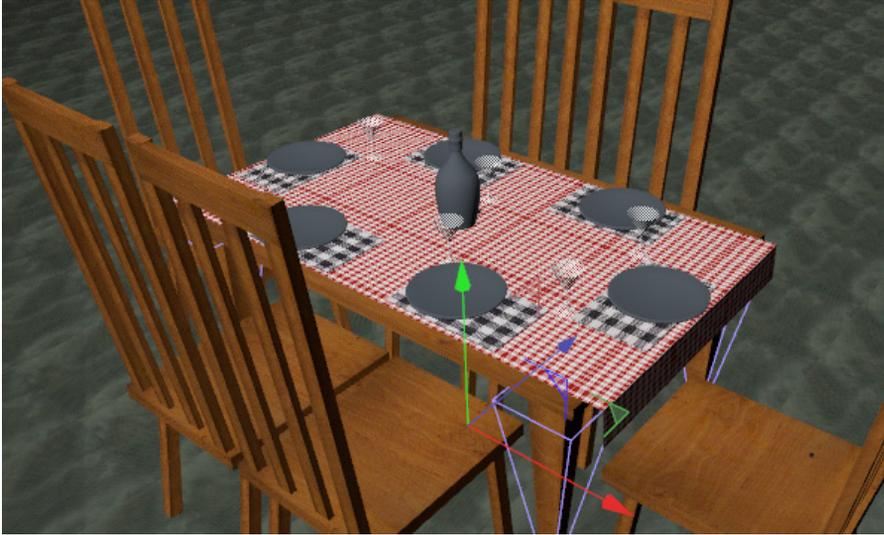


Figure 5-22 The matTableMats material applied to the Table mat group

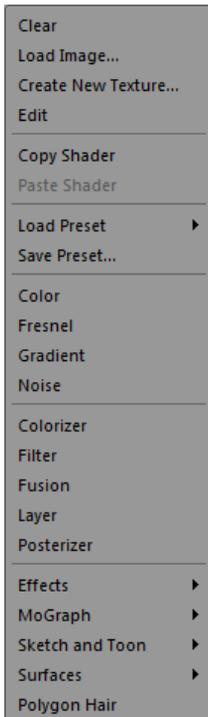


Figure 5-23 The flyout displayed on choosing the triangle button next to the **Texture** parameter

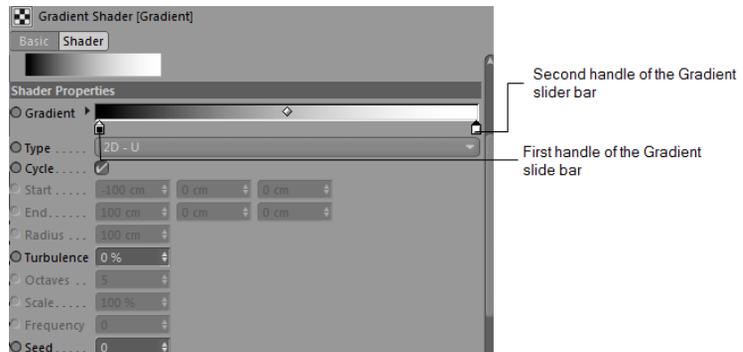


Figure 5-24 The **Shader Properties** area of **Gradient** in the Attribute Manager

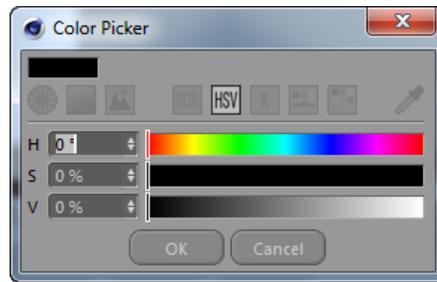


Figure 5-25 The Color Picker dialog box



Figure 5-26 The matWine material applied to Wine bottle

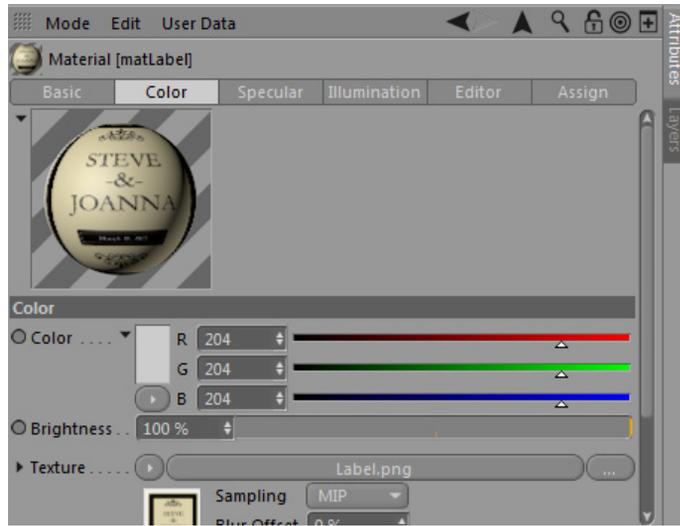


Figure 5-27 The matLabel texture displayed in the Color area of Material Manager

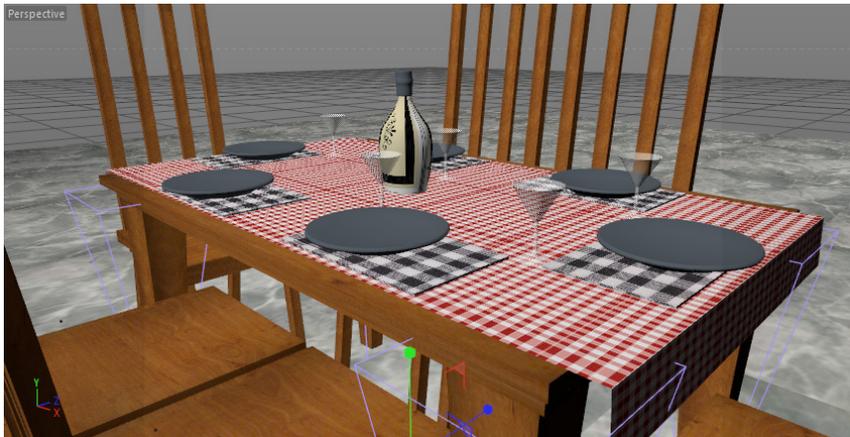


Figure 5-28 The matLabel texture applied to Wine bottle

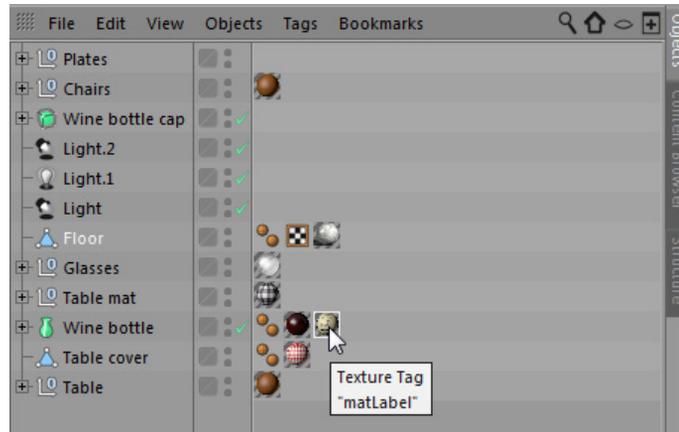


Figure 5-29 Selecting the *Texture Tag “matLabel”* in the Object Manager



Figure 5-30 The *matLabel* material *Figure 5-31* The *matCap* material projected properly on the wine bottle applied to the Wine bottle cap in the Perspective viewport



Figure 5-32 The matPlates Material applied to Plate.1



Figure 5-33 The camera model



Figure 5-34 The final output

Chapter 6

Lighting

Learning Objectives

After completing this chapter, you will be able to:

- *Add lights to a scene*
- *Illuminate a scene*
- *Add Physical Sky to a scene*



Figure 6-1 The torchlight

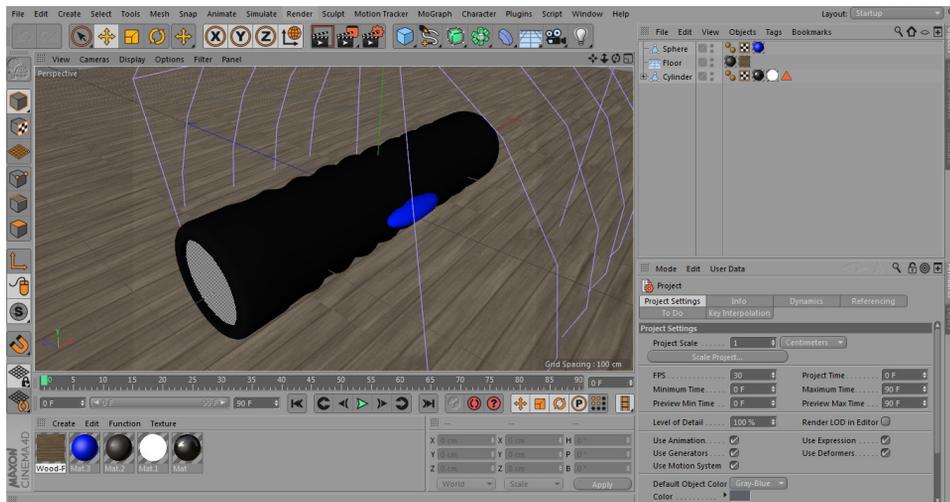


Figure 6-2 The c06_tut1_start.c4d file

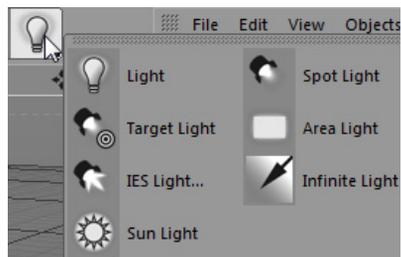


Figure 6-3 The flyout displayed with various tools

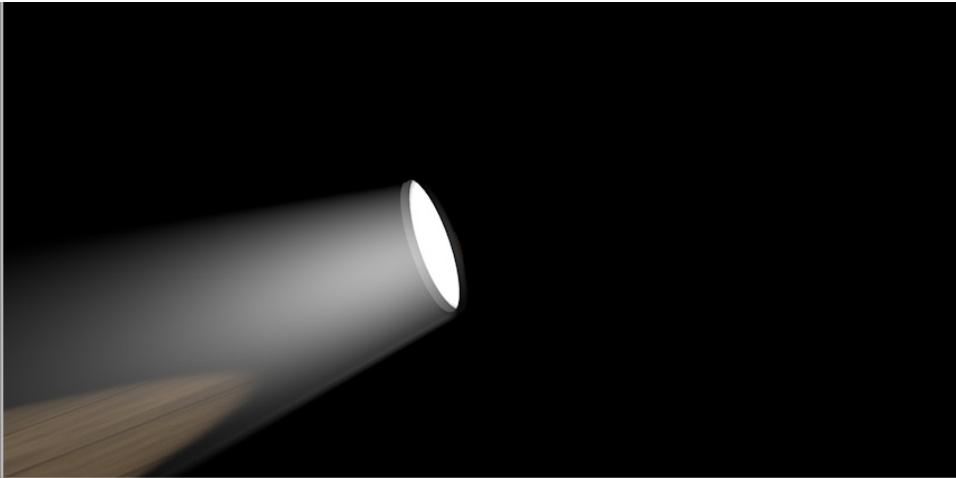


Figure 6-4 The rendered view of the Perspective viewport

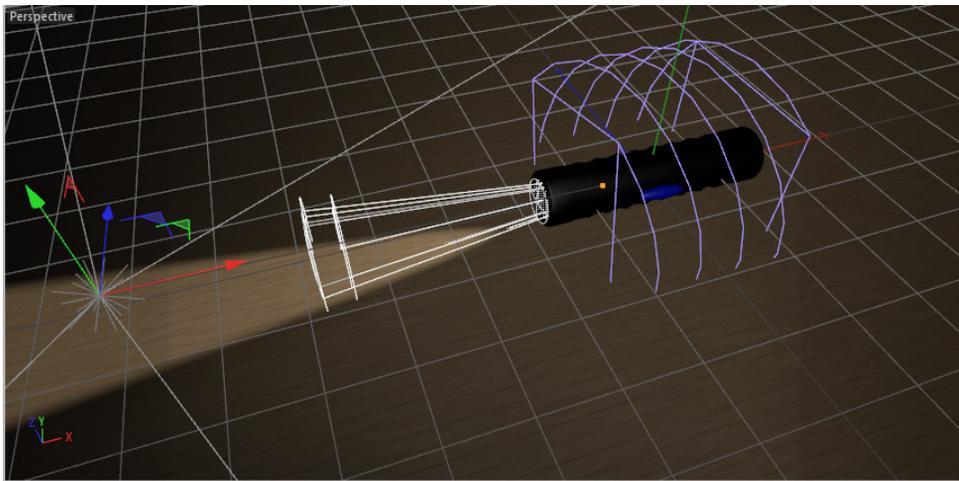


Figure 6-5 Light.1 displayed in the Perspective viewport



Figure 6-6 The illuminated night scene

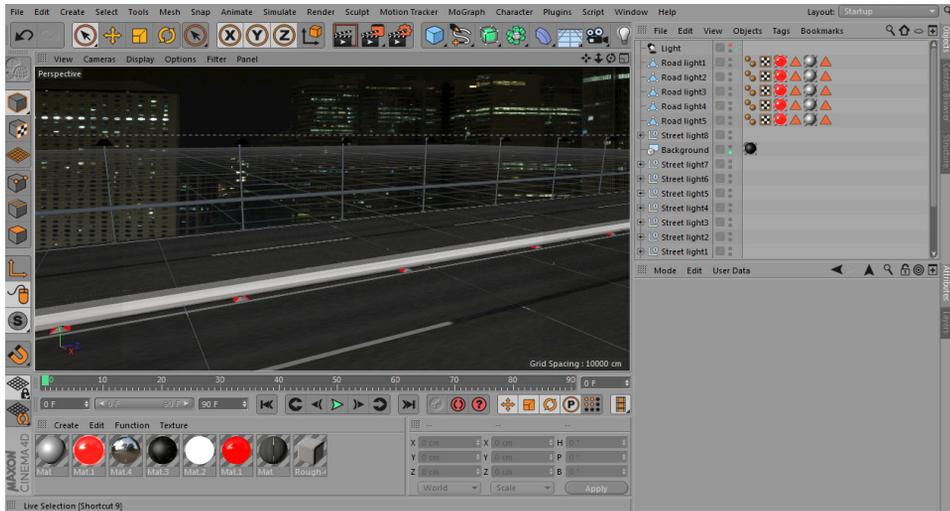


Figure 6-7 The c06_tut2_start.c4d file

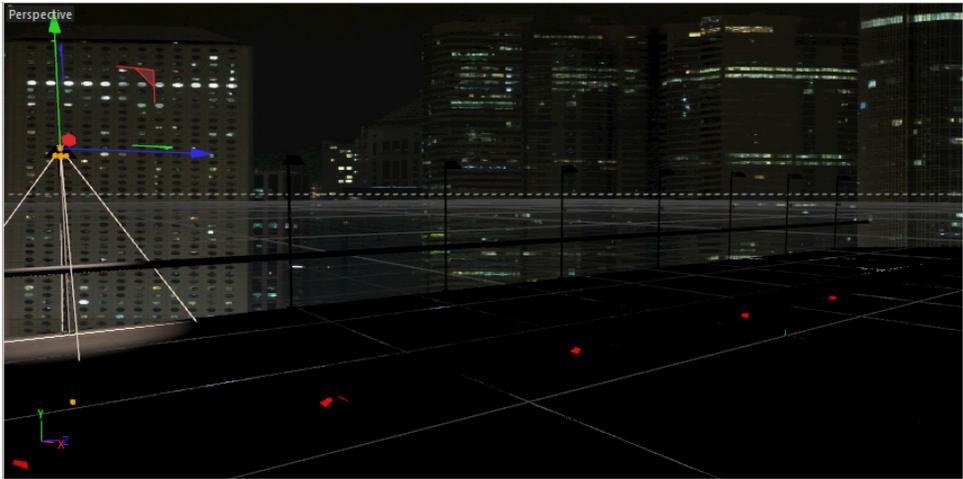


Figure 6-8 Light positioned in the scene

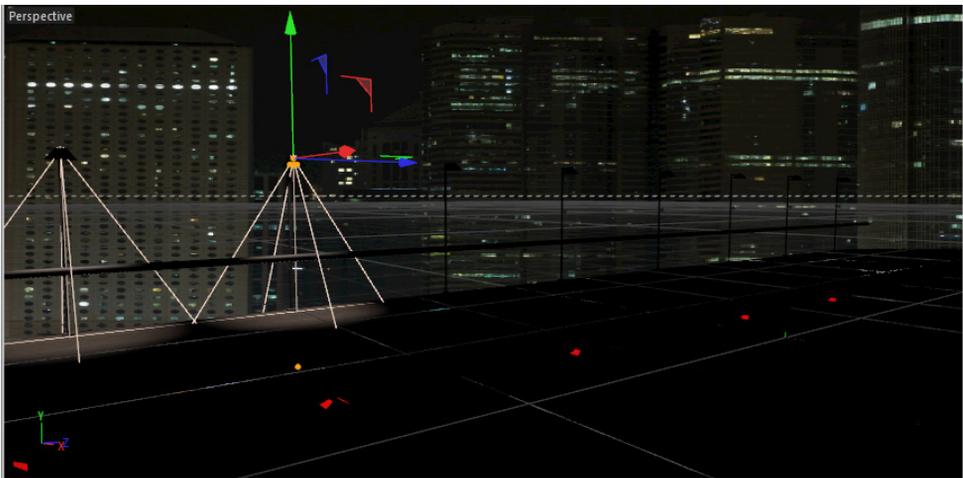


Figure 6-9 Light.1 positioned in the scene

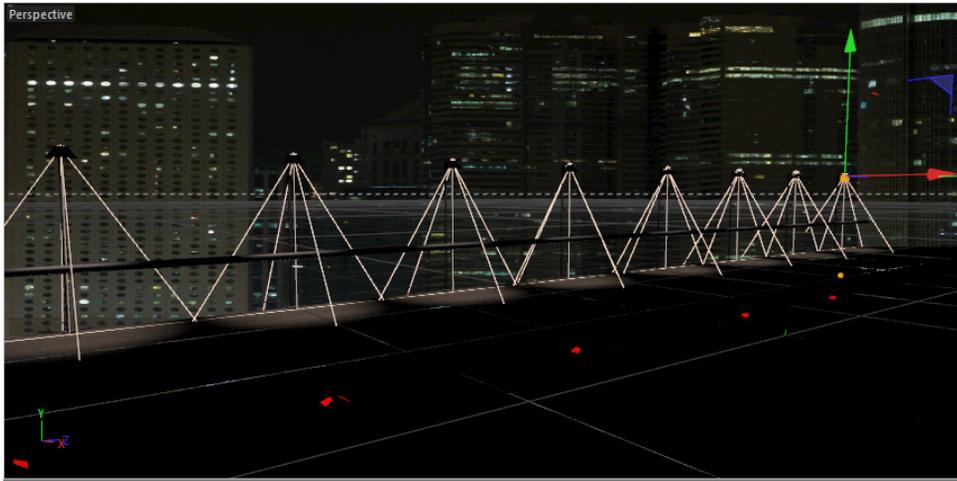


Figure 6-10 Lights positioned in the Perspective viewport

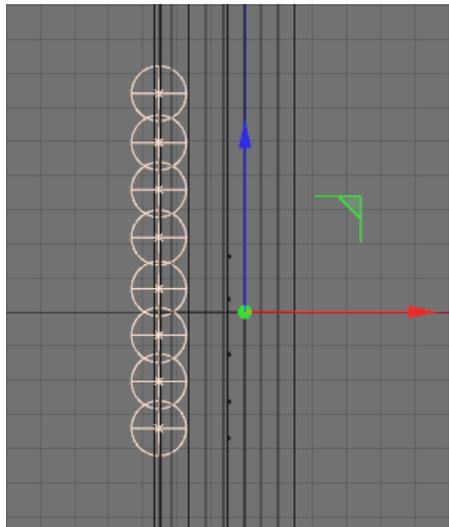


Figure 6-11 Light.8 created in the Top viewport



Figure 6-12 Light.8 positioned in the scene



Figure 6-13 The light house

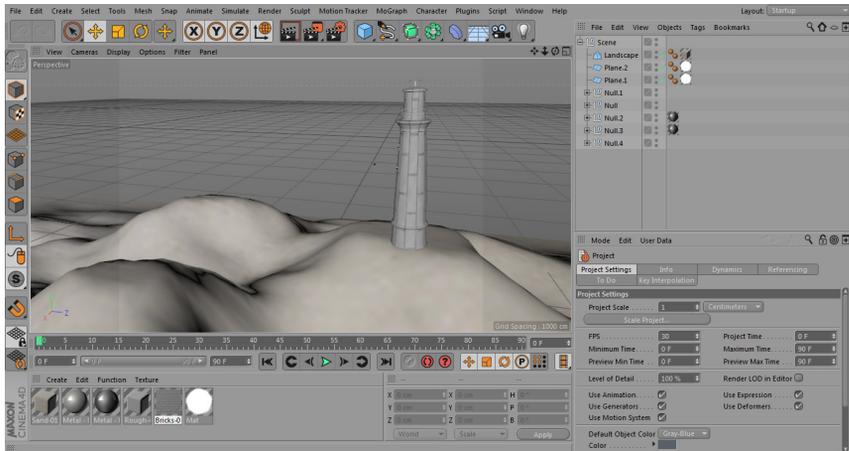


Figure 6-14 The `c06_tut3_start.c4d` file

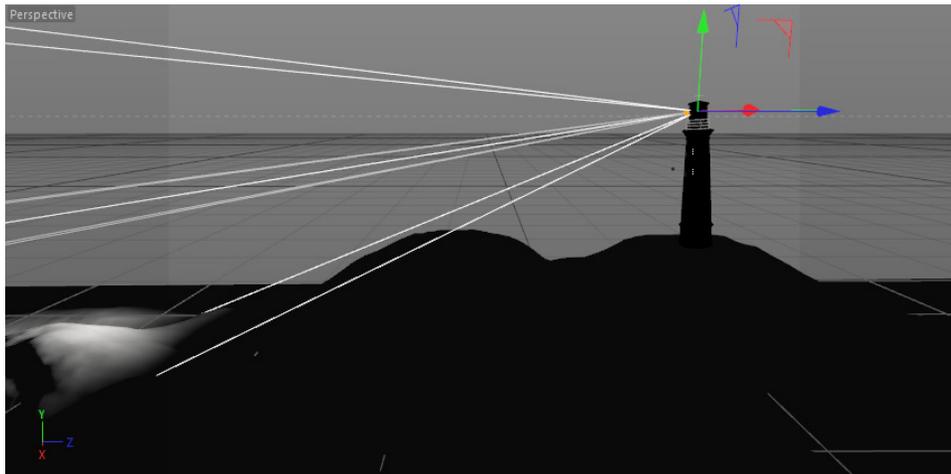


Figure 6-15 The spot light positioned in the Perspective viewport

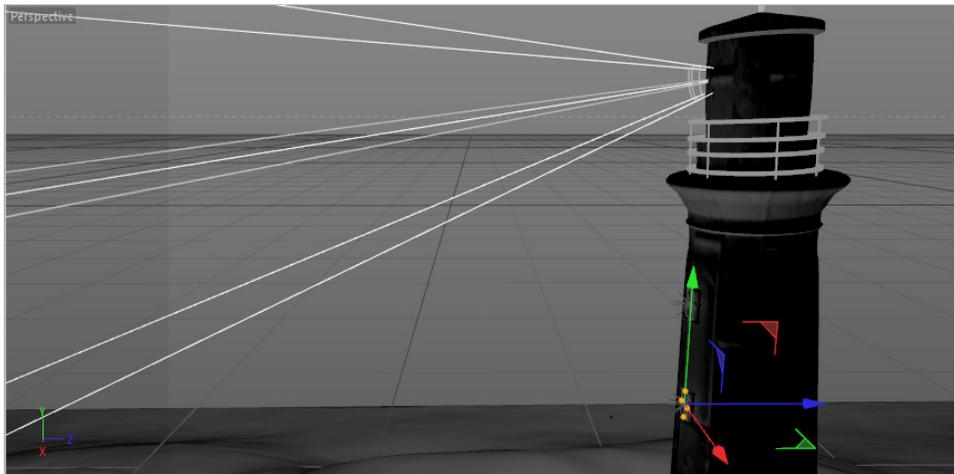


Figure 6-16 The Area lights positioned in the Perspective viewport

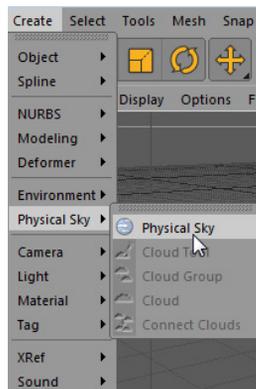


Figure 6-17 Choosing **Physical Sky** from the main menu



Figure 6-18 Physical Sky added to the Object Manager

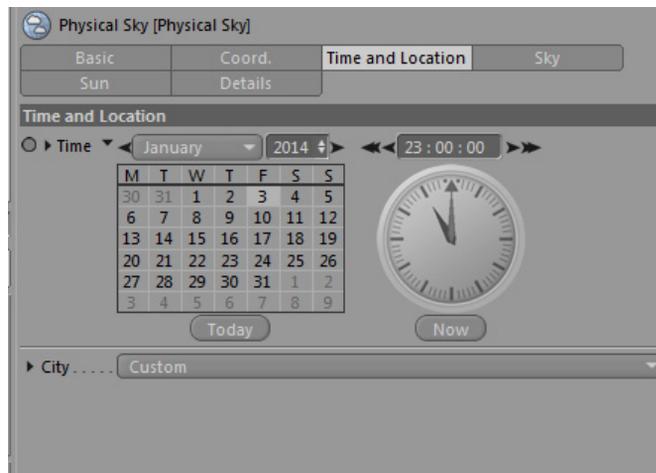


Figure 6-19 The Time and Location area



Figure 6-20 The living room scene



Figure 6-21 The scene after adding lights to it

Chapter 7

Rigging

Learning Objectives

After completing this chapter, you will be able to:

- *Understand the concept of rigging*
- *Apply constraints*

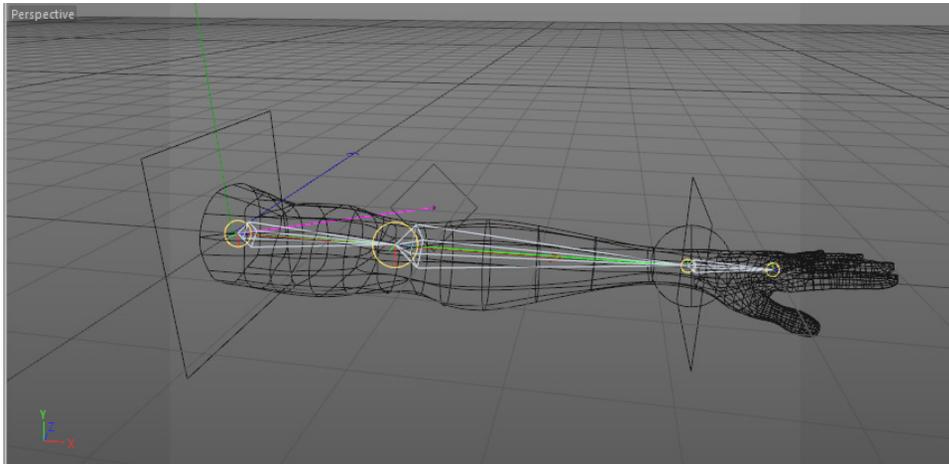


Figure 7-1 The rig of the hand

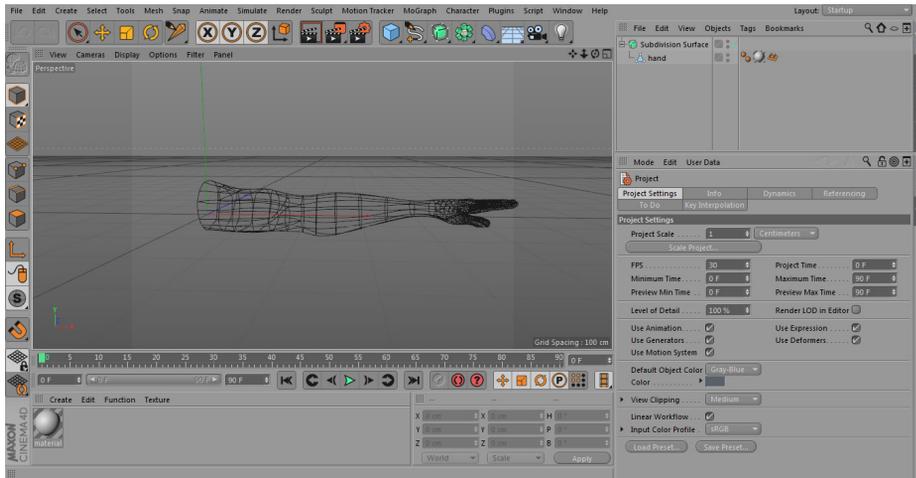


Figure 7-2 The c07_tut1_start file

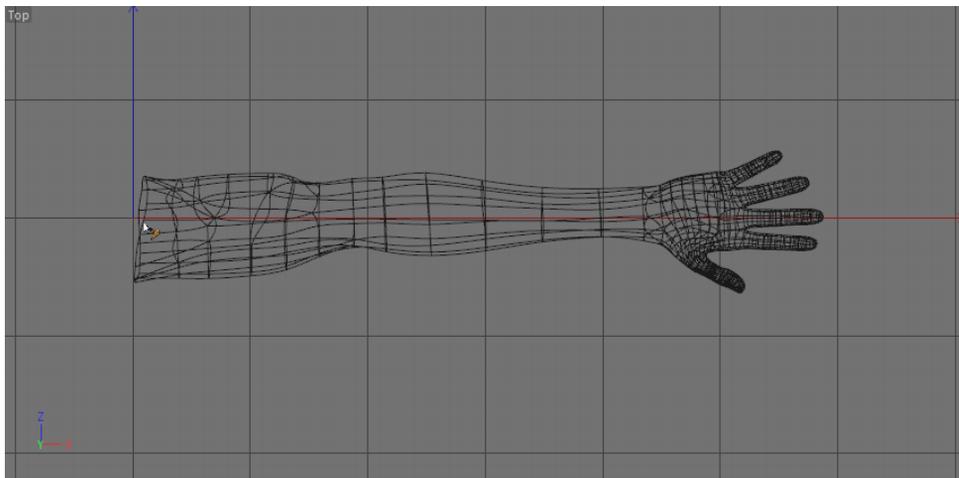


Figure 7-3 Clicking on the shoulder joint of the hand

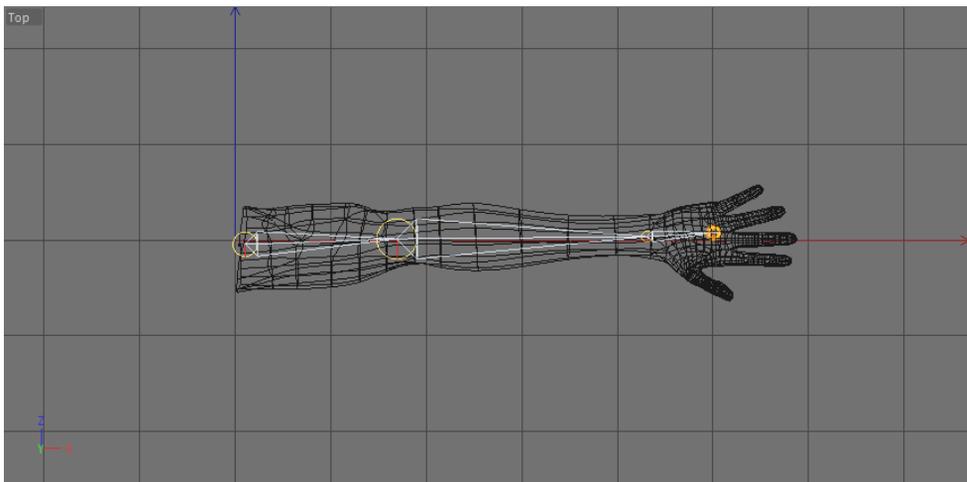


Figure 7-4 Bone structure created

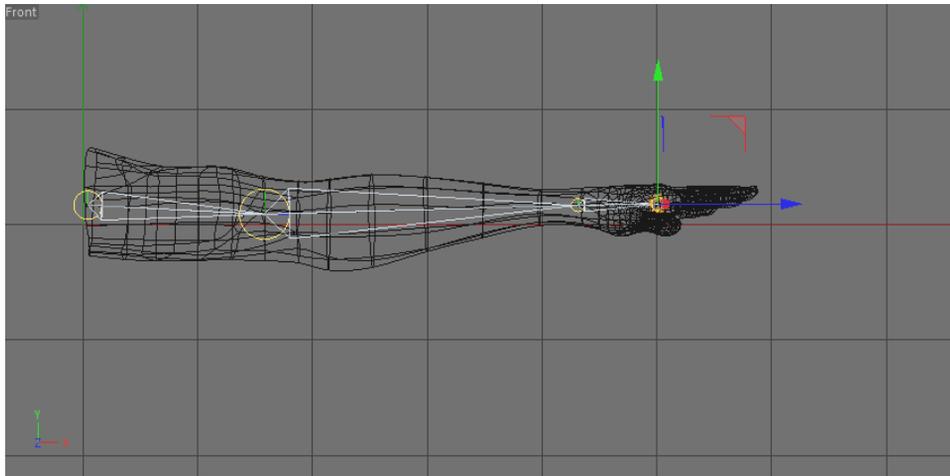


Figure 7-5 All joints aligned in the Front viewport

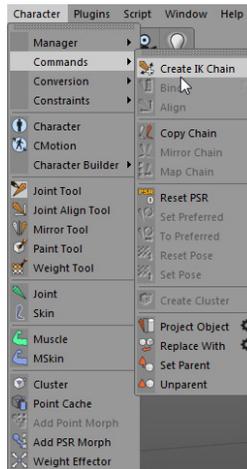


Figure 7-6 Choosing the Create IK Chain from the main menu

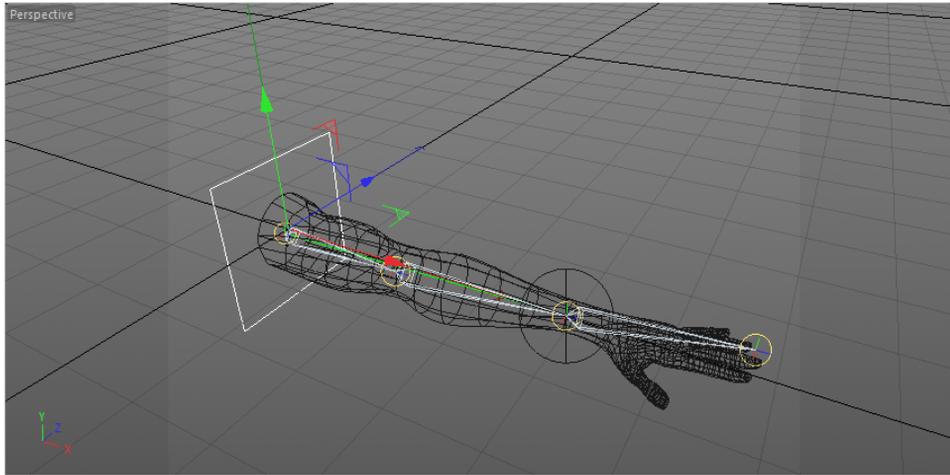


Figure 7-9 The shoulder control in the Perspective viewport

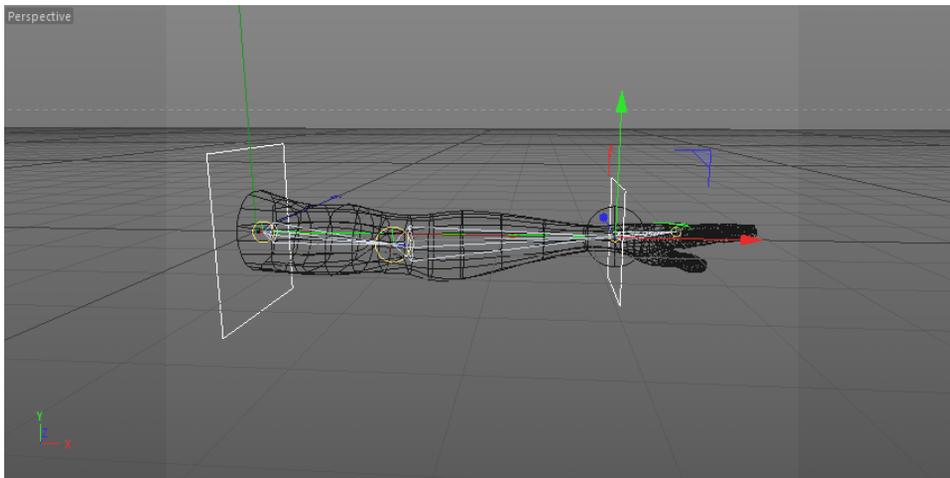


Figure 7-10 Displaying the controllers of hand

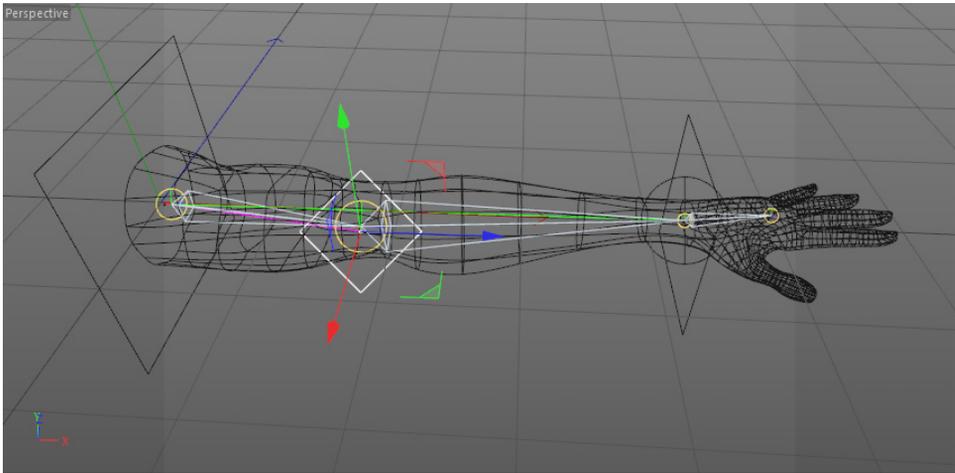


Figure 7-11 The changed icon of shoulder_joint.Pole

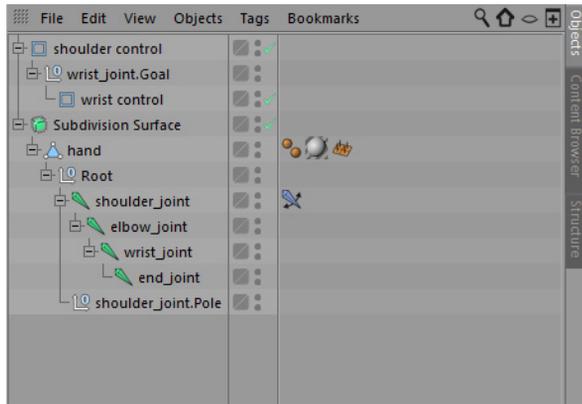


Figure 7-12 Hierarchy for controls in the Object Manager

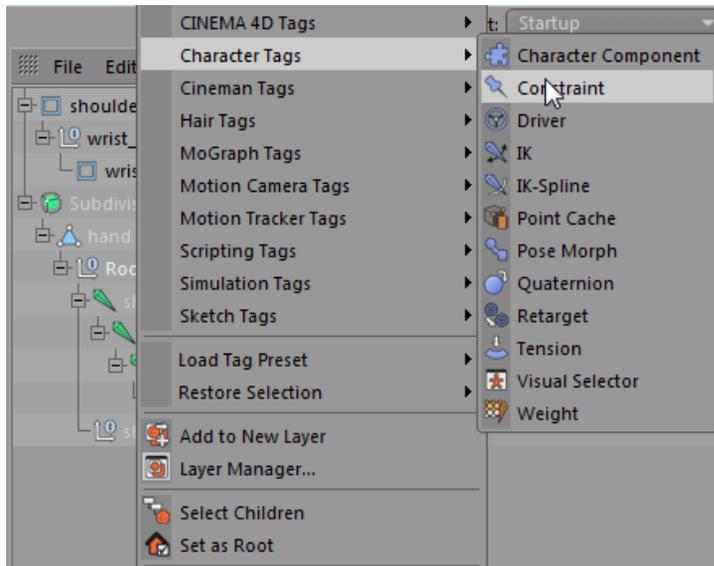


Figure 7-13 Choosing **Constraint** from the shortcut menu

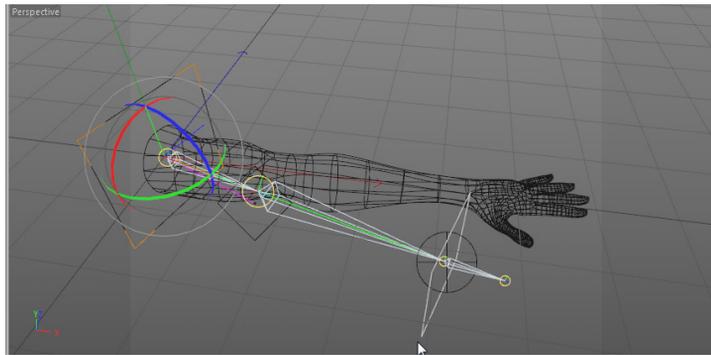


Figure 7-14 All joints and controls rotating along with shoulder control in the Perspective viewport

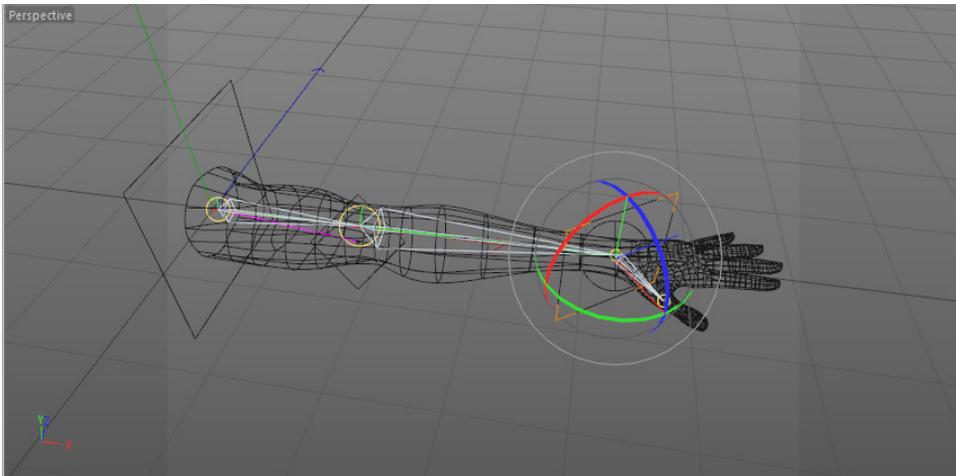


Figure 7-15 The wrist_joint and end_joint rotating along with wrist control

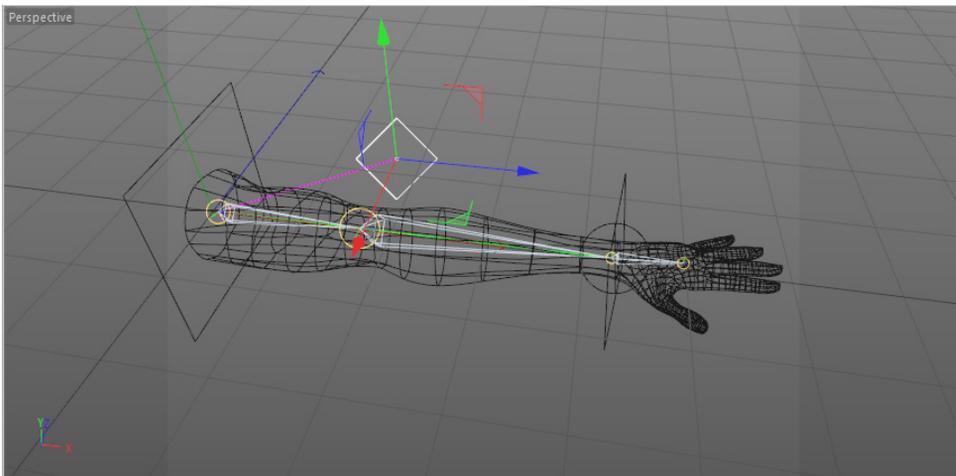


Figure 7-16 Position of shoulder_joint. Pole changed

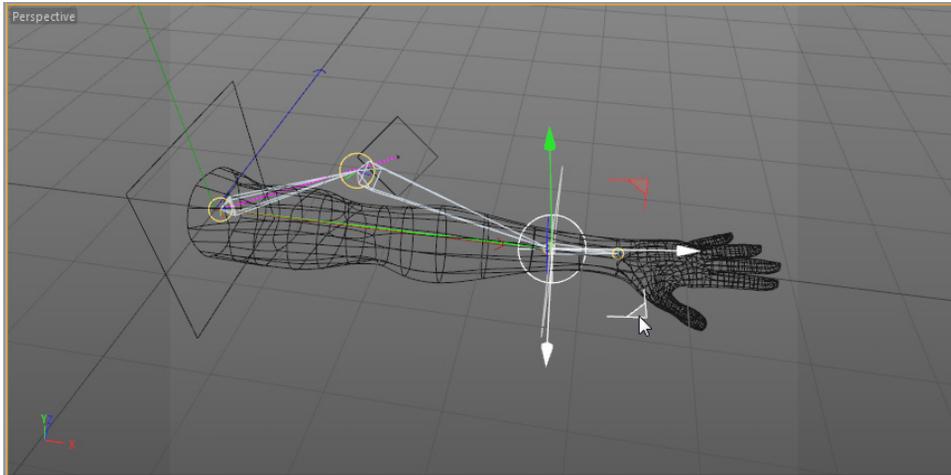


Figure 7-17 Elbow movement controlled by wrist_joint.Goal

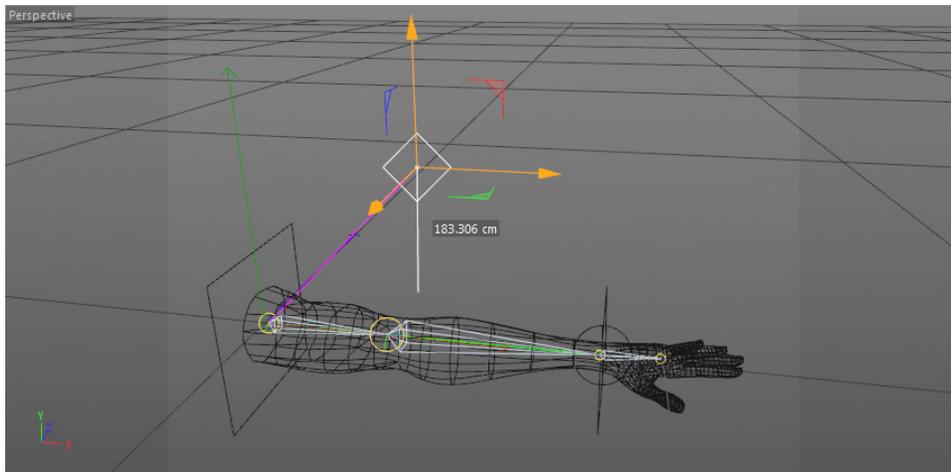


Figure 7-18 Elbow rotation controlled by shoulder_joint.Pole

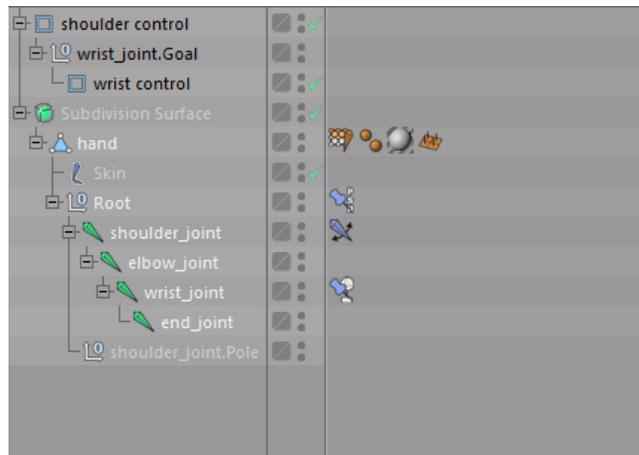


Figure 7-19 Skin added in the Object Manager

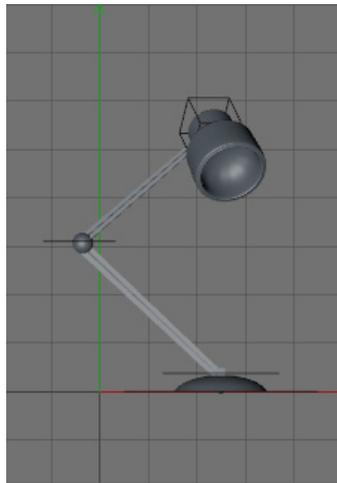


Figure 7-20 Rig for a table lamp

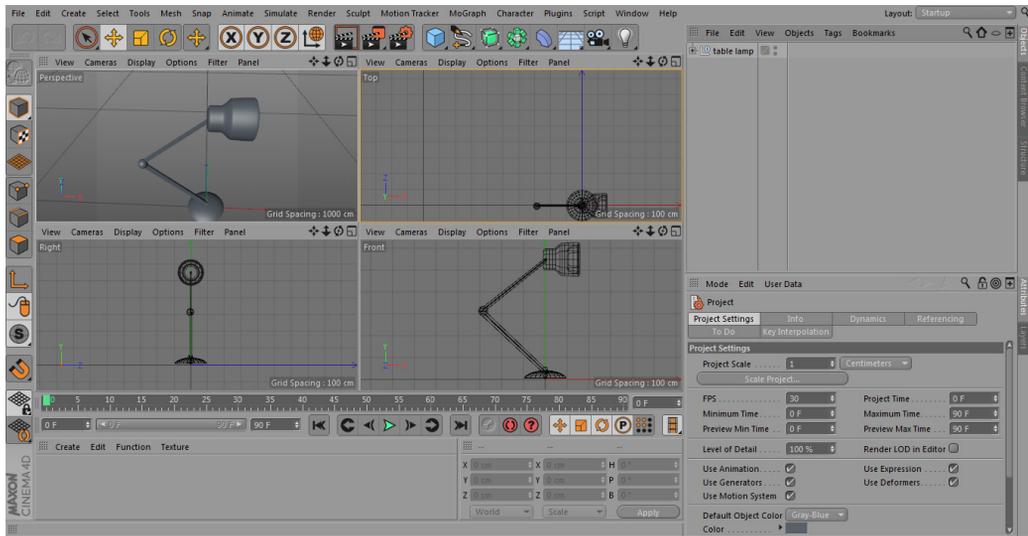


Figure 7-21 The c07_tut2_start file

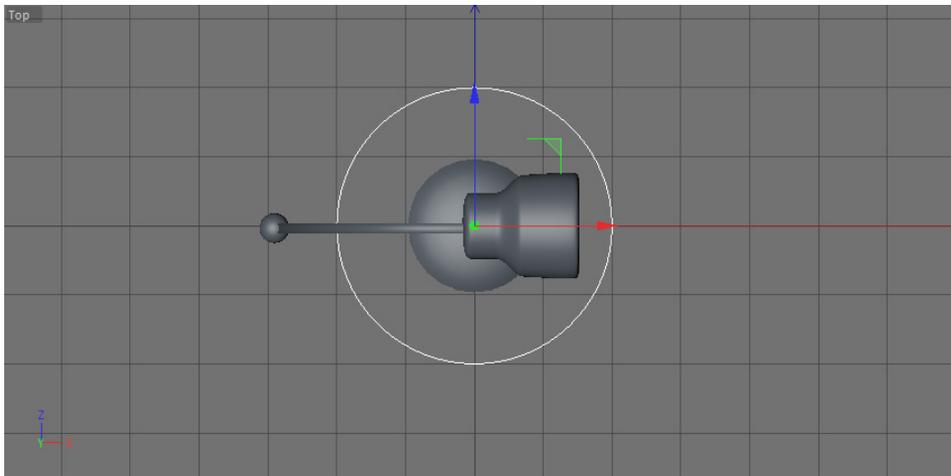


Figure 7-22 The main control in the Top viewport

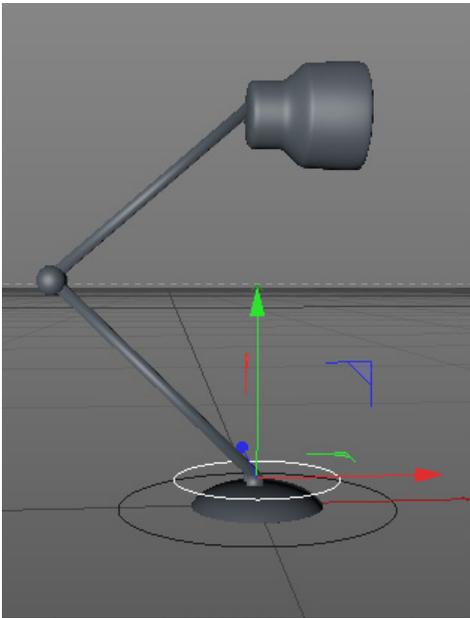


Figure 7-23 The support control in the Perspective viewport

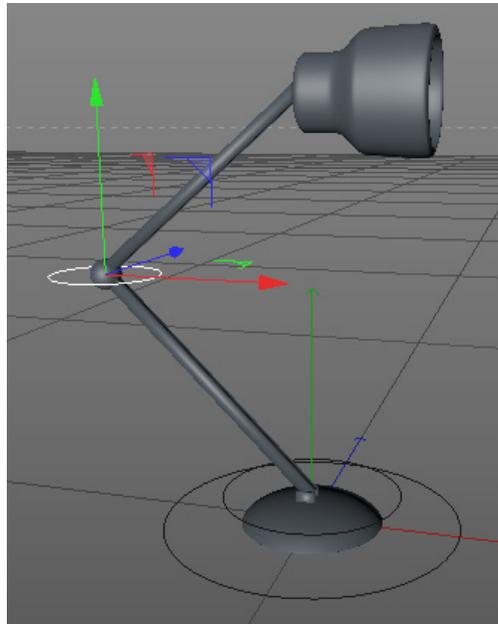


Figure 7-24 The center control in the Perspective viewport

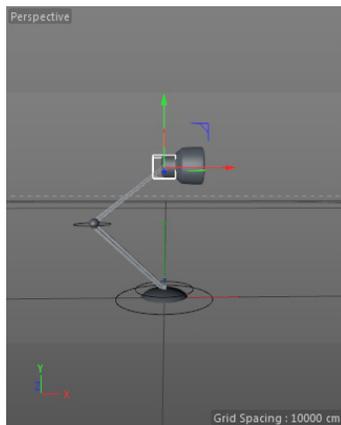


Figure 7-25 The lamp control in the Perspective viewport

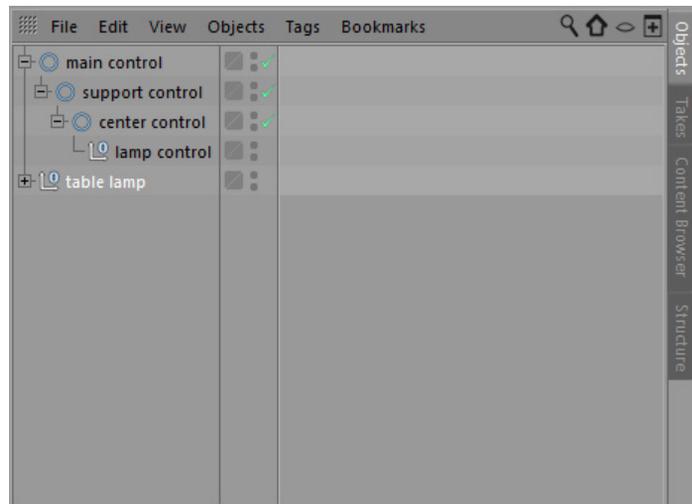


Figure 7-26 All controls connected in the Object Manager

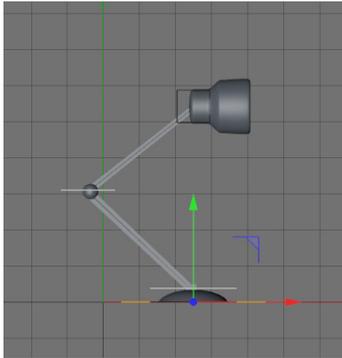


Figure 7-27 The table lamp moving along with main control

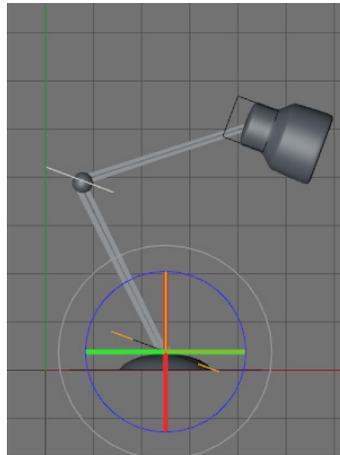


Figure 7-28 Supports and lamp shade rotating along with support control

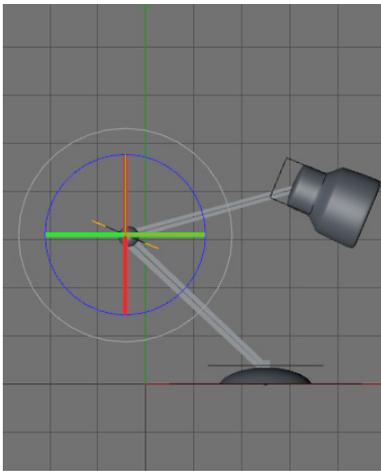


Figure 7-29 The support2 and lamp shade rotating along with center control

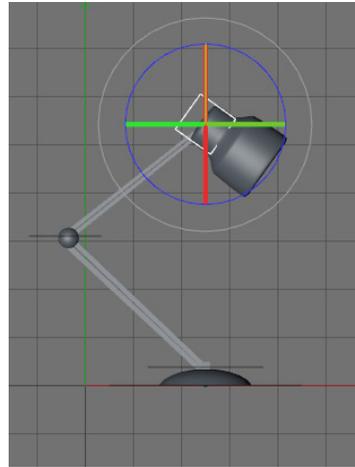


Figure 7-30 The lamp shade rotating along with lamp control

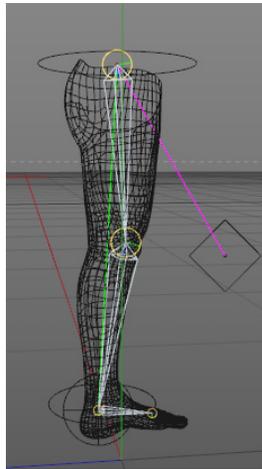


Figure 7-31 Rig for a human leg

Chapter 8

Animation

Learning Objectives

After completing this chapter, you will be able to:

- *Create key animation*
- *Create path animation*
- *Work with the Timeline panel*



Figure 8-1 The animated logo at frame 109



Figure 8-2 The `c08_tut1_start.c4d` file

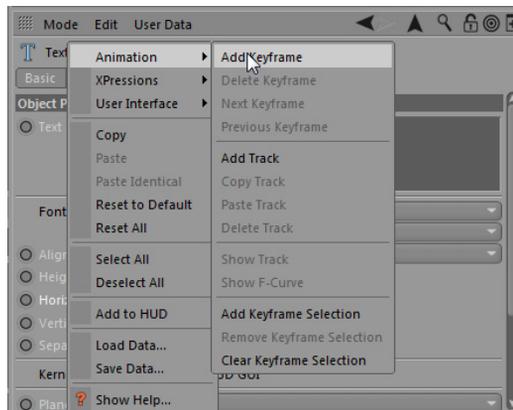
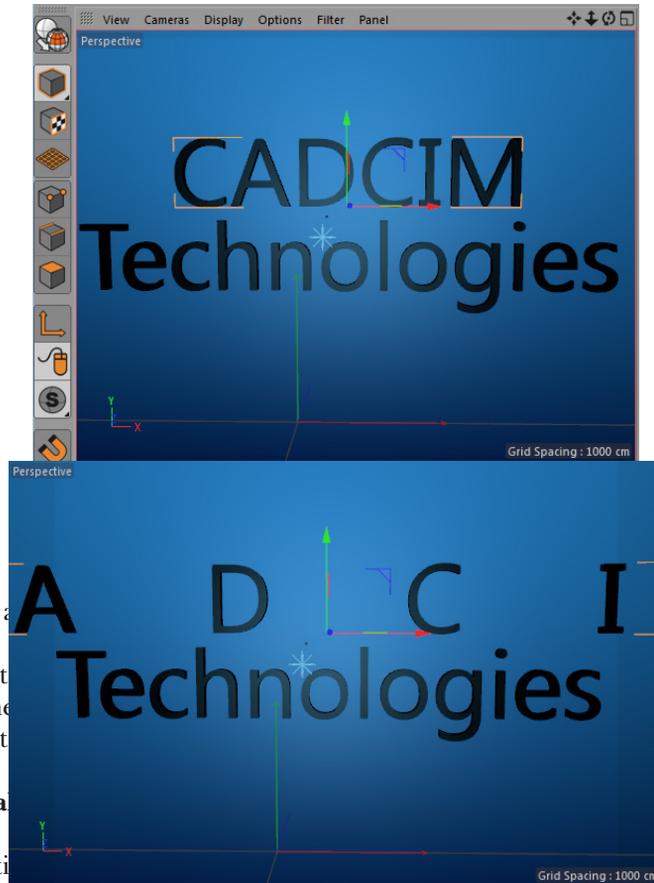


Figure 8-3 Choosing the **Add Keyframe** option from the shortcut menu



Next, you will a

5. Make sure that **CAD** is selected in the **Object Manager**. In the **Object Properties** area, enter **274** in the **Horizontal Spacing** spinner; the horizontal space between the text increases in the Perspective viewport.

The **Horizontal Spacing** property controls the space between the characters.

6. In the Animation toolbar, move the timeslider to frame 40. In the **Object Properties** area, enter **40** in the **Current Time** spinner; the timeslider is set to frame 40.

Figure 8-5 The space added between the text

7. Make sure that **CAD** is selected in the **Object Manager**. In the **Object Properties** area, enter **0** in the **Horizontal Spacing** spinner; the horizontal space between the text decreases in the Perspective viewport.
8. In the Animation toolbar, move the timeslider to frame 45.
9. Make sure that **CAD** is selected in the **Object Manager**. In the **Object Properties** area, enter **8** in the **Horizontal Spacing** spinner; the horizontal space between the text increases slightly in the Perspective viewport.
10. In the Animation toolbar, move the timeslider to frame 48.
11. Make sure that **CAD** is selected in the **Object Manager**. In the **Object Properties** area, enter **0** in the **Horizontal Spacing** spinner; the horizontal space between the text increases in the Perspective viewport.

Next, you will animate the height of the text, **CAD**.

12. Make sure that *CADCIM* is selected in the Object Manager. In the **Object Properties** area, right-click on the **Height** option; a shortcut menu is displayed. From this shortcut menu, choose **Animation > Add Keyframe**, refer to Figure 8-3; a keyframe is added and the circle located at the left of the **Height** option turns red.

The **Height** spinner is used to modify the height of the text.

13. In the Animation toolbar, move the timeslider to frame 65. Make sure that *CADCIM* is selected in the Object Manager. In the **Object Properties** area, enter **345** in the **Height** spinner; the height of the text increases in the Perspective viewport, refer to Figure 8-6.
14. In the Animation toolbar, move the timeslider to frame 75. Make sure that *CADCIM* is selected in the Object Manager. In the **Object Properties** area, enter **166** in the **Height** spinner; the height of the text decreases in the Perspective viewport, as shown in Figure 8-7.



Figure 8-6 The CADCIM text at frame 65



Figure 8-7 The CADCIM text at frame 75

15. In the Animation toolbar, move the timeslider to frame 83. Make sure that *CADCIM* is selected in the Object Manager. In the **Object Properties** area, enter **226** in the **Height** spinner; the height of the text increases in the Perspective viewport.
16. In the Animation toolbar, move the timeslider to frame 90. Make sure that *CADCIM* is selected in the Object Manager. In the **Object Properties** area, enter **187** in the **Height** spinner; the height of the text decreases.

Next, you will animate the text, *Technologies*.

17. Select *Technologies* in the Object Manager; the **Text Object [Technologies]** settings are displayed in the Attribute Manager.
18. In the Animation toolbar, move the timeslider to frame 100. In the **Object Properties** area, enter **0** in the **Height** spinner and then right-click on the **Height** option; a shortcut menu is displayed. Choose **Animation > Add Keyframe** from the shortcut menu.
19. In the Animation toolbar, move the timeslider to frame 120. Make sure that *Technologies* is selected in the Object Manager. In the **Object Properties** area, enter **200** in the **Height** spinner; the height of the text increases in the Perspective viewport.

Next, you will animate the rotation of the text, *Technologies*.

20. Choose the **Coord** button in the Attribute Manager; the **Coordinates** area is displayed. In the **Coordinates** area, right-click on the **R . H** option; a shortcut menu is displayed. Choose **Animation > Add Keyframe** from the shortcut menu; a keyframe is added to the timeslider and the circle on the left of the **R . H** option turns red.

21. In the Animation toolbar, move the timeslider to frame 120. Make sure that *Technologies* is selected in the Object Manager. In the **Object Properties** area, enter **200** in the **Height** spinner; a keyframe is added to the timeslider and the circle on the left of the **R . H** option turns red.

Fine-Tuning

In this section, you will fine-tune the animation of the text, *Technologies*.

1. Select *Technologies* in the Object Manager; the **Text Object [Technologies]** settings are displayed in the Attribute Manager. In the **Coordinates** area, right-click on the **R . H** option; a shortcut menu is displayed. Choose **Animation > Add Keyframe** from the shortcut menu; a keyframe is added to the timeslider and the circle on the left of the **R . H** option turns red.

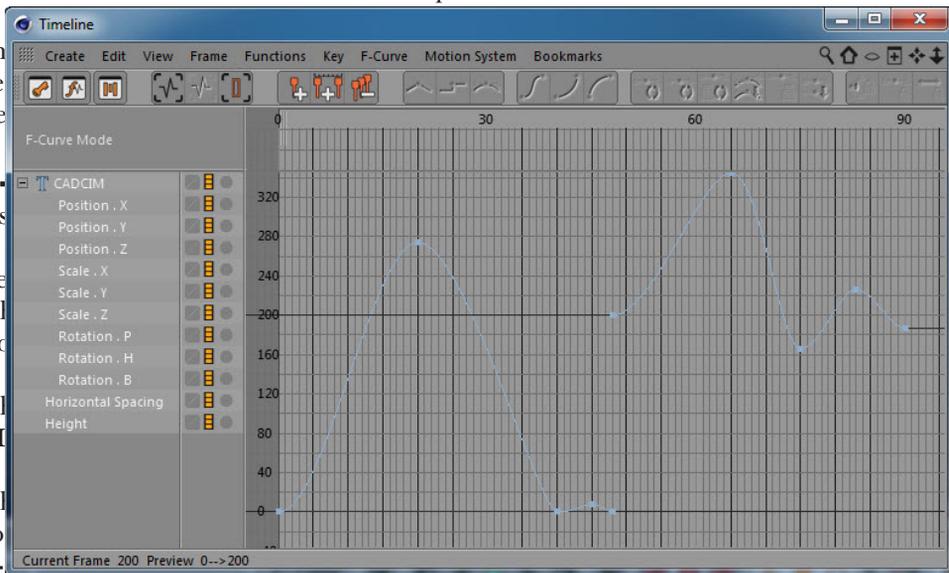


Figure 8-9 The Timeline window

2. In the **Timeline** window, make sure that the **F-Curve Mode** button is chosen. Next, press

CTRL+A to select all the keys in the **Timeline** window, as shown in Figure 8-10.

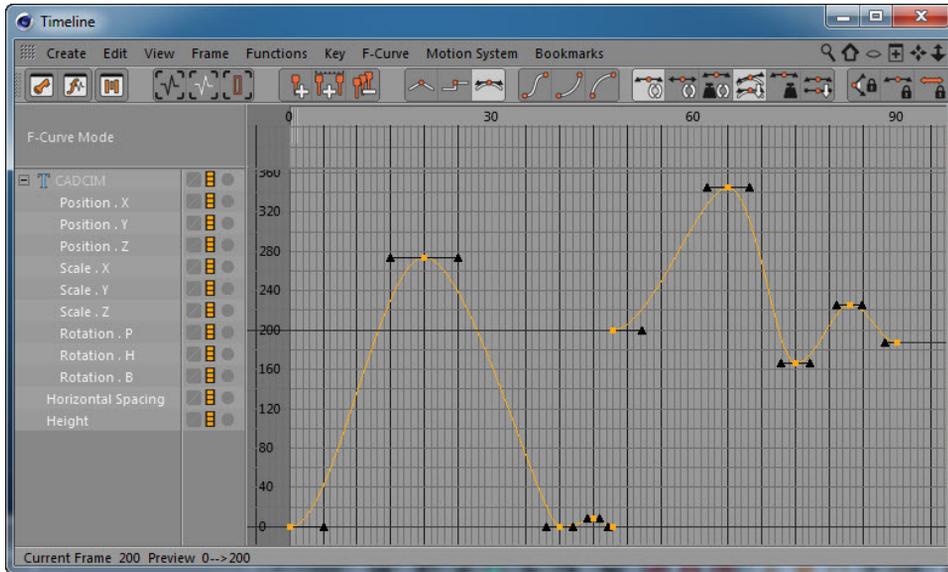


Figure 8-10 Selecting all the keys in the **Timeline** window

The **F-Curve Mode** is used to modify the interpolation of the keyframes.

- In the **Timeline** window, choose the **Linear** button; all the curves are set to linear, as shown in Figure 8-11. Now, close the **Timeline** window.

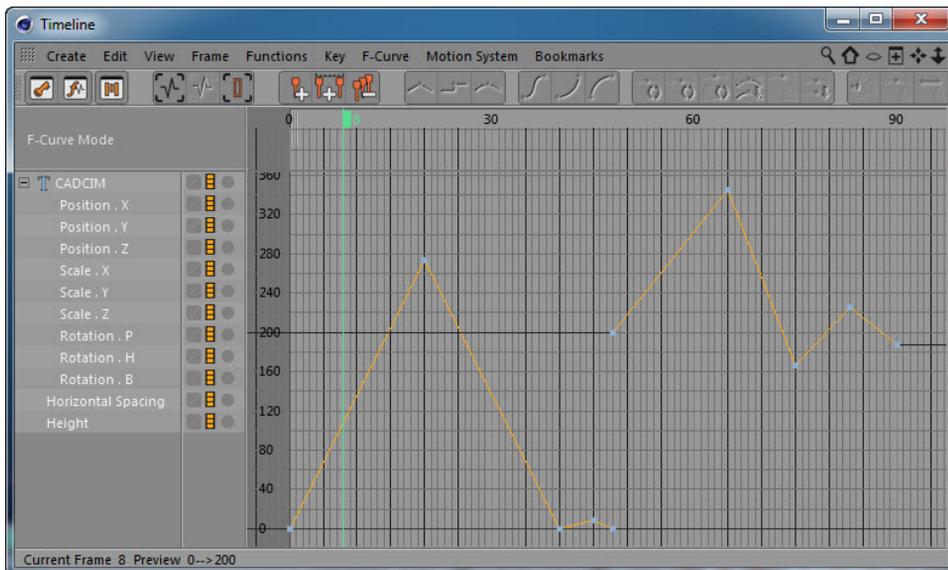


Figure 8-11 Displaying the linear shape of curves

The **Linear** button is used to set a linear interpolation between the selected keyframes.

Saving and Rendering the Animation

In this section, you will save and render the animation. You can also view the final render sequence by downloading the file *c08_cinema4d_r19_rndr.zip* from *www.cadcim.com*. The path of the file is mentioned at the beginning of the chapter.

1. Choose the **Edit Render Settings** tool from the Command Palette; the **Render Settings** window is displayed. In this window, make sure that the **Output** option is selected in the list displayed at the left side of the window. In the **Output** area, make sure that the **To** spinner is set to **200**.
2. Select the **Save** option from the list displayed on the left in the **Render Settings** window; the **Regular Image** area is displayed. In this area, make sure that the **Save** check box is selected. Next, choose the browse button located next to the **File** spinner; the **Save File** dialog box is displayed.

The **Save** check box is selected by default. It is used to render the image or sequence automatically on choosing the **Render to Picture Viewer** tool.

3. In the **Save File** dialog box, browse to `|Documents|c4dr19\c08` and enter **c08tut1** in the **File name** text box. Next, choose the **Save** button.
4. Make sure that the **AVI Movie** option is selected in the **Format** drop-down list. Next, close the **Render Settings** window.
5. Choose the **Render to Picture Viewer** tool from the Command Palette; the **Picture Viewer** window is displayed and the rendering begins. The file is automatically saved at the specified location.

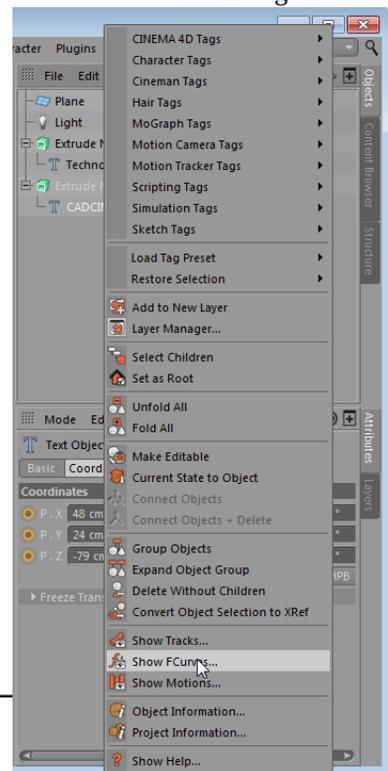


Figure 8-8 Choosing **Show FCurves** from the shortcut menu

Tutorial 2

In this tutorial, you will create a basket ball animation, as shown in Figure 8-12.

(Expected time: 35 min)



The following steps are required to complete this tutorial:

a. Open the file.

b. Animate.

c. File.

d. Save.

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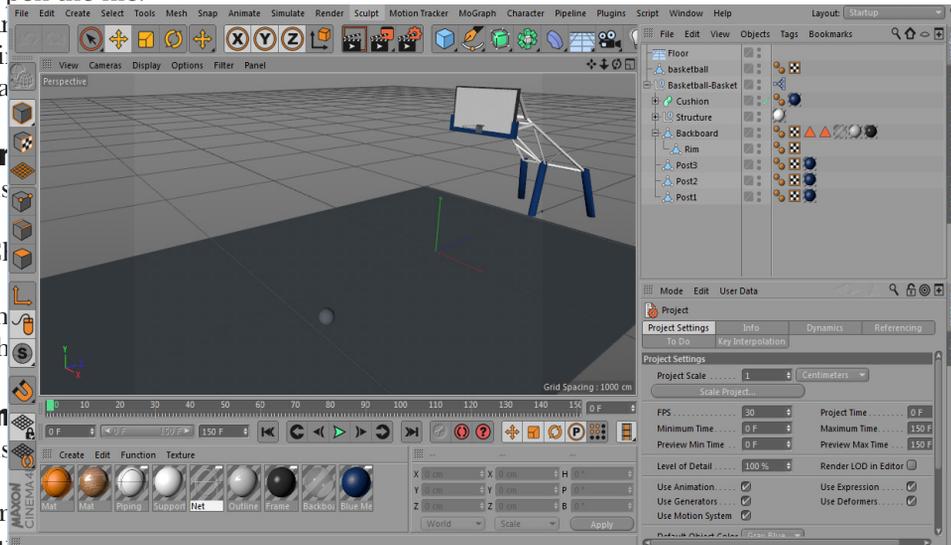
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Figure 8-13 The *c08_tut2_start.c4d* file

2. Select *basketball* in the Object Manager and then choose the **Coord** button in the Attribute Manager, if not already chosen; the **Coordinates** area is displayed. In the **Coordinates** area, right-click on the circle located on the left of the **P . X** spinner; a shortcut menu is displayed. Choose **Animation > Add Keyframe** from the shortcut menu; the circle located on the left of **P . X**, **P . Y**, and **P . Z** turns red.

3. In the **Coordinates** area, set the parameters as follows:

P . X: -40.84

P . Y: 464.471

P . Z: -815.996

Figure 8-14 displays *basketball* at frame 0.



Figure 8-14 The *basketball* at frame 0

4. In the Animation toolbar, move the timeslider to frame 10. Alternatively, enter **10** in the **Current Time** spinner; the timeslider is set to frame 10.
5. Make sure *basketball* is selected in the Object Manager. In the **Coordinates** area, set the parameters as follows:

P . Y: **796.753**

P . Z: **-455.277**

Figure 8-15 displays *basketball* at frame 10.

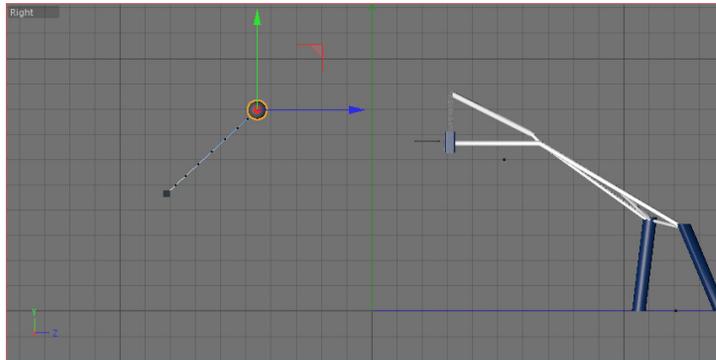


Figure 8-15 The basketball at frame 10

6. In the Animation toolbar, move the timeslider to frame 20.
7. Make sure *basketball* is selected in the Object Manager. In the **Coordinates** area, set the parameters as follows:

P . Y: **954.44**

P . Z: **28.102**

Figure 8-16 displays *basketball* at frame 20.

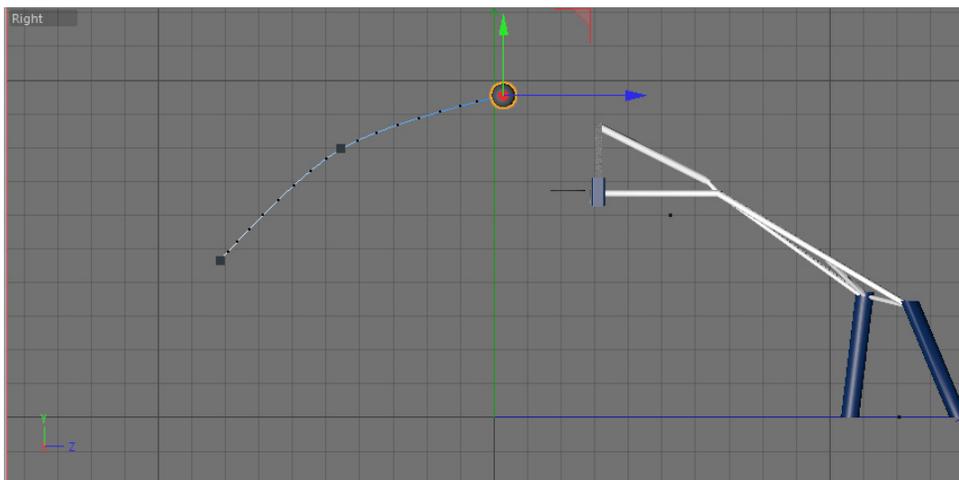


Figure 8-16 The basketball at frame 20

8. In the Animation toolbar, move the timeslider to frame 30.
9. Make sure *basketball* is selected in the Object Manager. In the **Coordinates** area, set the parameters as follows:

P . Y: **739.71**

P . Z: **248.523**

Figure 8-17 displays *basketball* at frame 30.

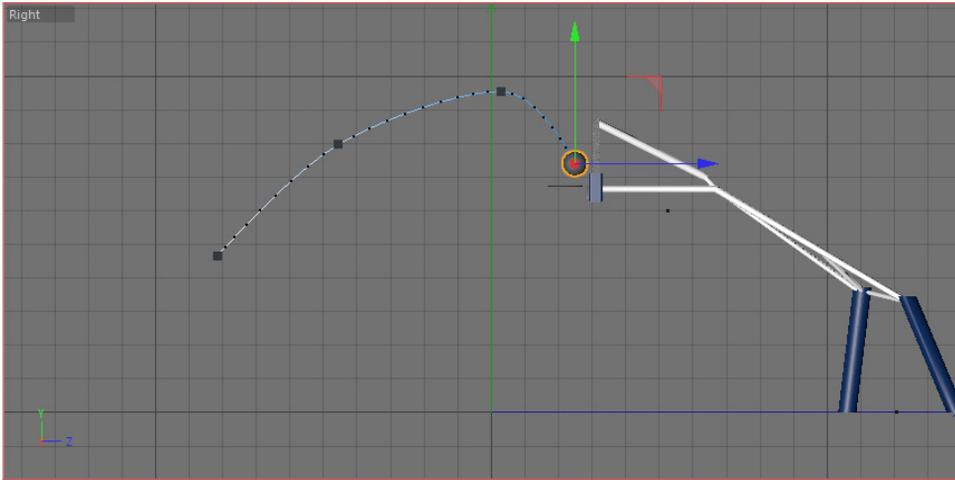


Figure 8-17 The basketball at frame 30

10. In the Animation toolbar, move the timeslider to frame 34.
11. Make sure *basketball* is selected in the Object Manager. In the **Coordinates** area, set the parameters as follows:

P . Y: **567.025**

P . Z: **235.442**

Figure 8-18 displays *basketball* at frame 34.

12. Similarly, move the timeslider to frames and set the values in the Attribute Manager as given in Table 8-1.

Table 8-1 The transformation values of basketball

Frame to be selected	P . Y	P . Z
40	29.429	18.251
50	332.391	-95.207
64	30.581	-229.294
73	227.576	-322.123
84	31.041	-435.581

91	141.612	-507.782
100	32.92	-609.611
150	32.92	-1061.761

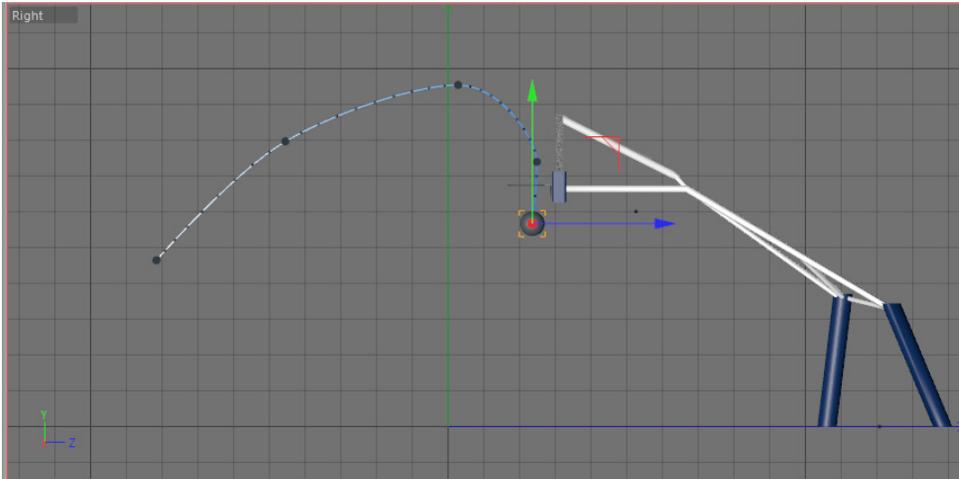


Figure 8-18 The basketball at frame 34

Figure 8-19 displays *basketball* at frame 150.

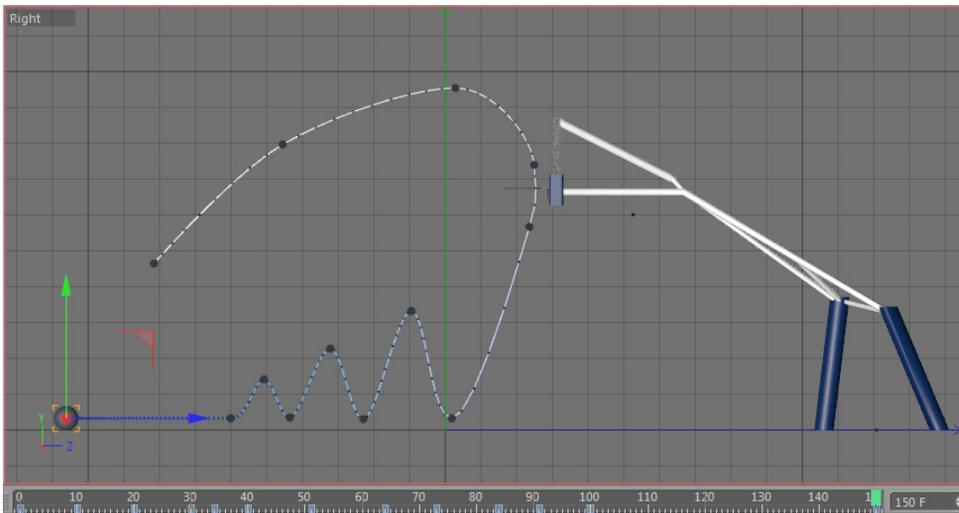


Figure 8-19 The basketball at frame 150

13. Choose the **Play Forwards** button from the Animation toolbar to view the animation of *basketball*.

Next, you will rotate *basketball*.

14. Make sure *basketball* is selected in the Object Manager. Next, move the timeslider to frame 0. In the **Coordinates** area, right-click on the circle located on the left of the **R . H** spinner; a shortcut menu is displayed. From this shortcut menu, choose **Animation > Add Keyframe**; the circle located at the left of the **R . H**, **R . P**, and **R . B** spinners turn red.
15. Move the timeslider to frames and set the values in the Attribute Manager as given in Table 8-2.

Table 8-2 The rotation values of basketball

Frame to be selected	R . P
40	90
64	180
84	270
100	360
150	520

Next, you will create the squash and stretch effect on *basketball* when it touches *Floor*.

16. Move the timeslider to frame 39. In the **Coordinates** area, right-click on the circle located on the left of the **S . X** spinner; a shortcut menu is displayed. From this shortcut menu, choose **Animation > Add Keyframe**; the circle located at the left of the **S . X**, **S . Y**, and **S . Z** spinners turns red.

Next, you need to copy the keyframe created at frame 39 to other frames.

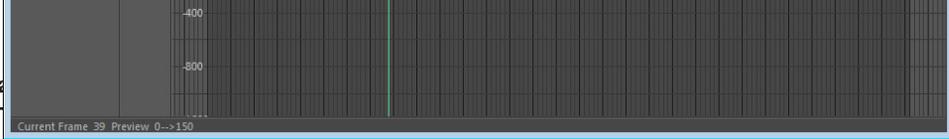
17. Make sure *basketball* is selected in the Object Manager and right-click on it; a shortcut menu is displayed. Choose **Show FCurves** from the shortcut menu, refer to Figure 8-8; the **Timeline** window is displayed.
18. Select **Scale . X**, **Scale . Y**, and **Scale . Z**, from the list displayed on the left pane of the **Timeline** window. Next, select the keyframe at frame 39 by using the rectangular marquee selection, as shown in Figure 8-20. Next, press CTRL+C. Now, move the timeslider to frame 43 and press CTRL+V; the selected keyframe is copied to frame 43.



Note

Choose **F-Curve > Show All Tracks** from the **Timeline** window menu bar to display only the selected curves in the window.

19. Similarly copy the selected keyframe at frames 67 and 87. Next, minimize the **Timeline** window.
20. Move the timeslider to frame 40. Select *basketball* in the Object Manager again. In the **Coordinates** area, enter the value **0.87** in the **S . Z** spinner; *basketball* is squashed and a



keyframe is created at this frame, refer to Figure 8-21.
Figure 8-20 Selecting the keyframe from the **Timeline** window

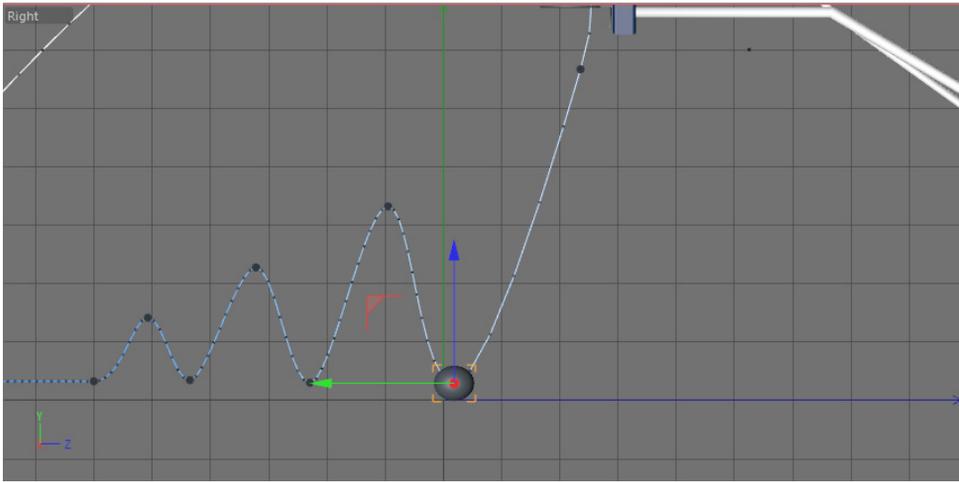


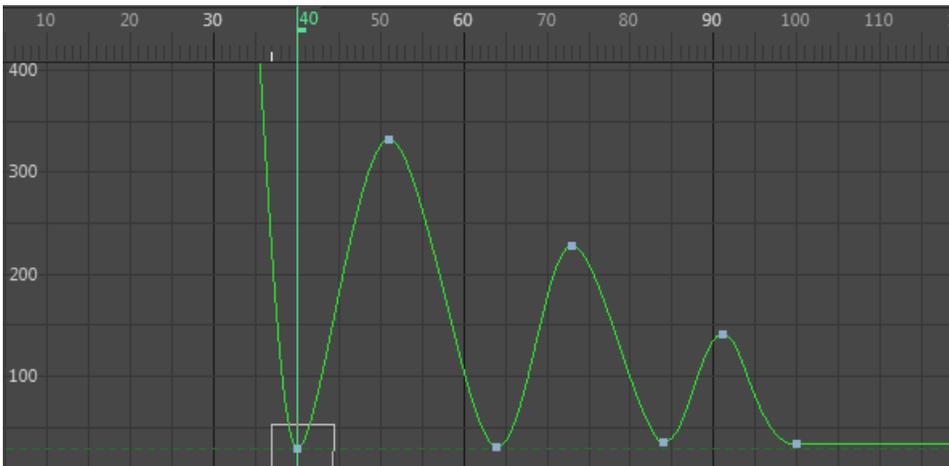
Figure 8-21 Squashed basketball at frame 40

21. Move the timeslider to frame 64. In the **Coordinates** area, enter the value **0.87** in the **S . Y** spinner; basketball is squashed and a keyframe is created at this frame.
22. Move the timeslider to frame 84. In the **Coordinates** area, enter the value **0.87** in the **S . X** spinner; basketball is squashed and a keyframe is created at this frame.
23. Choose the **Play Forwards** button from the Animation toolbar to view the animation of *basketball*.

Fine-Tuning the Animation

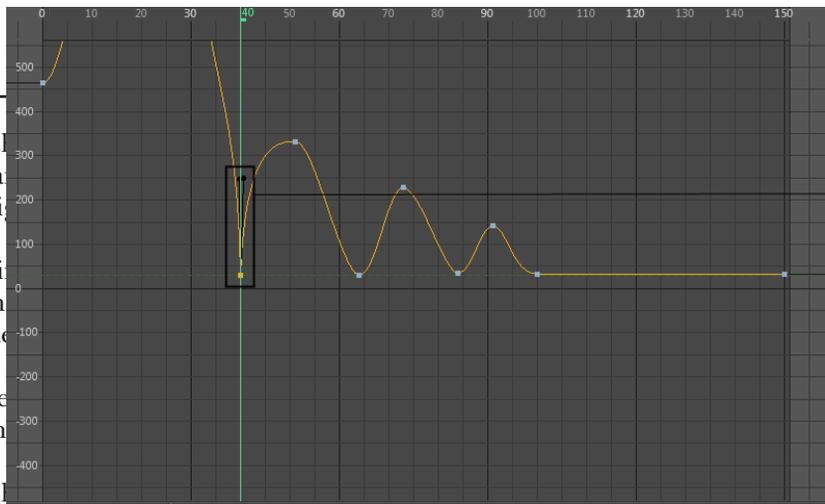
In this section, you will fine-tune the animation using the **Timeline** window.

1. In the Animation toolbar, move the timeslider to frame 40. Next, maximize the **Timeline** window. Select **Position Y** from the list displayed on the left pane of the **Timeline** window. Select the keyframe at frame 40 by using the rectangular marquee selection, refer to Figure 8-22.



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Figure 8-23 Moving the tangents in the **Timeline** window

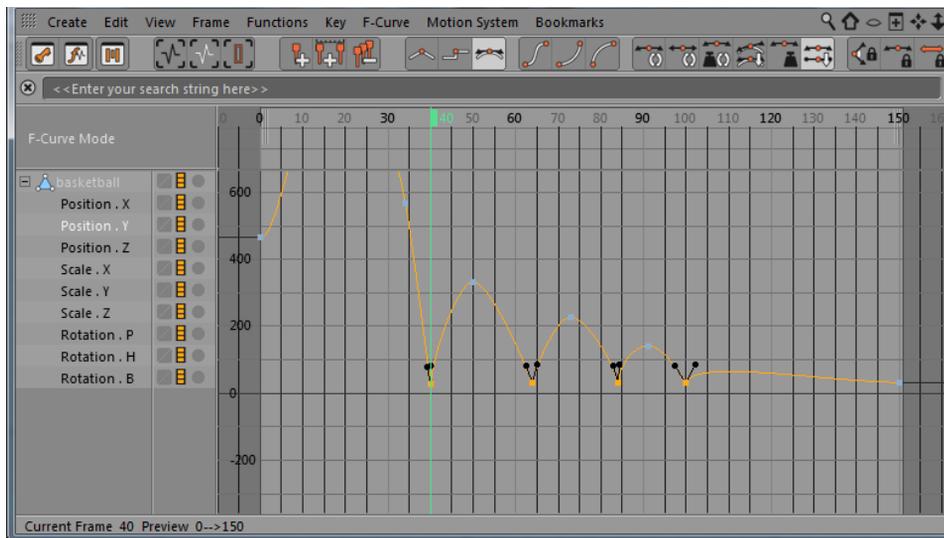


Figure 8-24 Moving the tangents at other frames

Saving and Rendering the Animation

In this section, you will save and render the animation. You can also view the final render sequence by downloading the file *c08_cinema4d_r19_rndr.zip* from www.cadcim.com. The path of the file is mentioned at the beginning of the chapter.

1. Choose the **Edit Render Settings** tool from the Command Palette; the **Render Settings** window is displayed. In this window, choose the **Output** button; the **Output** area is displayed. In this area, enter **150** in the **To** spinner; the **Frames** option gets updated to **151** (from 0 to 150).
2. Choose the **Save** button from the list displayed on the left in the **Render Settings** window; the **Regular Image** area is displayed. In this area, make sure that the **Save** check box is

selected. Next, choose the browse button located next to the **File** text box; the **Save File** dialog box is displayed.

3. In the **Save File** dialog box, browse to the location `|Documents|c4dr19|c08` and enter **c08tut2** in the **File name** text box. Next, choose the **Save** button.
4. Select the **AVI Movie** option from the **Format** drop-down list. Next, close the **Render Settings** window.
5. Choose the **Render to Picture Viewer** tool from the Command Palette; the **Picture Viewer** window is displayed and the rendering begins. The file is automatically saved at the specified location.

Tutorial 3

In this tutorial, you will animate the cart using the path animation and key animation, refer to Figure 8-25. **(Expected time: 25 min)**

The following steps are required to complete this tutorial:

- a. Open the file.
- b. Align the cart along a spline path.
- c. Move the cart.
- d. Rotate the wheels of the cart.
- e. Save and render the scene.

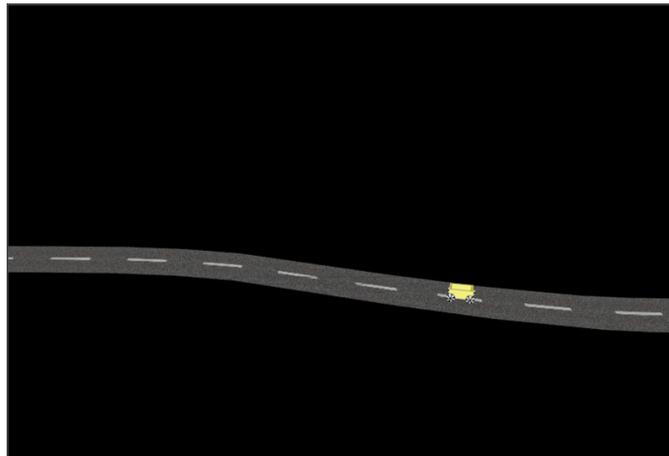


Figure 8-25 Moving cart at frame 45

Opening the File

In this section, you will open the file.

1. Choose **File > Open** from the main menu; the **Open File** dialog box is displayed.
2. In the **Open File** dialog box, browse to `\Documents\c4dr19\c08\c08_tut3_start.c4d` and then choose the **Open** button; the `c08_tut3_start` file is opened, as shown in Figure 8-26.

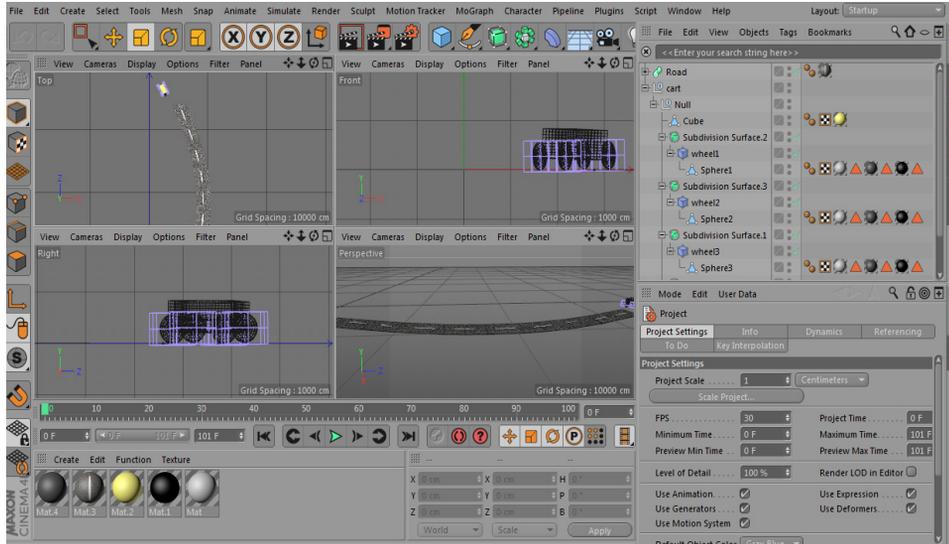


Figure 8-26 The `c08_tut3_start` file

Aligning the Cart along a Spline Path

In this section, you will align the cart along a spline path using a CINEMA 4D tag.

1. Select `cart` in the Object Manager. Next, right-click on it; a shortcut menu is displayed. Choose **CINEMA 4D Tags > Align to Spline** from the shortcut menu, as shown in Figure 8-27; the **Align to Spline Expression [Align to Spline]** tag is added to the Object Manager, as shown in Figure 8-28.

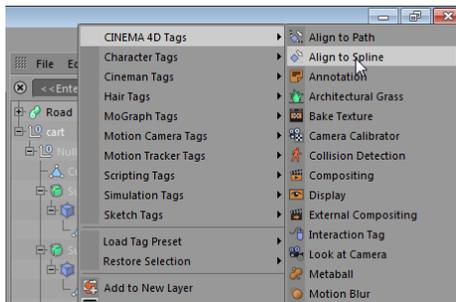


Figure 8-27 Choosing **Align to Spline** from the shortcut menu

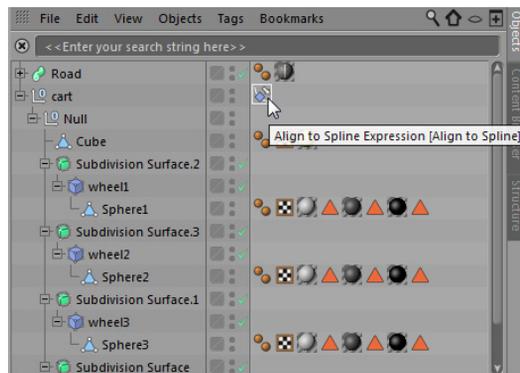


Figure 8-28 The **Align to Spline Expression [Align to Spline]** tag in the Object Manager

- Expand *Road* in the Object Manager. Also, make sure the **Align to Spline Expression [Align to Spline]** tag is selected in the Object Manager.
- In the Attribute Manager, make sure the **Tag** button is chosen. Next, choose the Arrow button located next to the **Spline Path** option in the **Tag Properties** area; the shape of the cursor is changed. Next, select *Spline* from the Object Manager; *Spline* is displayed in the **Spline Path** edit box in the Attribute Manager; refer to Figure 8-29. Maximize the Perspective viewport. You will notice that *cart* is aligned with *Road* in the Perspective viewport, as shown in Figure 8-30.

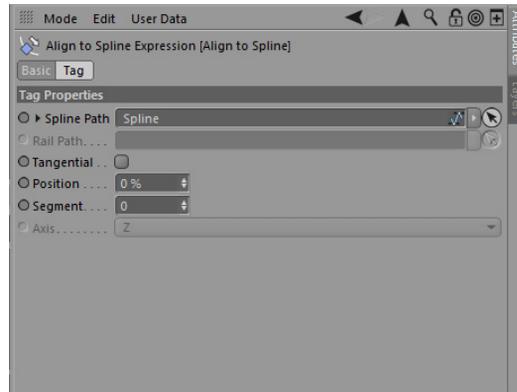


Figure 8-29 Spline displayed in the Spline Path edit box

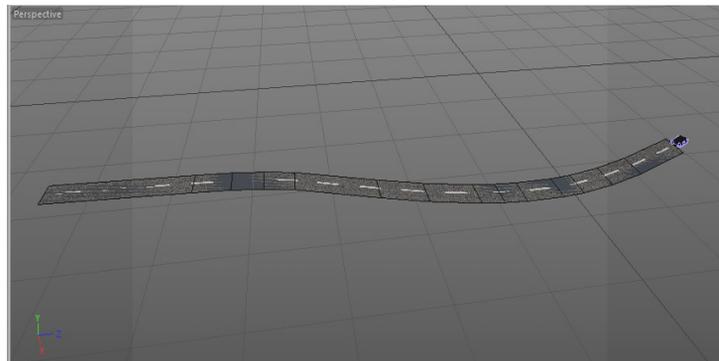


Figure 8-30 cart aligned with Road

Moving the Cart

In this section, you will move *cart* by setting the keyframe for the **Position** spinner of the **Align to Spline Expression [Align to Spline]** tag.

- Make sure the timeslider is at frame 0. In the Attribute Manager, right-click on the circle located at the left of the **Position** spinner in the **Tag Properties** area; a shortcut menu is

- displayed. Choose **Animation > Add Keyframe** from it; the circle turns red and a keyframe is added at frame 0.
2. Move the time slider to frame 101. Next, in the Attribute Manager, enter **100** in the **Position** spinner.
 3. Right-click on the circle located at the left of the **Position** spinner; a shortcut menu is displayed. Choose **Animation > Add Keyframe** from it; the circle turns red and a keyframe is added at frame 101. Also, *cart* is moved to the end of *Road*.
 4. Choose the **Play Forwards** button from the Animation toolbar. You will notice that *cart* is not moving exactly along *Road* on its curved stretch, refer to Figure 8-31. To overcome it, select the **Tangential** check box located above the **Position** spinner in the Attribute Manager.

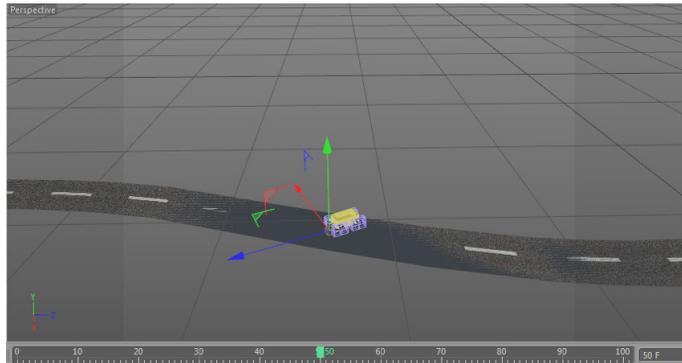


Figure 8-31 cart at frame 50

5. Choose the **Play Forwards** button from the Animation toolbar again. Now, you will notice that *cart* is moving exactly along *Road*.

Rotating the Wheels of the Cart

In this section, you will rotate the wheels of *cart* by setting keyframes at different frames to get a realistic look. You will also use the Timeline panel in the **Animation** layout to copy and paste the repetitive keyframes.

1. In the Object Manager, select *Sphere1*. In the Animation toolbar, choose the **Autokeying** button and make sure that the timeslider is set to frame 0.
2. In the Attribute Manager, choose the **Coord** button; the **Coordinates** area is displayed. Next, right-click on the circle located at the left of the **R . H** spinner and choose **Animation > Add Keyframe** from the shortcut menu displayed; a keyframe is added for *Sphere1* at frame 0.
3. Similarly, move the timeslider to the frames mentioned in Table 8-3 and add keyframes by setting the rotation values in the Attribute Manager as given in Table 8-3.

Table 8-3 Rotation values for *Sphere1*

Frame to be selected	R . H
5	-90
10	-180
15	-270
20	-360
21	0

You will notice that one round of rotation of *wheel1* is completed by setting the keyframes mentioned above.

Next, you need to copy these keyframes to repeat the rotation of *wheel1*. To copy the keyframes, you will use the Timeline panel in the **Animate** layout.

4. Select **Animate** from the **Layout** drop-down list located at the top right corner of the interface, as shown in Figure 8-32; the Animation layout is displayed, as shown in Figure 8-33.
5. In the **Animate** layout, enlarge the Timeline panel and zoom in the newly keyframes created using the navigation tools in it, refer to Figure 8-34. Figure 8-34 shows the modified size of the Timeline panel.

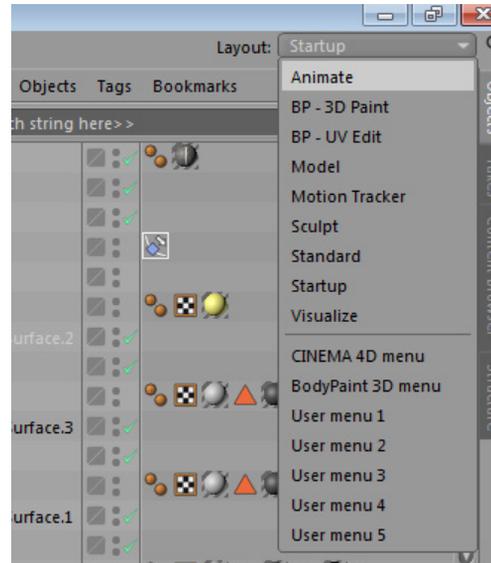


Figure 8-32 Selecting *Animate* from the *Layout* drop-down list



Figure 8-33 The *Animate* layout displayed

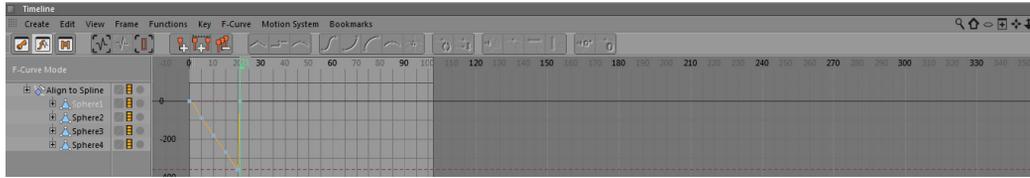


Figure 8-34 The modified size of the Timeline panel

6. Select five keyframes (excluding the keyframe at frame 0) in the Timeline panel by using the rectangular marquee selection, as shown in Figure 8-35.
7. Choose **Edit > Copy** from the Timeline menu, as shown in Figure 8-36.
8. Move the timeslider to frame 25. Next, choose **Edit > Paste** from the Timeline menu; the keyframes are copied, refer to Figure 8-37.

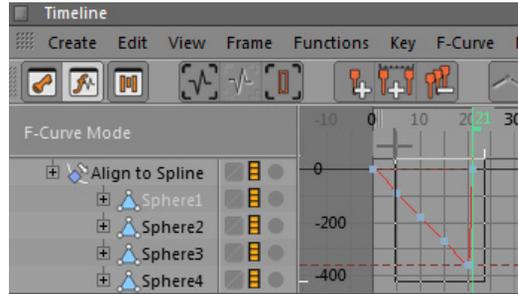


Figure 8-35 Selecting all keyframes

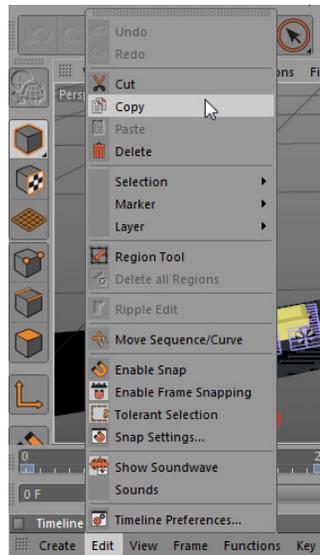


Figure 8-36 Choosing Copy from the Edit menu

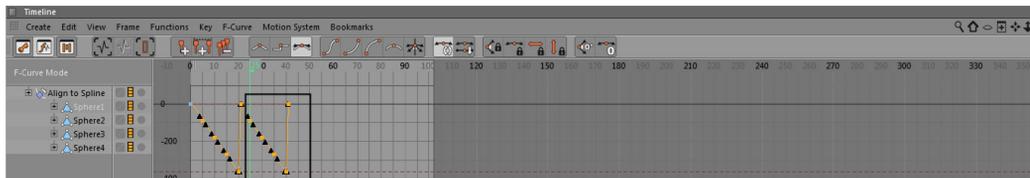


Figure 8-37 Copied keyframes

9. Move the timeslider to frame 45. Next, choose **Edit > Paste** from the Timeline menu; the keyframes are copied.
10. Move the timeslider to frame 65. Next, choose **Edit > Paste** from the Timeline menu; the keyframes are copied.
11. Move the timeslider to frame 85. Next, choose **Edit > Paste** from the Timeline menu; the keyframes are copied. Figure 8-38 shows all keyframes for *Sphere1*.

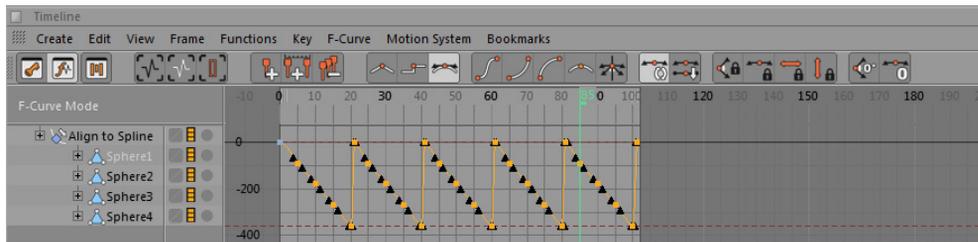


Figure 8-38 All keyframes for *Sphere1*

12. Move the timeslider to frame 0. In the Object Manager, select *Sphere2*.
13. In the Attribute Manager, choose the **Coord** button; the **Coordinates** area is displayed. Next, right-click on the circle located at the left of the **R . H** spinner and choose **Animation > Add Keyframe** from the shortcut menu displayed; a keyframe is added for *Sphere2* at frame 0.
14. Choose the **Dope Sheet** button and then select *Sphere1*. Next, select all keyframes from the Timeline panel using the rectangular marquee selection.
15. Choose **Edit > Copy** from the Timeline menu. Next, select *Sphere2* and make sure the timeslider is at frame 0. Now, choose **Edit > Paste** from the Timeline menu; all keyframes of *Sphere1* are copied to *Sphere2*.
16. Repeat the steps 13 through 15 for *Sphere3* and *Sphere4* in the Object Manager to set keyframes for them.

Saving and Rendering the Animation

In this section, you will save and render the animation. You can also view the final render sequence by downloading the file *c08_cinema4d_r19rndr.zip* from www.cadcim.com. The path of the file is mentioned at the beginning of the chapter.

1. Choose the **Edit Render Settings** tool from the Command Palette; the **Render Settings** window is displayed. In this window, choose the **Output** button; the **Output** area is displayed. In this area, enter **101** in the **To** spinner; the **Frames** option gets updated to **102** (from 0 to 101).

- Choose the **Save** button from the list displayed on the left in the **Render Settings** window; the **Regular Image** area is displayed. In this area, make sure that the **Save** check box is selected. Next, choose the browse button located next to the **File** text box; the **Save File** dialog box is displayed.
- In the **Save File** dialog box, browse to the location `\Documents\c4dr19\c08` and enter **c08tut3** in the **File name** text box. Next, choose the **Save** button. Select the **AVI Movie** option from the **Format** drop-down list. Next, close the **Render Settings** window.

Self-Evaluation Test

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

- Which of the following buttons is used to set the keys automatically for the changes made in the animation?
 - Autokeying**
 - Play Forwards**
 - Edit Render Settings**
 - Show FCurves**
- Which of the following options is used to add a keyframe to a selected frame?
 - Render to Picture Viewer**
 - Create Preview**
 - Add Keyframe**
 - None of these
- Which of the following combination of shortcut keys is used to add a keyframe?
 - SHIFT+LMB
 - CTRL+LMB
 - CTRL+Click
 - SHIFT+Click
- _____ is an act of giving life to a 3D object or character.
- The _____ check box in the Attribute Manager is used to move an object exactly along the path.

Review Questions

Answer the following questions:

- Which of the following buttons in Animation toolbar is used to play an animation?

- (a) **Play Forwards** (b) **Autokeying**
(c) **Keyframe Selection** (d) None of these
2. The _____ panel in the Animation layout is used to copy and paste repetitive keyframes.
 3. The _____ button in the **Timeline** window is used to set linear interpolation between the selected keyframes.
 4. The _____ spinner is used to manually enter the starting frame of the animation to be rendered.

EXERCISE

The rendered video sequence of the animation in the exercise can be accessed by downloading the *c08_cinema4d_r19_exr.zip* file from www.cadcim.com. The path of the file is as follows: *Textbooks > Animation and Visual Effects > MAXON CINEMA 4D > MAXON CINEMA 4D R19 Studio: A Tutorial Approach*

Exercise 1

Open the model shown in Figure 8-39 and then animate the keys falling from the table. Also, fine-tune the animation. **(Expected time: 35 min)**

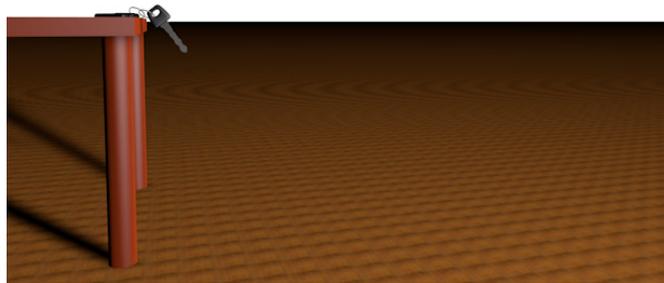


Figure 8-39 The *c08_exr01_start* file

Answers to Self-Evaluation Test

1. a, 2. c, 3. c, 4. Animation, 5. Tangential

Chapter 9

Introduction to UV Mapping

Learning Objectives

After completing this chapter, you will be able to:

- *Work in different UV layouts*
- *Unwrap 3D models*
- *Paint texture on 3D models*

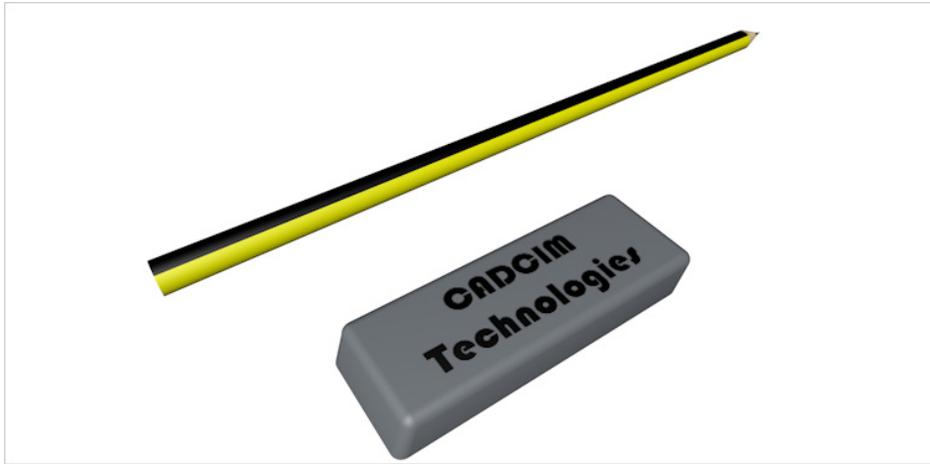


Figure 9-1 The final output

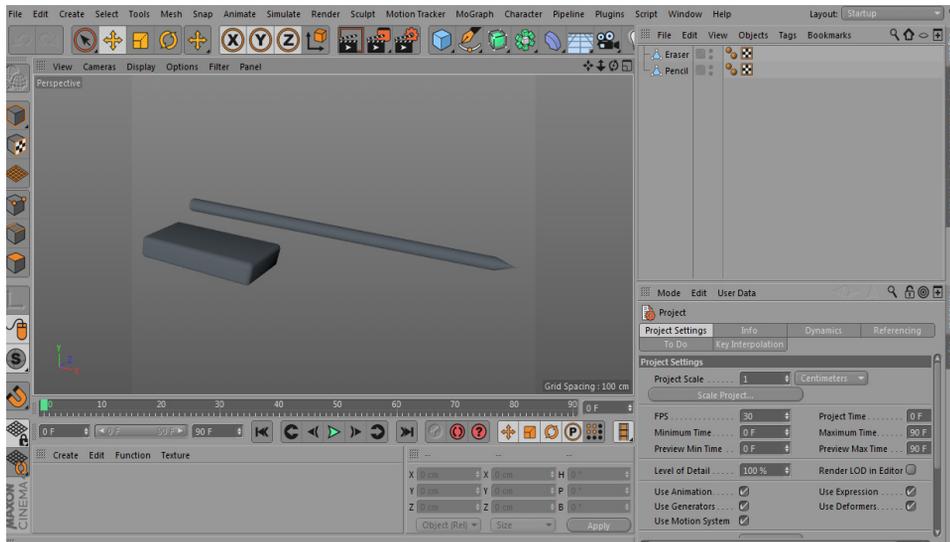


Figure 9-2 The c09_tut1_start.c4d file

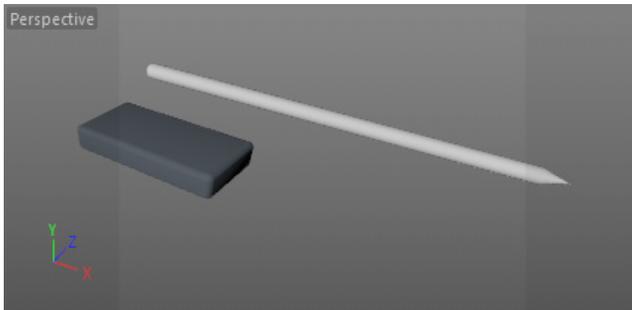


Figure 9-3 The material applied to Pencil

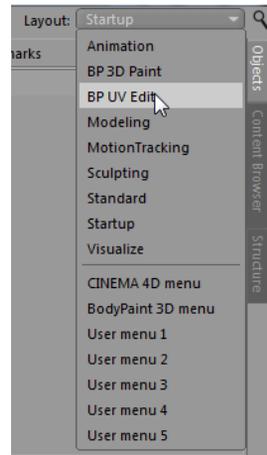


Figure 9-4 The Layout drop-down list

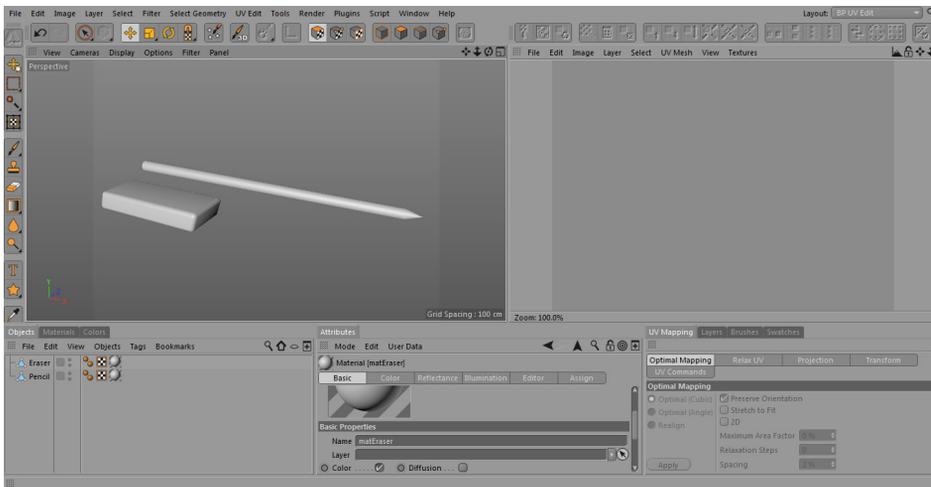


Figure 9-5 The BP UV Edit layout

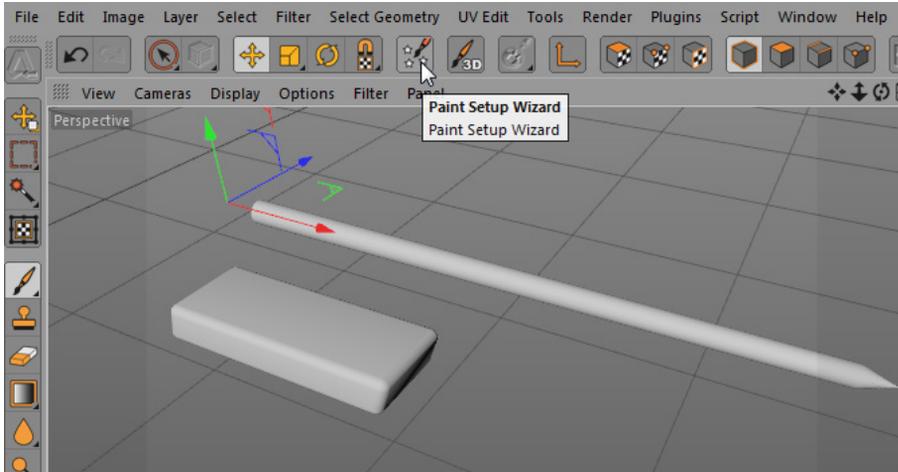


Figure 9-6 Choosing the **Paint Setup Wizard** tool from the Command Palette

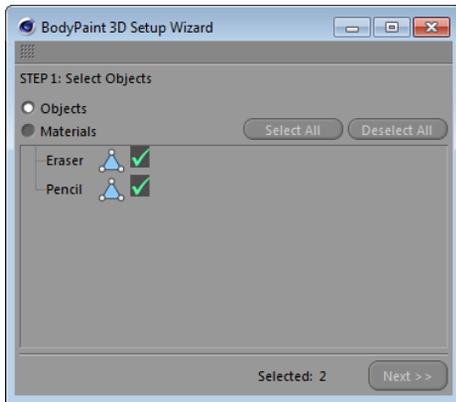


Figure 9-7 The **BodyPaint 3D Setup Wizard** dialog box

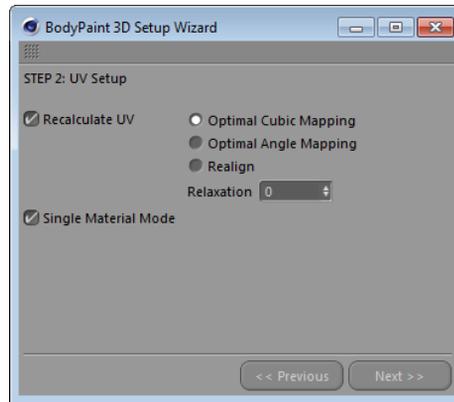


Figure 9-8 The **STEP 2: UV Setup** area

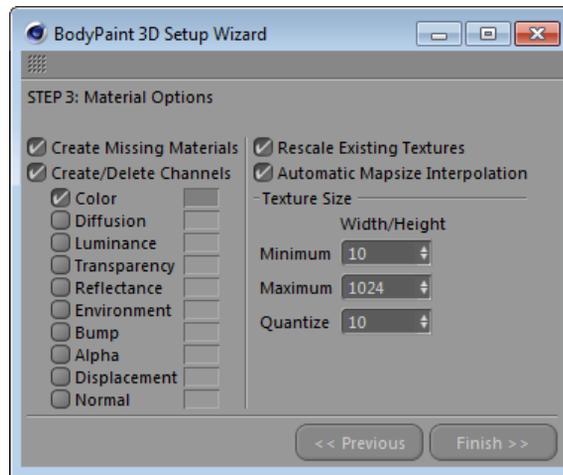


Figure 9-9 The Material Options area in the BodyPaint 3D Setup Wizard dialog box

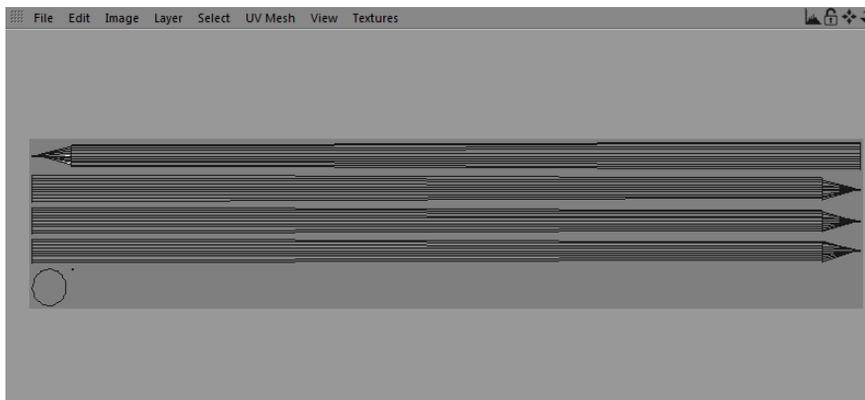


Figure 9-10 The UV Mesh of Pencil

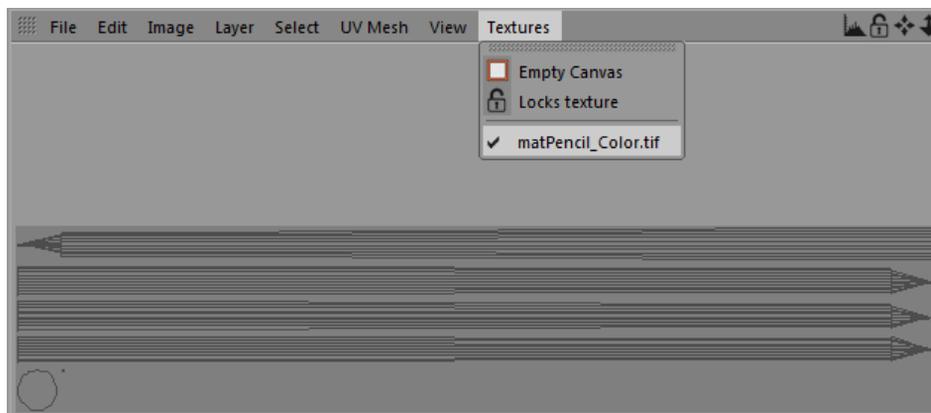


Figure 9-11 The matPencil_Color.tif option chosen from the Textures menu

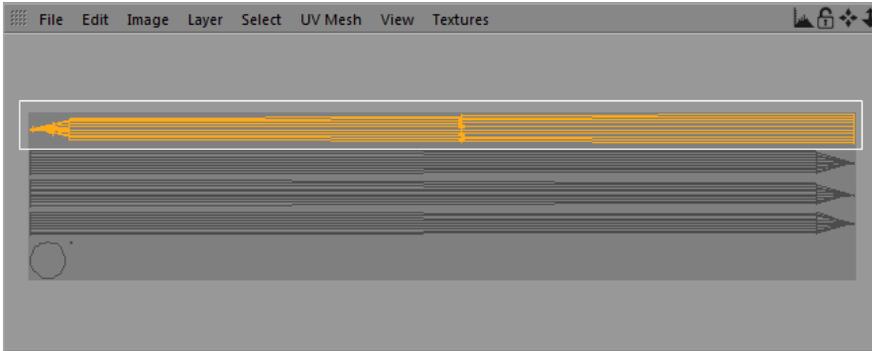


Figure 9-12 The selected polygons of Pencil

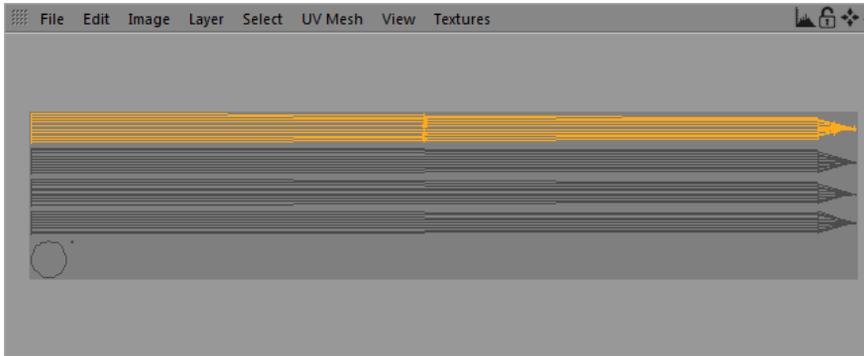


Figure 9-13 The mirrored polygons

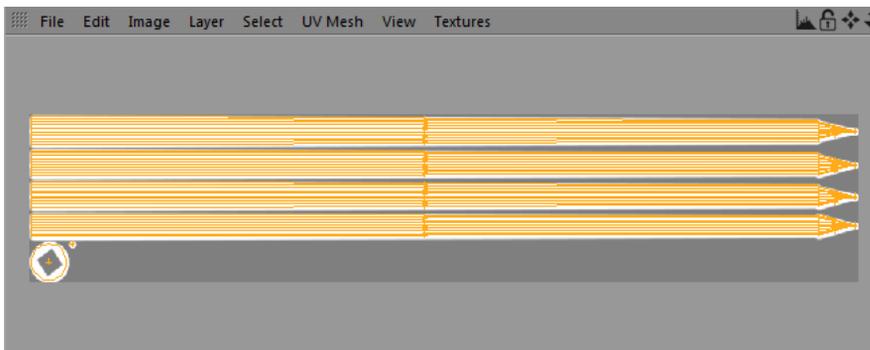


Figure 9-14 The outlined polygons

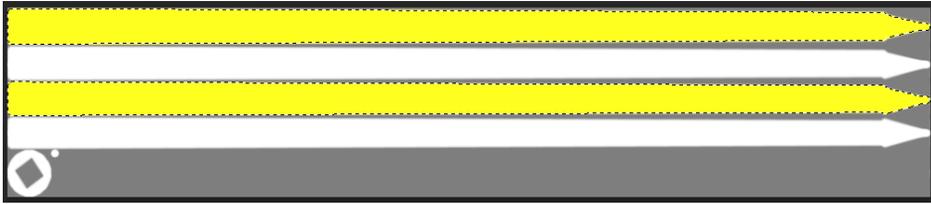


Figure 9-15 The yellow color in the selected area of the canvas

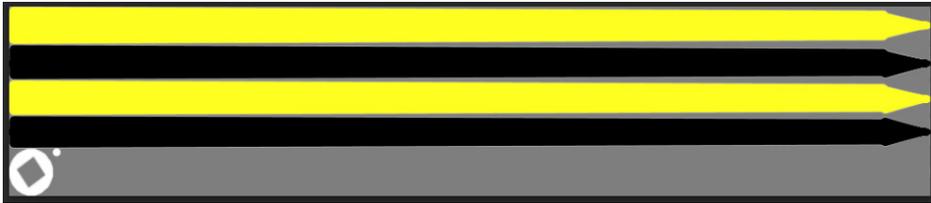


Figure 9-16 The black color in the selected area of the canvas



Figure 9-17 Color filled in the remaining parts of pencil

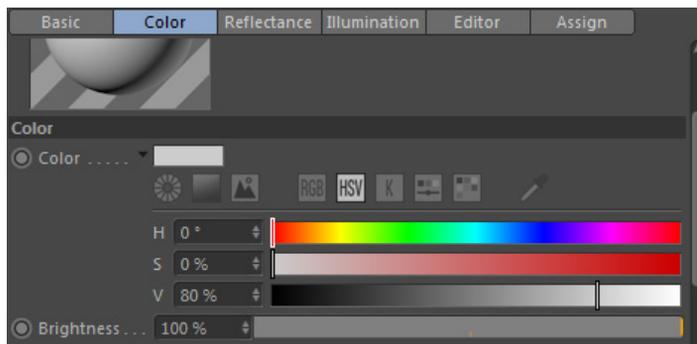


Figure 9-18 Choosing the browse button in the Attribute Manager

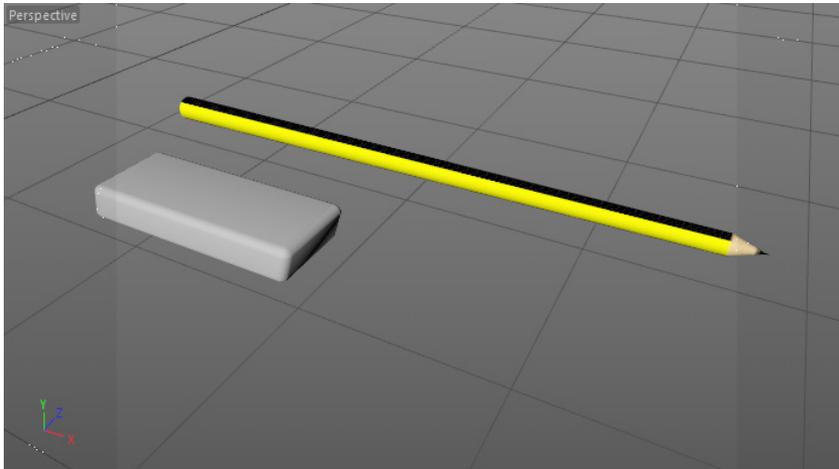


Figure 9-19 The texture applied to Pencil

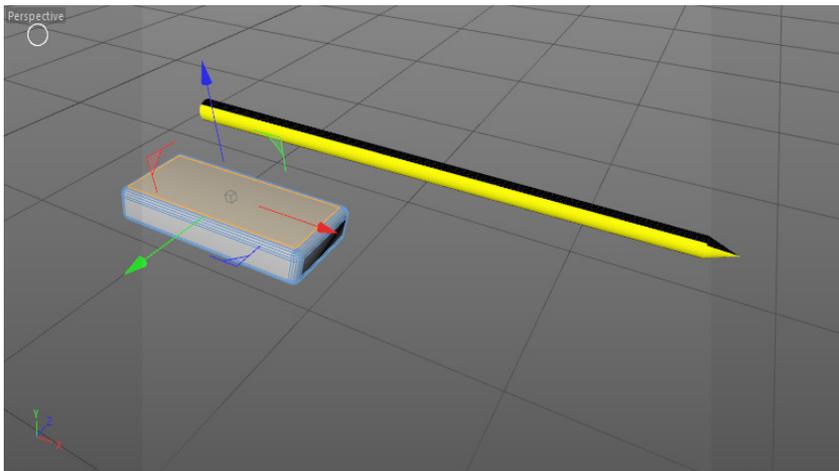


Figure 9-20 The top polygon of the Eraser selected

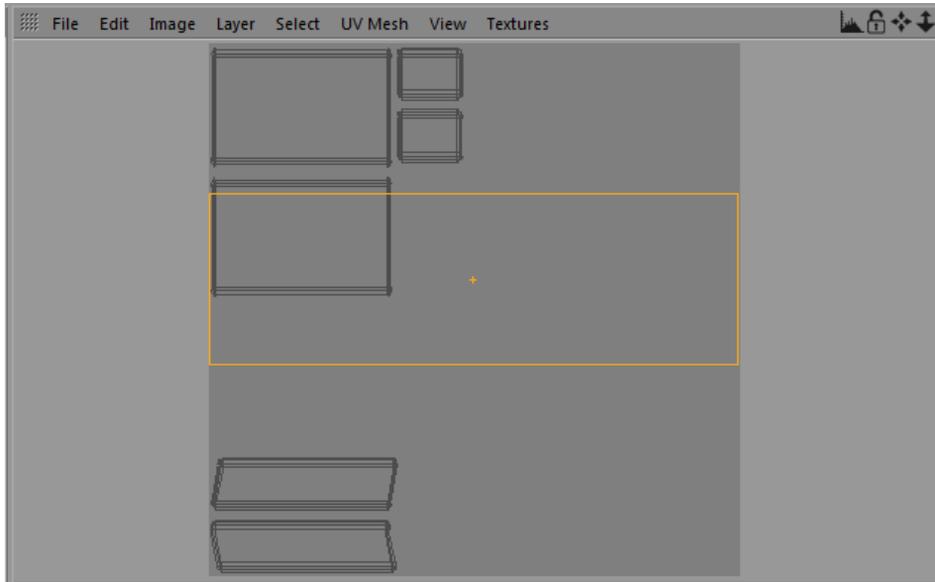


Figure 9-21 The top polygon aligned in the Texture View



Figure 9-22 The text placed inside the white outline

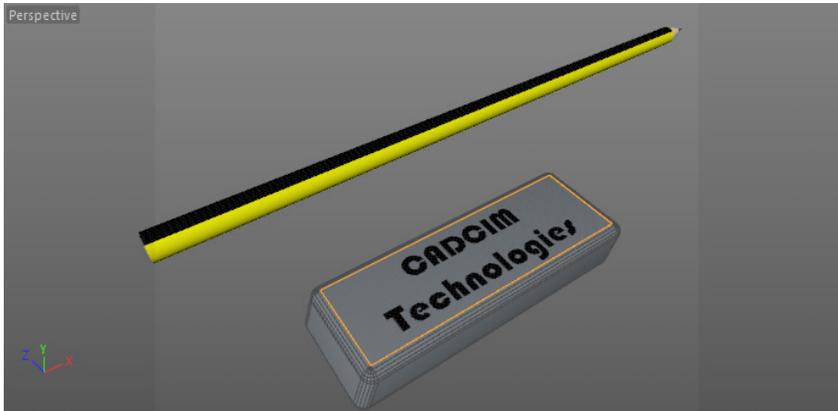


Figure 9-23 The texture applied to Eraser

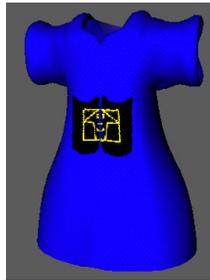


Figure 9-24 The final output

Chapter 10

Compositing 3D Objects

Learning Objectives

After completing this chapter, you will be able to:

- *Composite objects in a scene*
- *Work with the Camera Calibrator tag*



Figure 10-1 The final composition

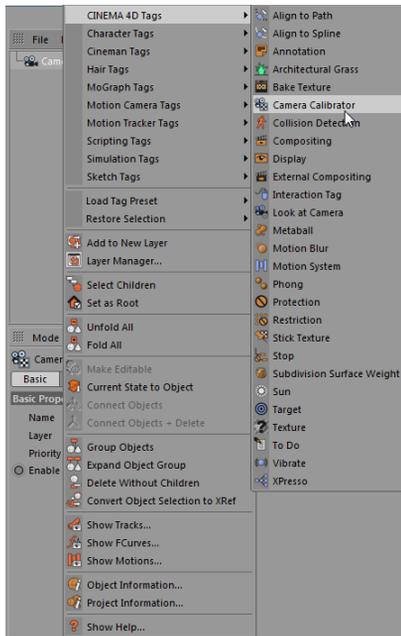


Figure 10-2 Choosing Camera Calibrator from the shortcut menu

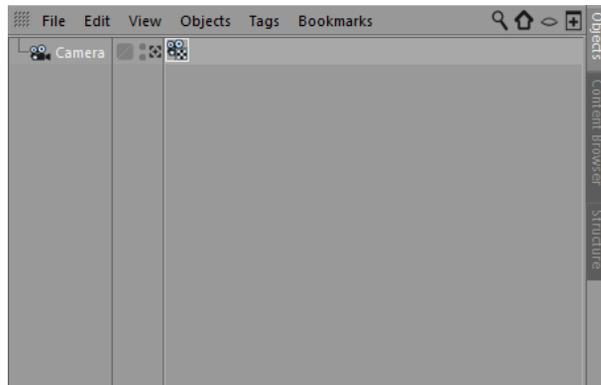


Figure 10-3 The Camera Calibrator tag added to the Object Manager

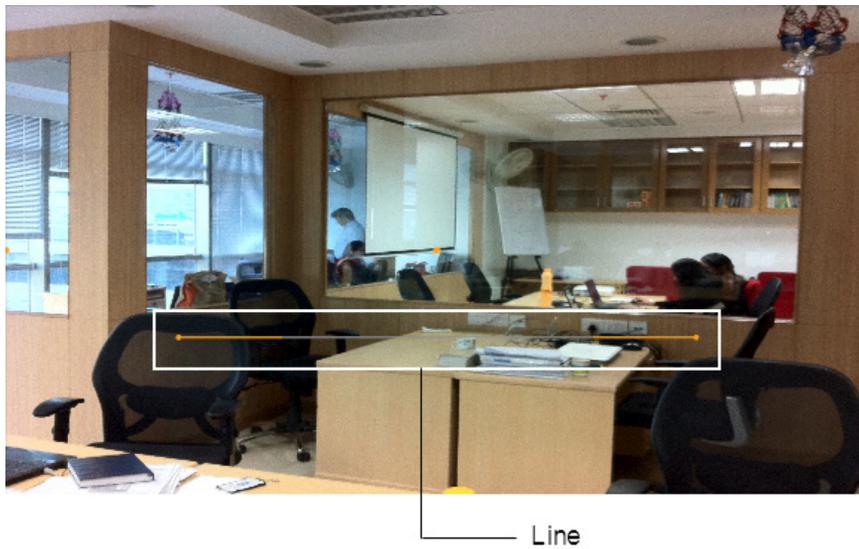


Figure 10-4 The line created in the Perspective viewport



Figure 10-5 The position of first line in the Perspective viewport



Figure 10-6 The position of second line in the Perspective viewport

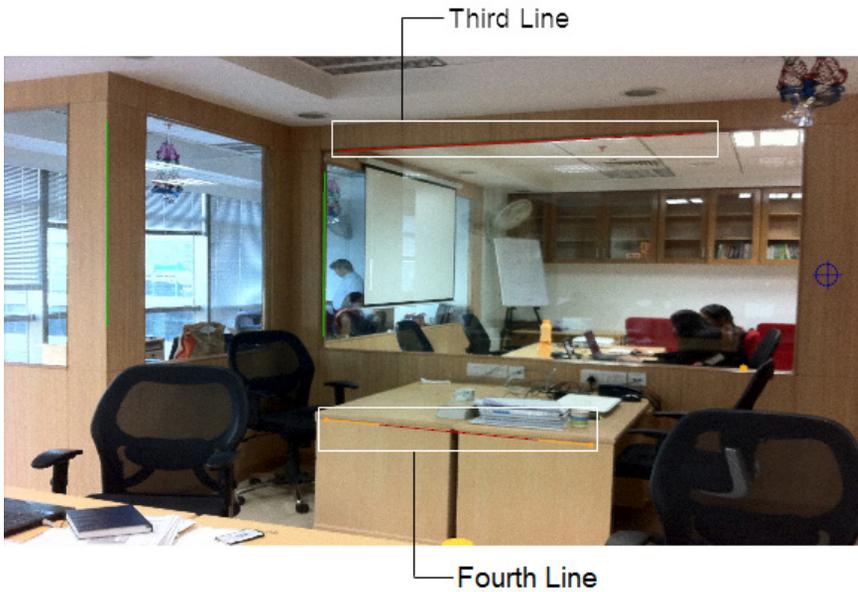


Figure 10-7 The two red lines representing the X-axis

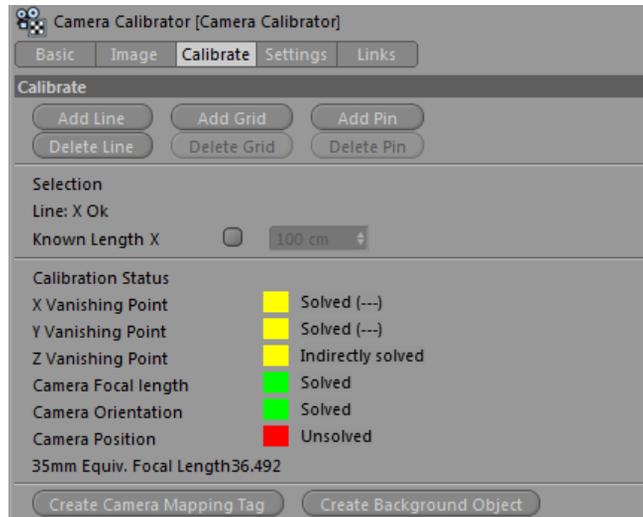


Figure 10-8 The focal length of the camera solved



Figure 10-9 The pin snapped to the fourth line in the scene

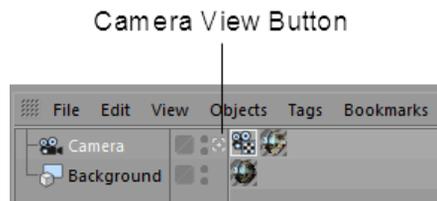


Figure 10-10 The Camera View button

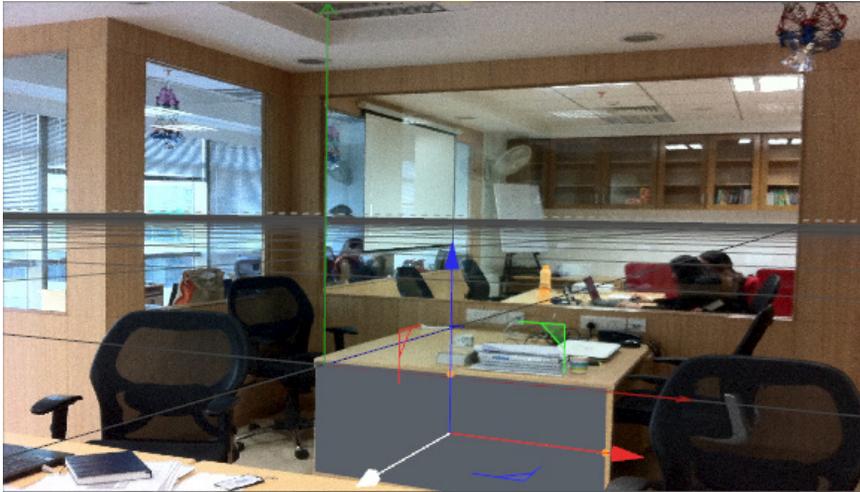


Figure 10-11 The plane positioned in the scene



Figure 10-12 The MoText displayed in the scene



Figure 10-13 The rendered scene



Figure 10-14 All objects in the Perspective viewport

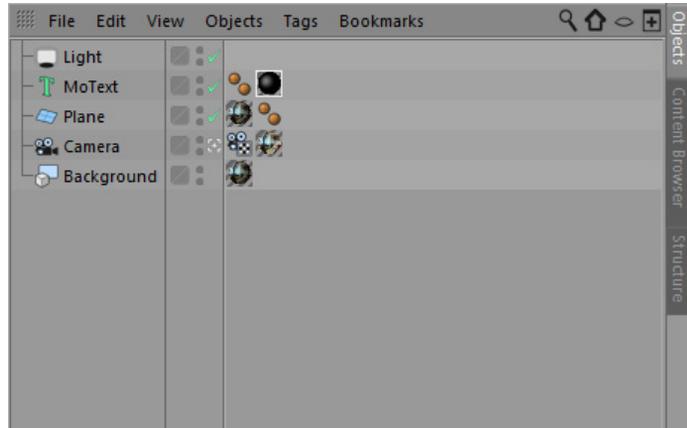


Figure 10-15 All objects in the Object Manager



Figure 10-16 The lines and pin in the scene



Figure 10-17 The 3D elements composited in the scene

Chapter 11

Rendering

Learning Objectives

After completing this chapter, you will be able to:

- *Understand Global Illumination*
- *Create render passes*
- *Create the caustic patterns*

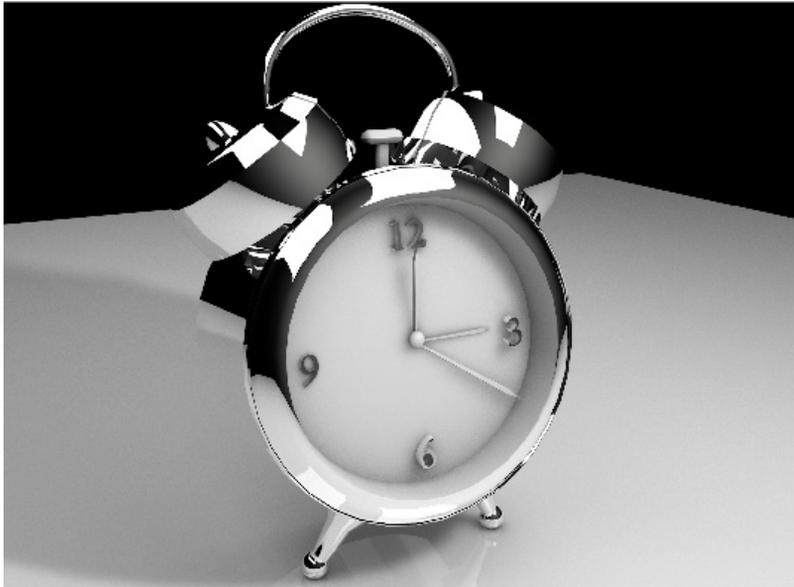


Figure 11-1 The final rendered table clock

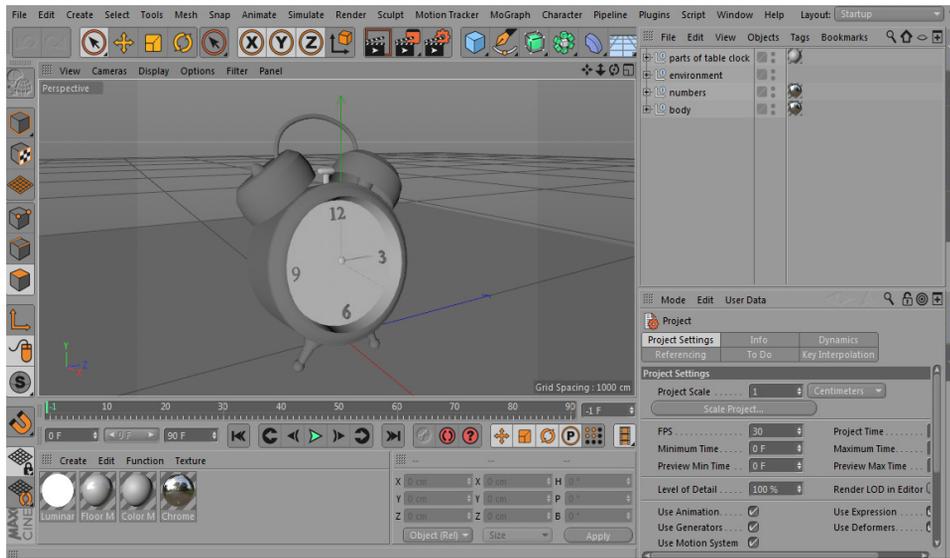


Figure 11-2 The c11_tut1_start.c4d file



Figure 11-3 Displaying the rendered view

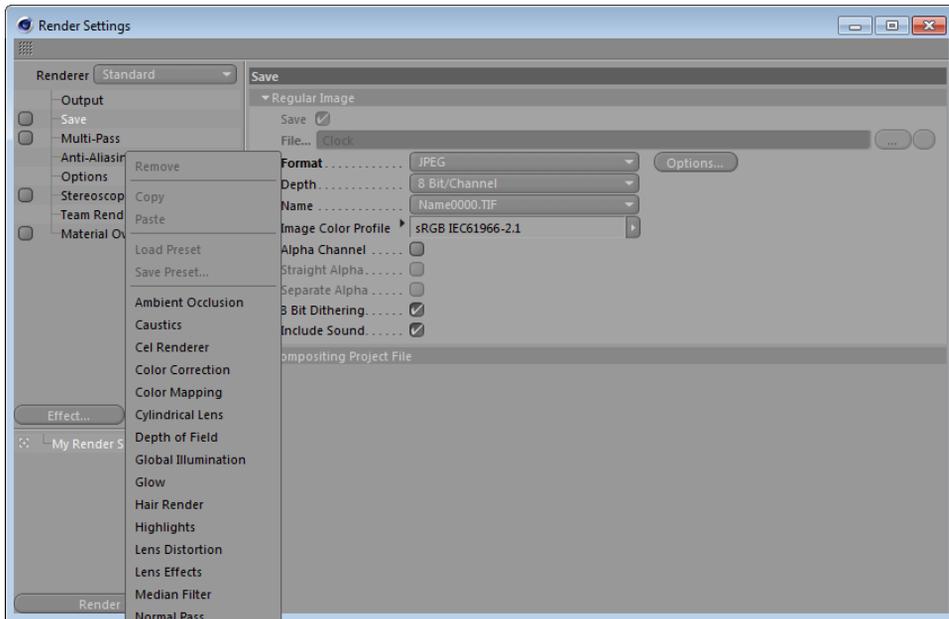


Figure 11-4 The flyout displayed on choosing the *Effect* button

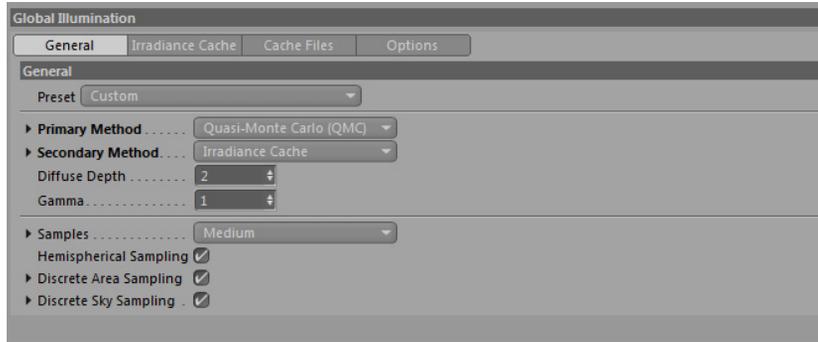


Figure 11-5 The Global Illumination area



Figure 11-6 The rendered clock



Figure 11-7 The rendered clock

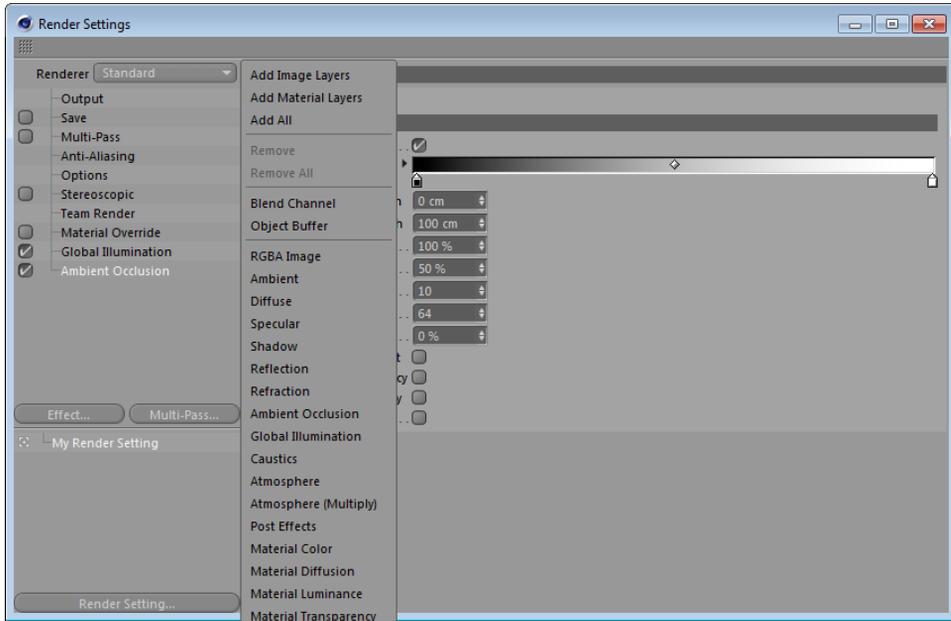


Figure 11-8 The flyout displayed on choosing the **Multi-Pass** button

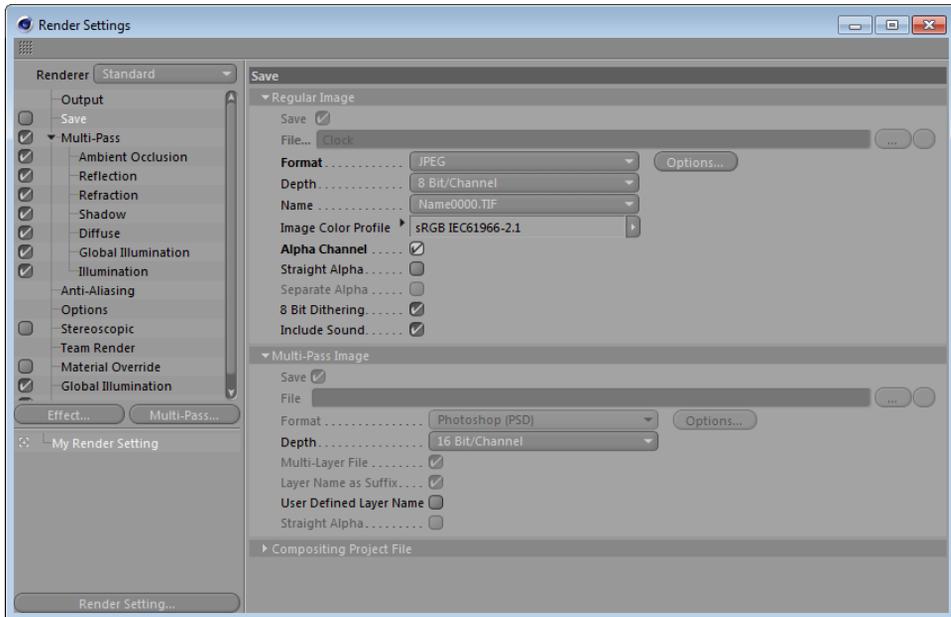
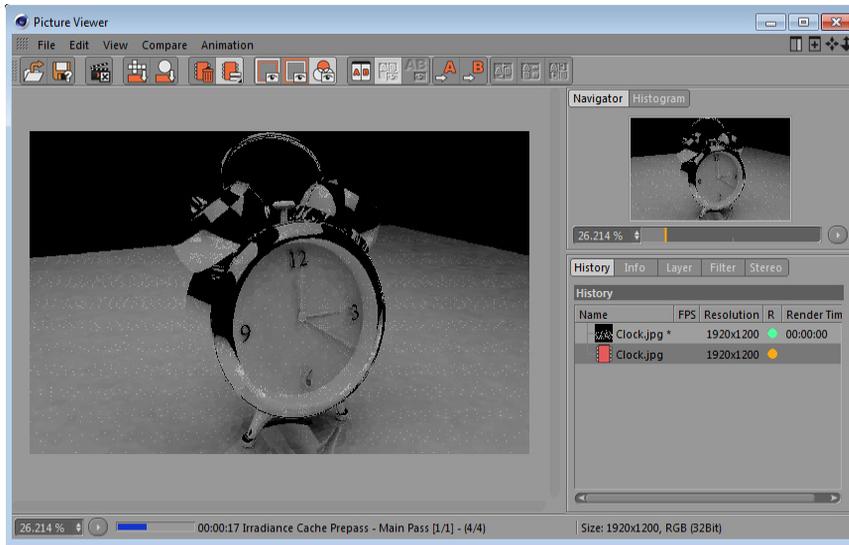
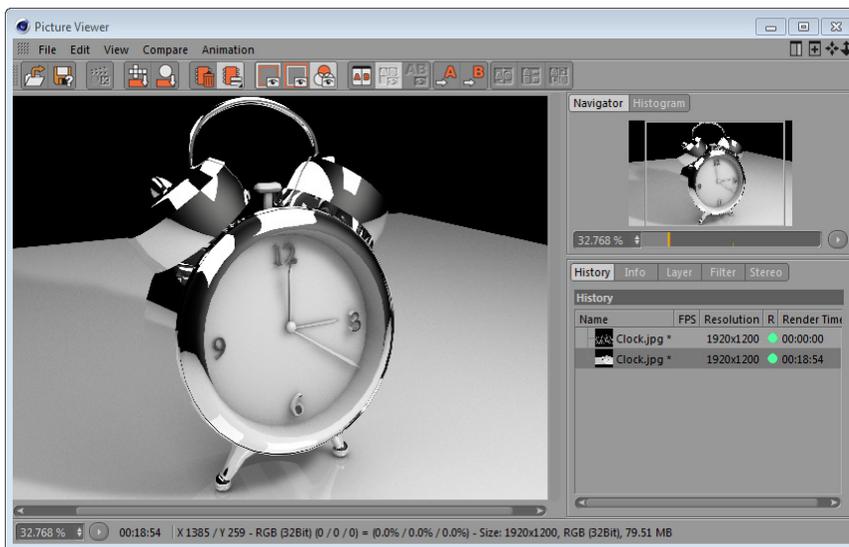


Figure 11-9 Selecting the **Alpha Channel** check box in the **Render Settings** window



*Figure 11-10 The rendering process in the **Picture Viewer** window*



*Figure 11-11 The render passes displayed in the **Picture Viewer** window*



Figure 11-12 Displaying the **Alpha** pass in the **Picture Viewer** window



Figure 11-13 The **Ambient Occlusion** pass displayed in the **Picture Viewer** window



Figure 11-14 The **Reflection** pass displayed in the **Picture Viewer** window

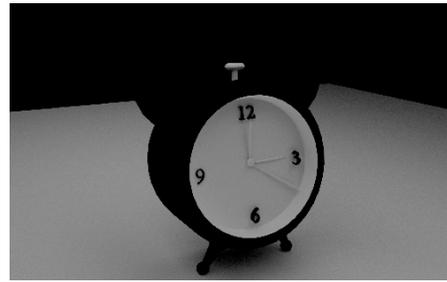


Figure 11-15 The **Global Illumination** pass displayed in the **Picture Viewer** window



Figure 11-16 The **Shadow** pass displayed in the **Picture Viewer** window

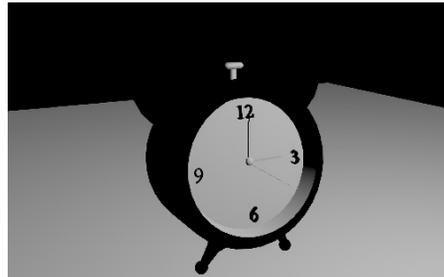


Figure 11-17 The **Diffuse** pass displayed in the **Picture Viewer** window



Figure 11-18 The render of the beer mug

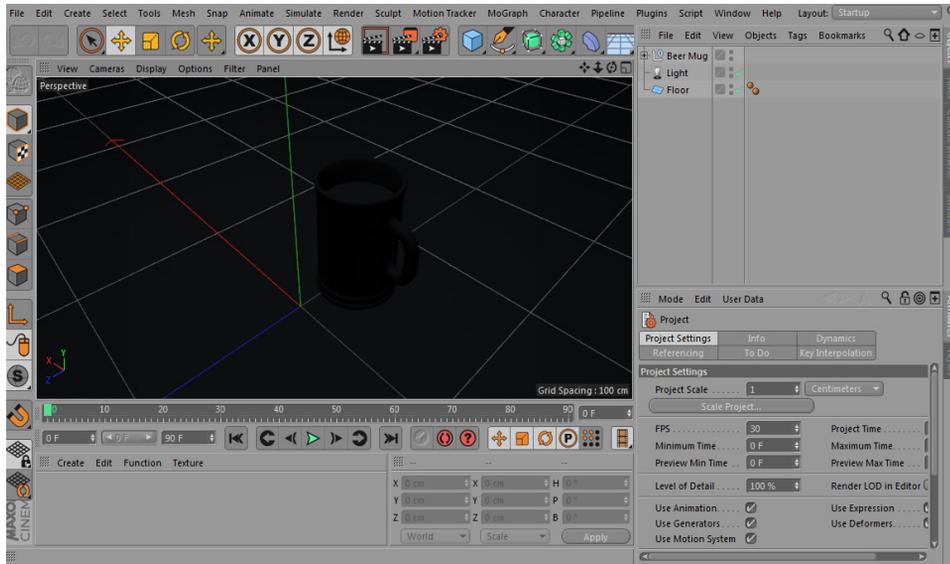


Figure 11-19 The c11_tut2_start.c4d file

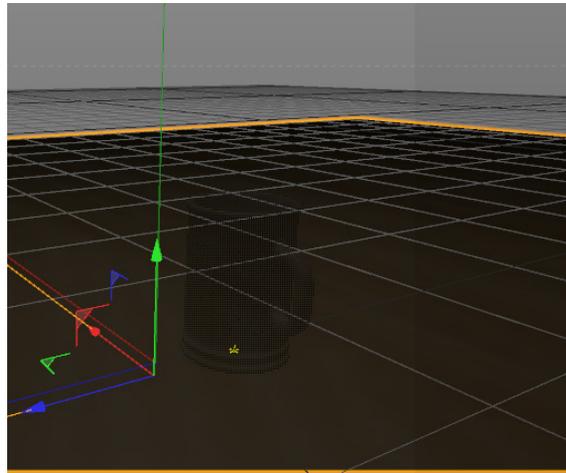


Figure 11-20 The floor texture applied

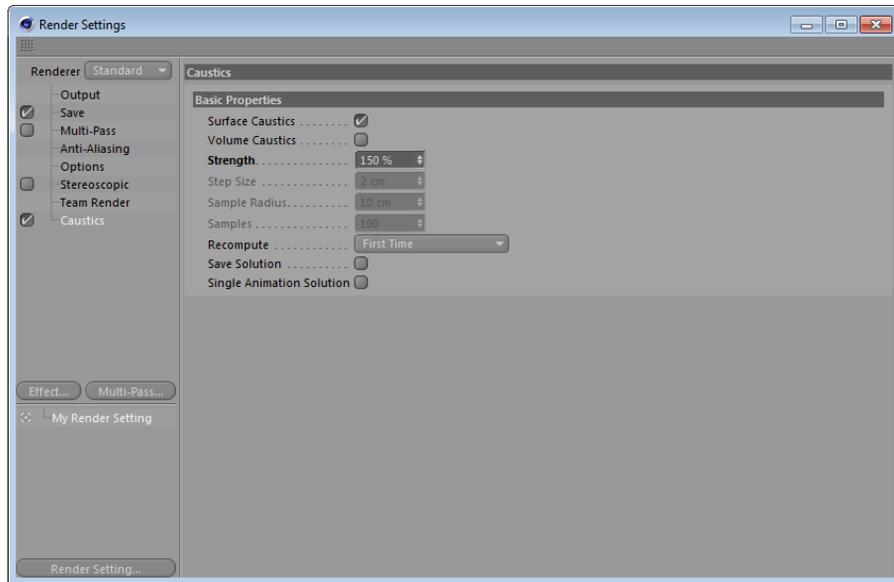


Figure 11-21 The Caustics area in the Render Settings window

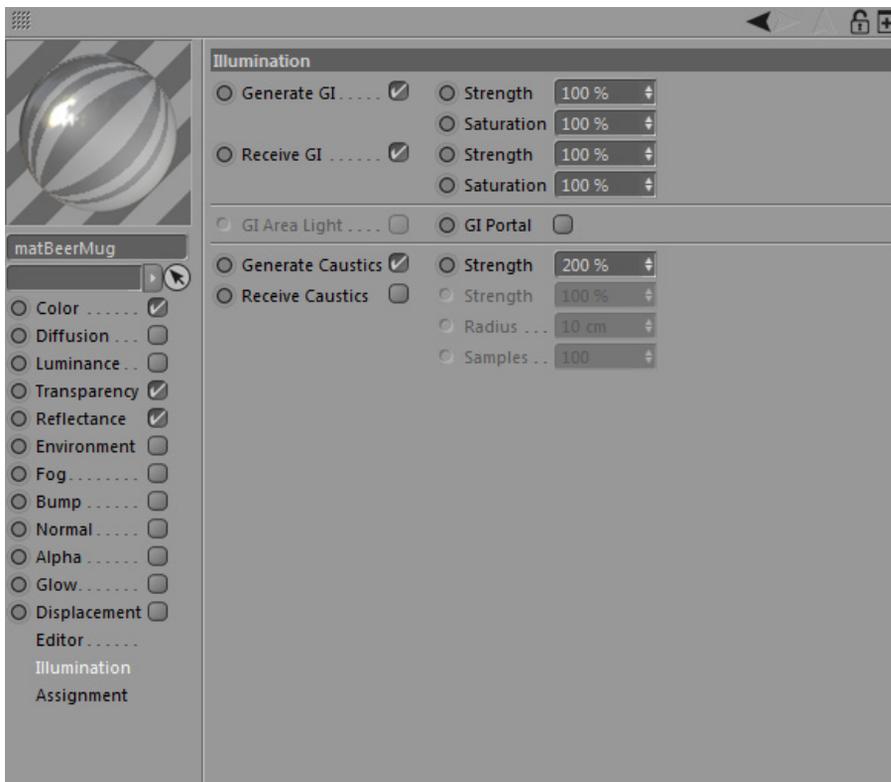


Figure 11-22 The Illumination area displayed in the Material Editor window



Figure 11-23 Scene after rendering

Chapter 12

MoGraph

Learning Objectives

After completing this chapter, you will be able to:

- *Create clones*
- *Add MoGraph effectors*
- *Create the shatter effect using PolyFX*
- *Work with the MoSpline object*

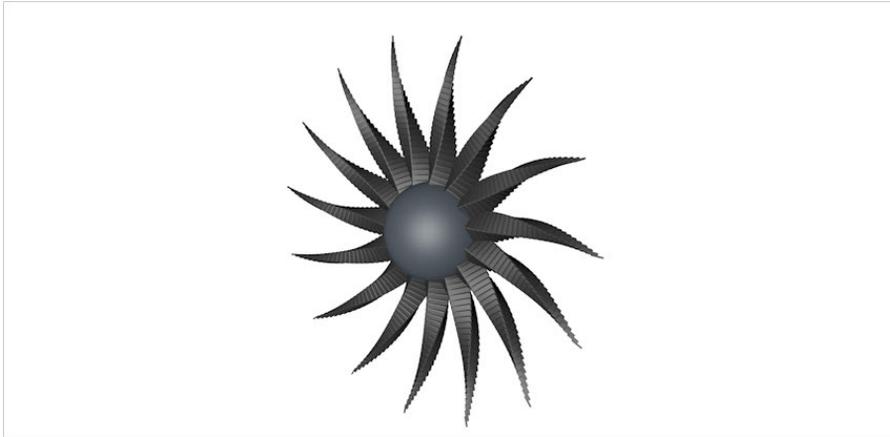


Figure 12-1 *The abstract model to be created*

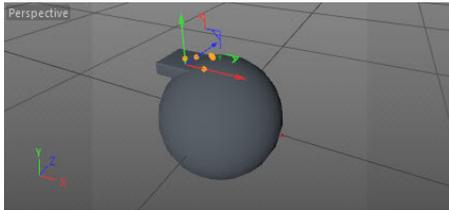


Figure 12-2 *Cube positioned in the Perspective viewport*

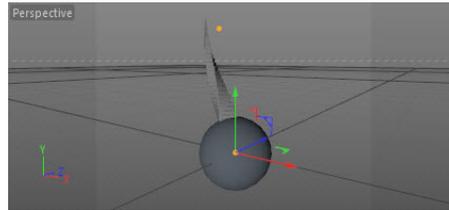


Figure 12-3 *Cloner displayed in the Perspective viewport*

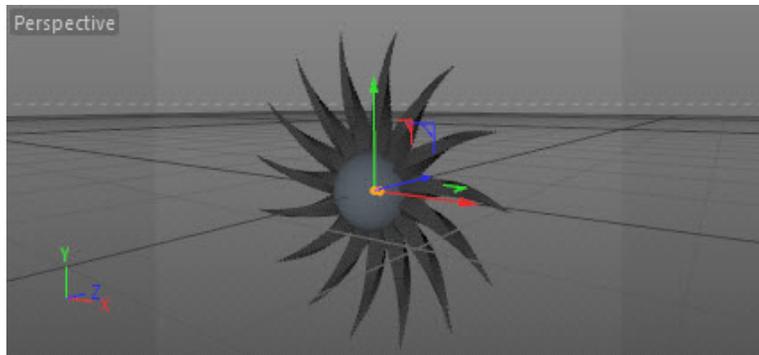


Figure 12-4 *Cloner.1 displayed in the Perspective viewport*

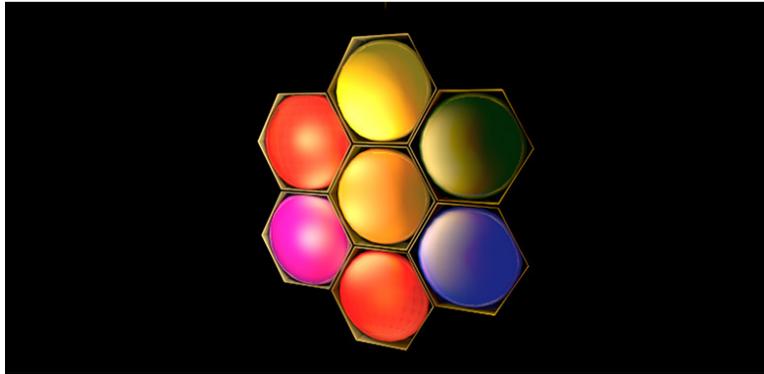


Figure 12-5 The disco light effect at frame 60

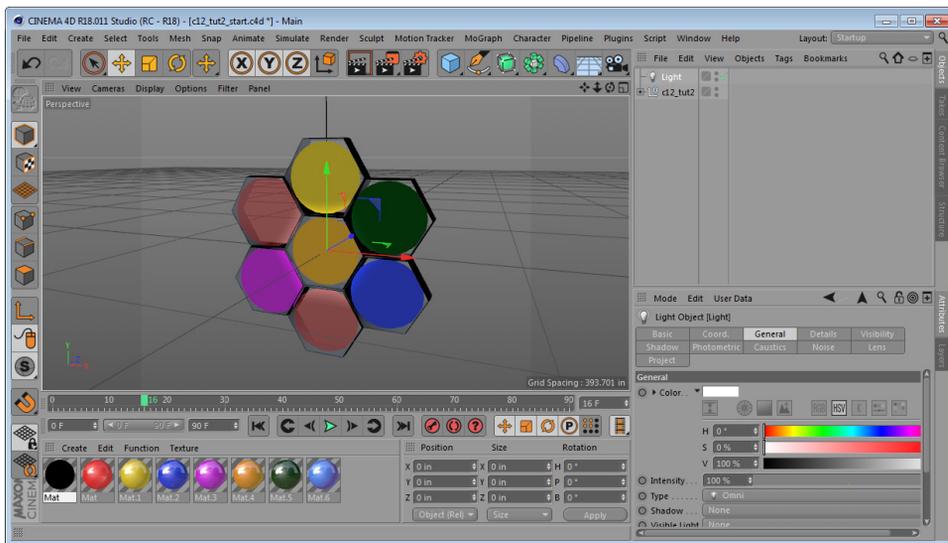


Figure 12-6 The c12_tut2_start.c4d file

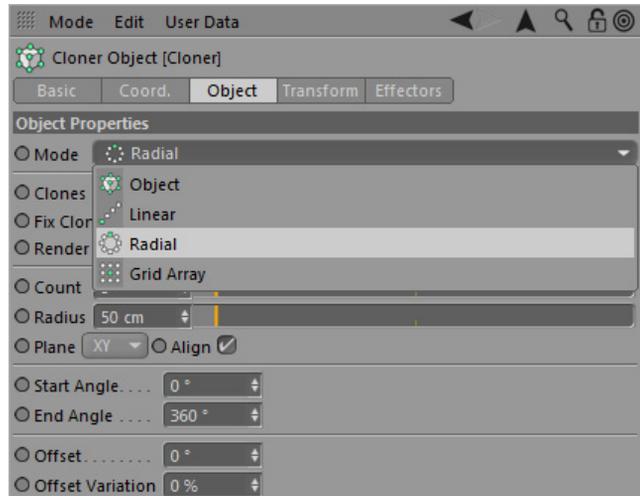


Figure 12-7 Selecting **Radial** from the **Mode** drop-down list

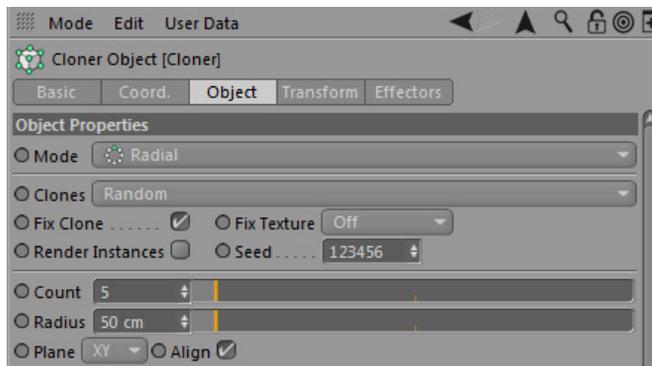


Figure 12-8 Selecting **Random** from the **Clones** drop-down list

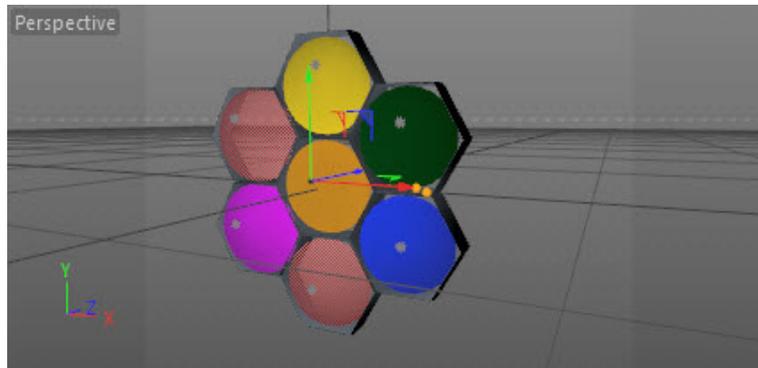


Figure 12-9 The clones of **Light** displayed in the **Perspective** viewport

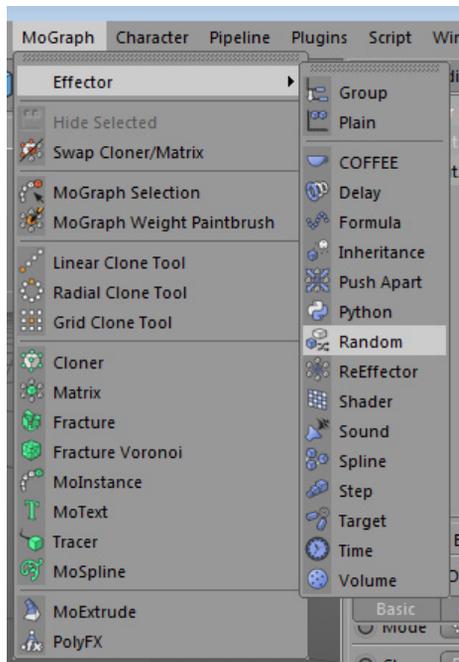


Figure 12-10 Choosing **Random** from the cascading menu

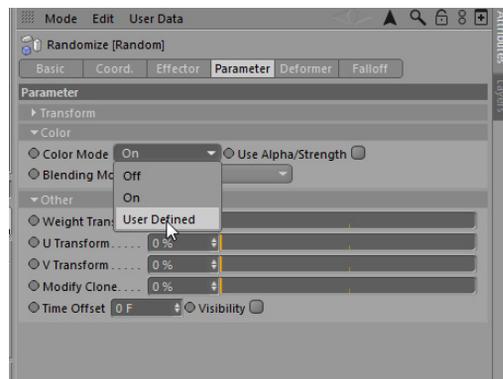


Figure 12-11 Selecting the **User Defined** option from the **Color Mode** drop-down list

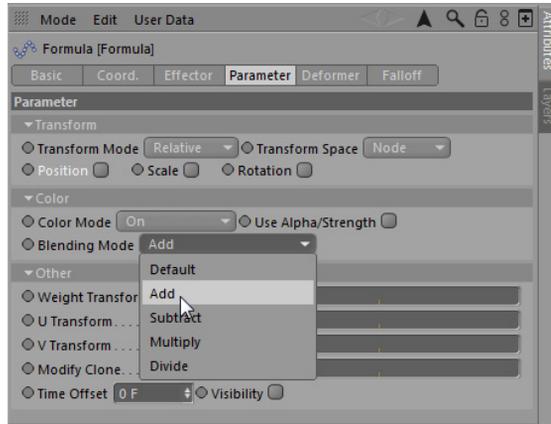


Figure 12-12 Selecting the *Add* option from the *Blending Mode* drop-down list

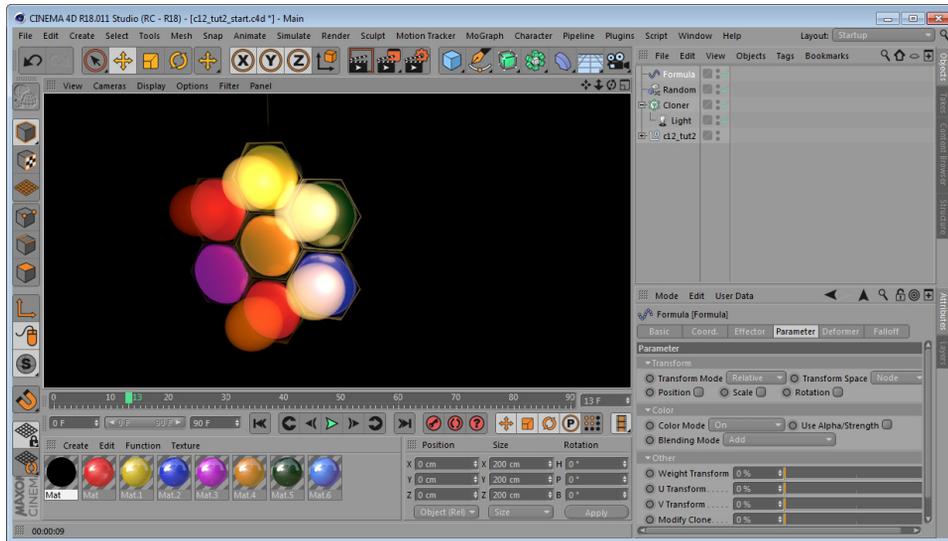


Figure 12-13 The rendered view at the current frame



Figure 12-14 The shattering effect at frame 81

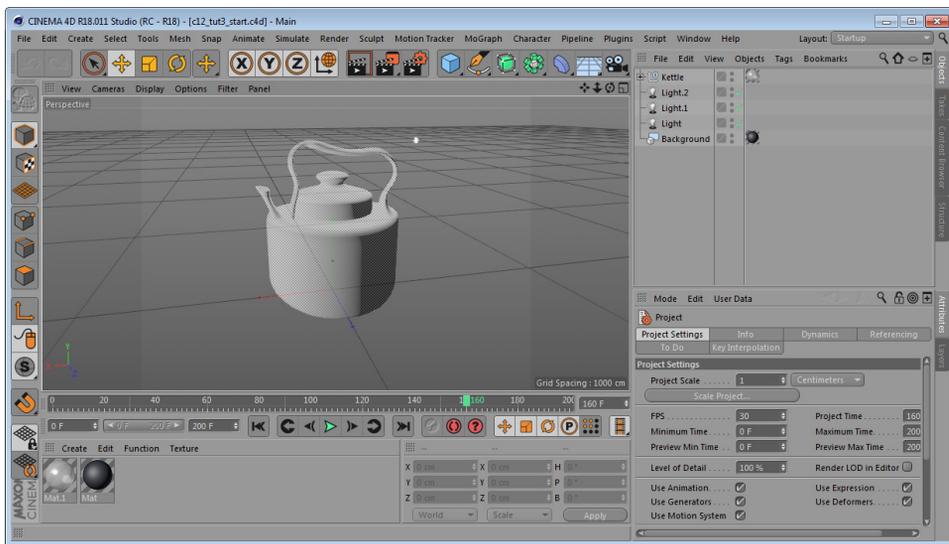


Figure 12-15 The c12_tut3_start.c4d file

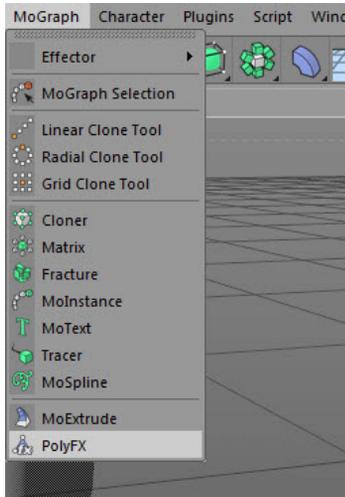


Figure 12-16 Choosing **PolyFX** from the main menu

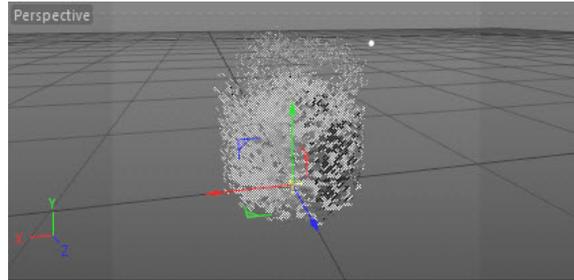


Figure 12-17 The fragmented Kettle in the Perspective viewport

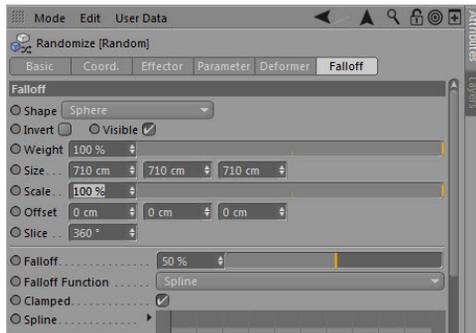


Figure 12-18 The **Falloff** area

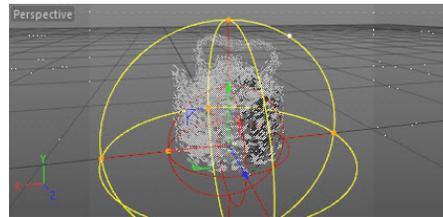


Figure 12-19 The **Random** effector displayed in the Perspective viewport

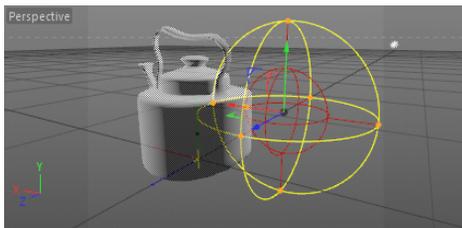


Figure 12-20 Random effector at frame 0

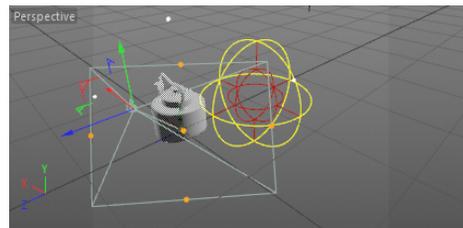


Figure 12-21 The target camera created in the Perspective viewport

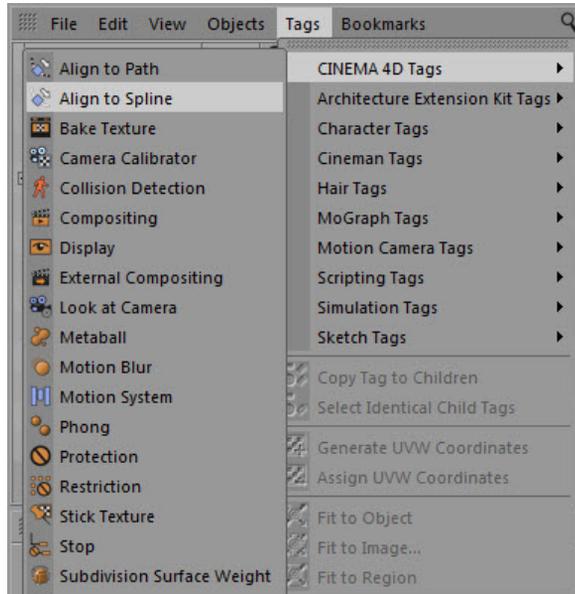


Figure 12-22 Choosing *Align to Spline* from the cascading menu

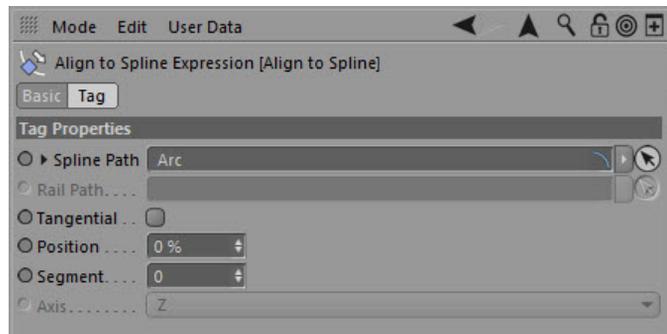


Figure 12-23 Arc added to the *Spline Path* text box



Figure 12-24 The rendered view at a frame

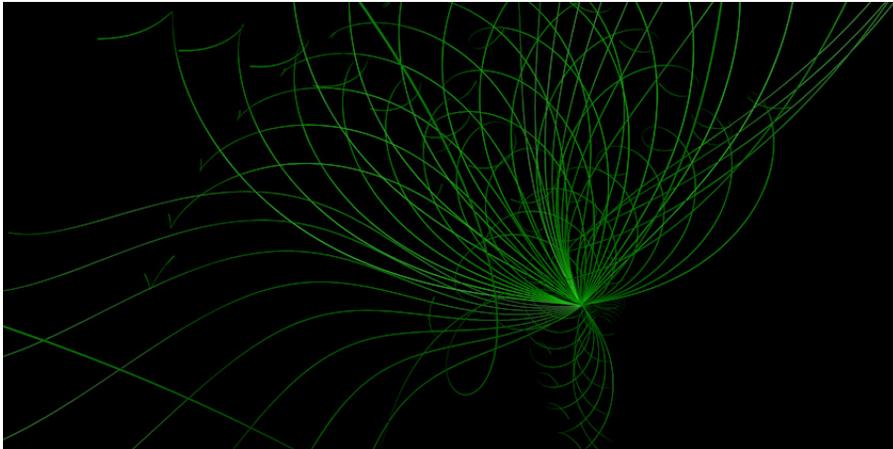


Figure 12-25 The abstract animation at frame 0

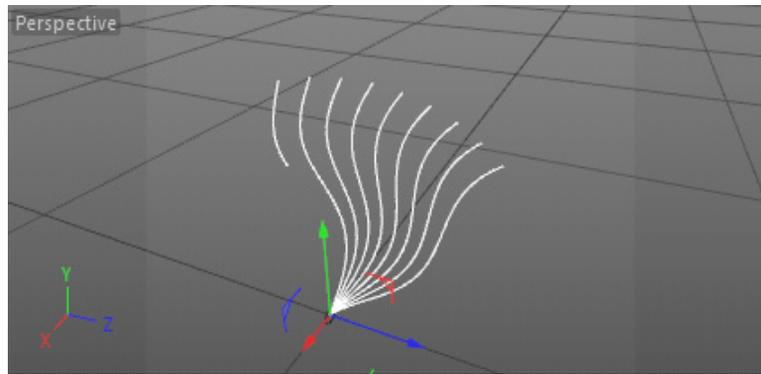


Figure 12-26 The MoSpline displayed in the Perspective viewport

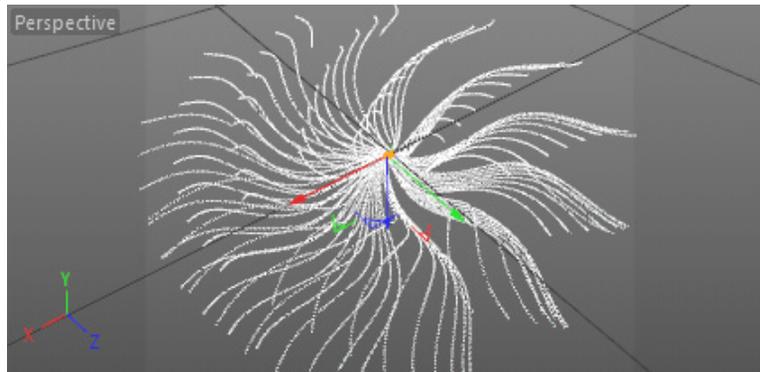


Figure 12-27 The clones displayed in the Perspective viewport

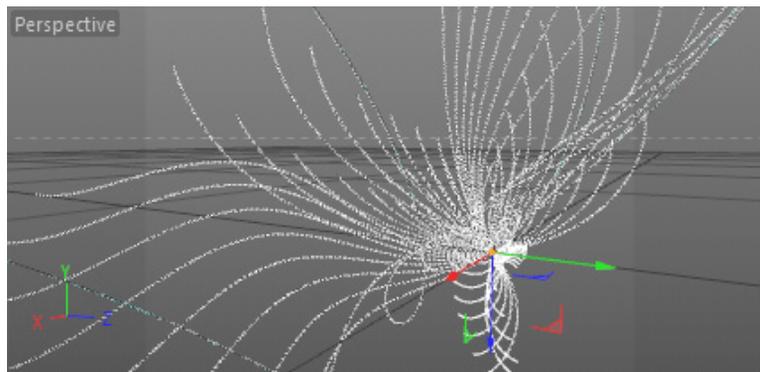


Figure 12-28 The clones displayed in the viewport

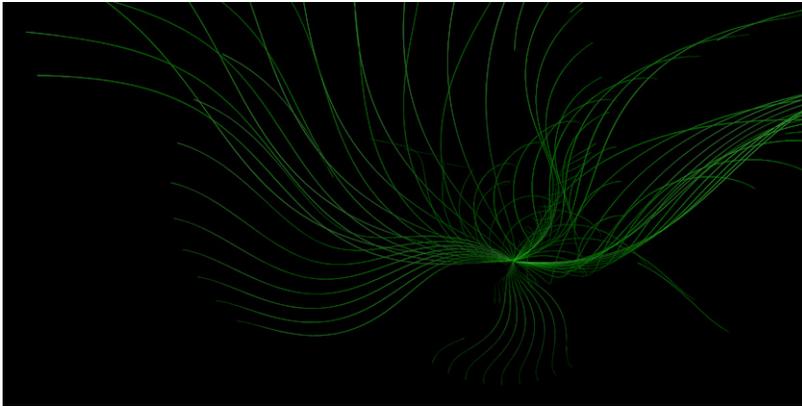


Figure 12-29 The rendered image at frame 48

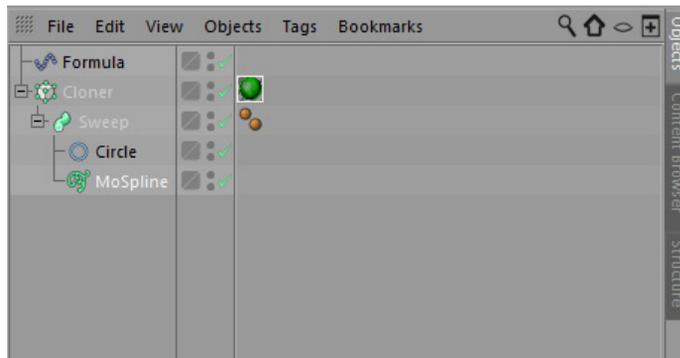


Figure 12-30 The objects in the Object Manager

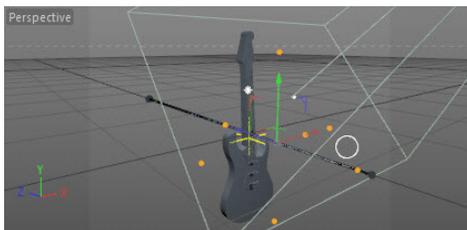


Figure 12-31 The guitar model



Figure 12-32 The model at frame 20

Chapter 13

Working with XPresso

Learning Objectives

After completing this chapter, you will be able to:

- *Work with the XPresso Editor*
- *Create and connect nodes*
- *Modify settings of nodes*

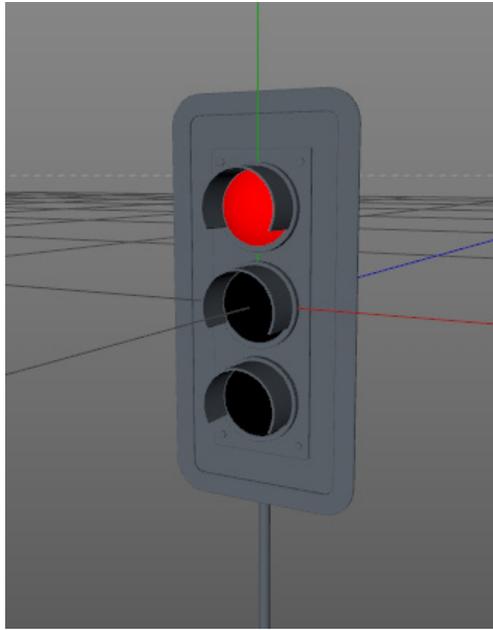


Figure 13-1 The traffic signal with the red light on

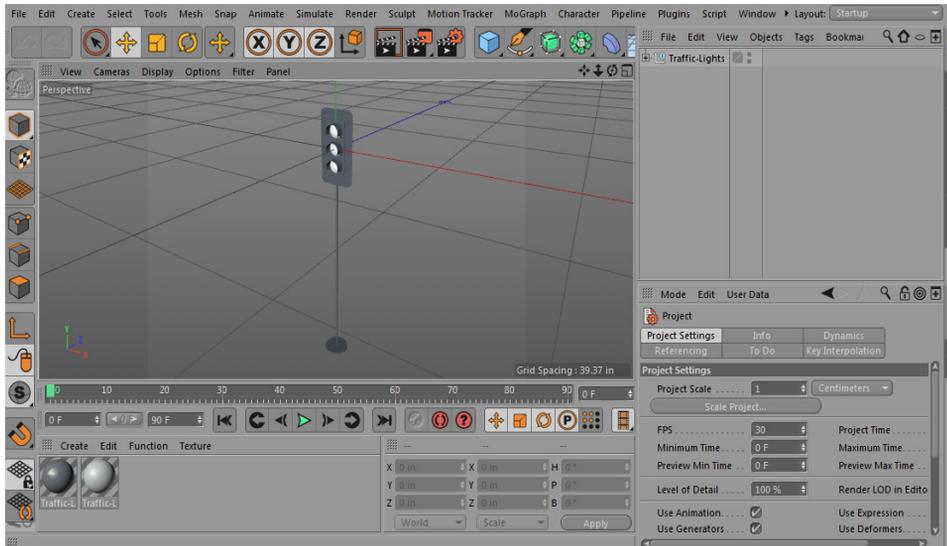


Figure 13-2 The c13_tut1_start.c4d file

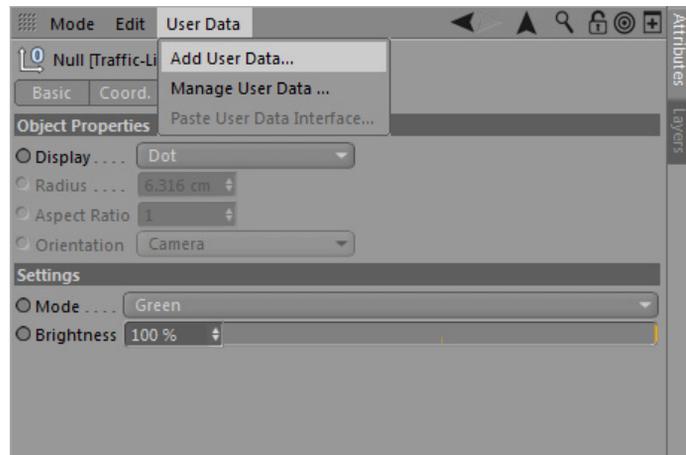


Figure 13-3 Choosing **Add User Data** from the menu in the Attribute Manager

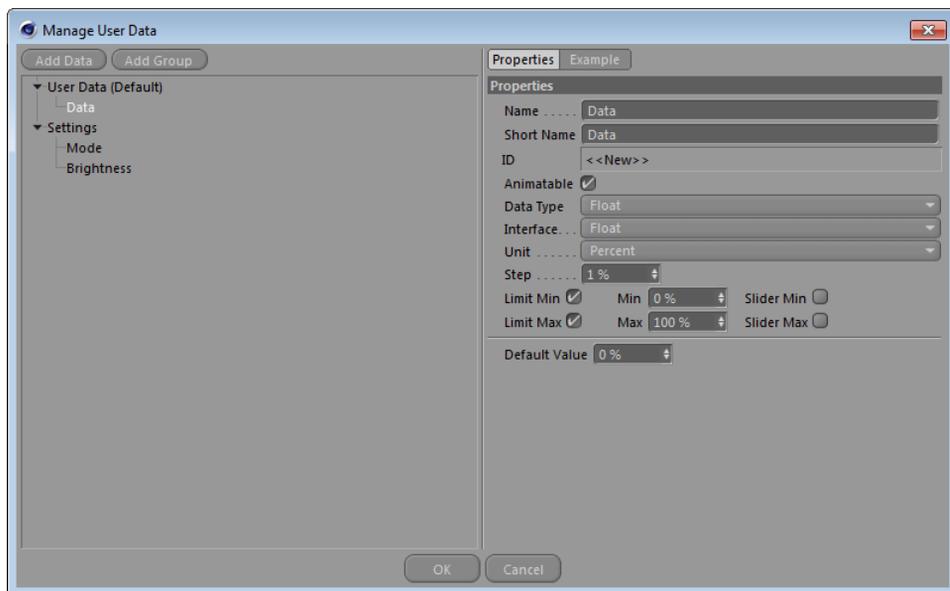


Figure 13-4 The **Manage User Data** dialog box

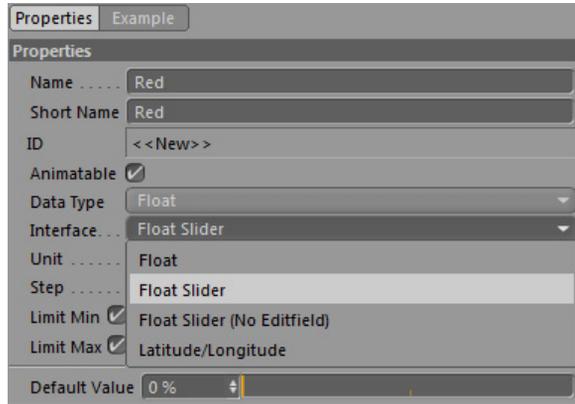


Figure 13-5 Selecting **Float Slider** from the **Interface** drop-down list

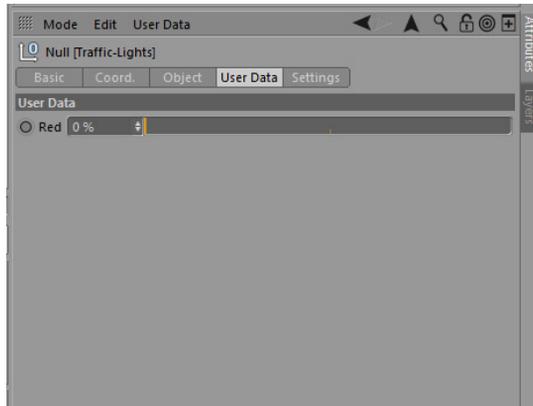


Figure 13-6 The **Red** spinner added to the **User Data** area in the **Attribute Manager**

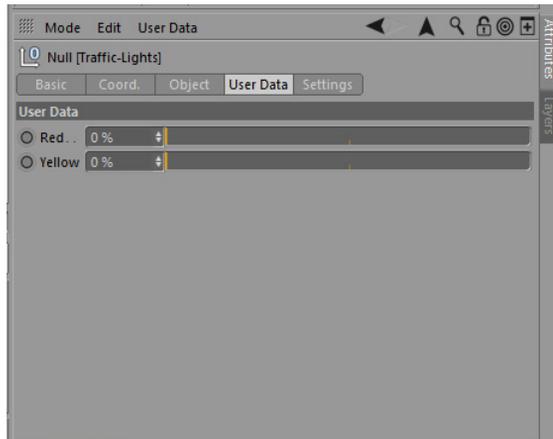


Figure 13-7 The **Yellow** spinner added to the **User Data** area in the **Attribute Manager**

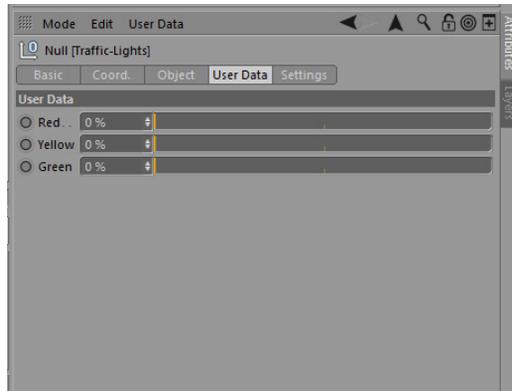


Figure 13-8 The **Green** spinner added to the **User Data** area in the **Attribute Manager**

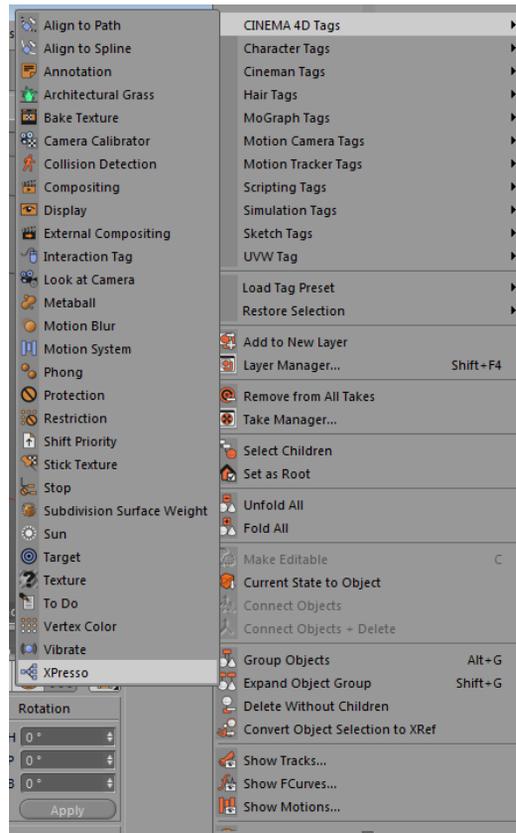


Figure 13-9 Choosing **XPresso** from the shortcut menu

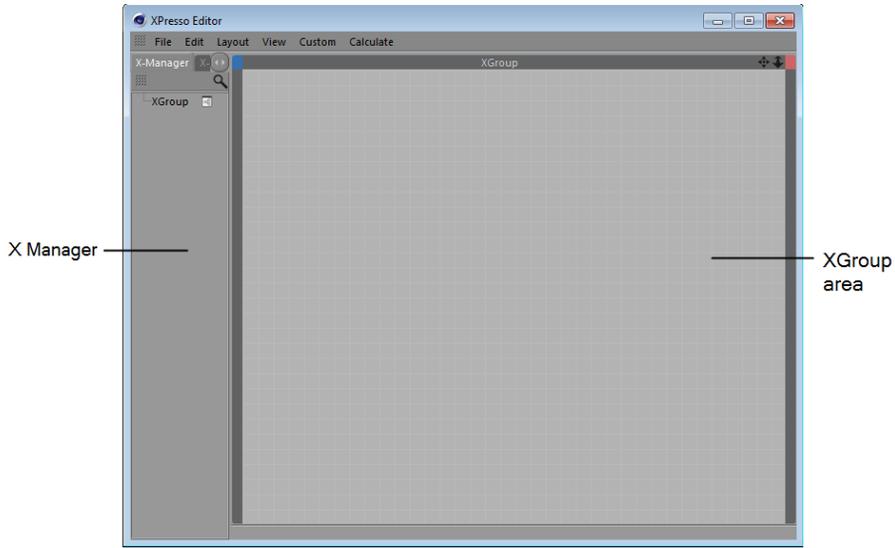


Figure 13-10 The XPresso Editor

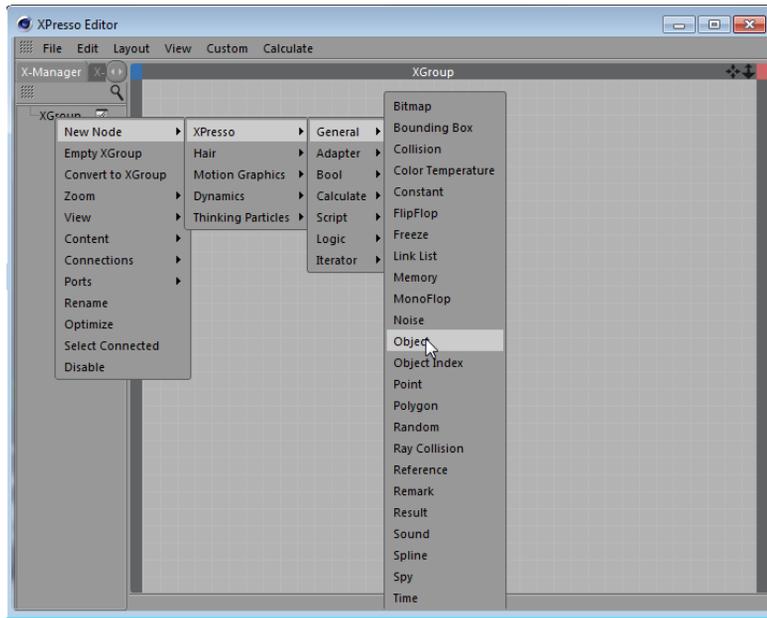


Figure 13-11 Choosing **Object** from the shortcut menu

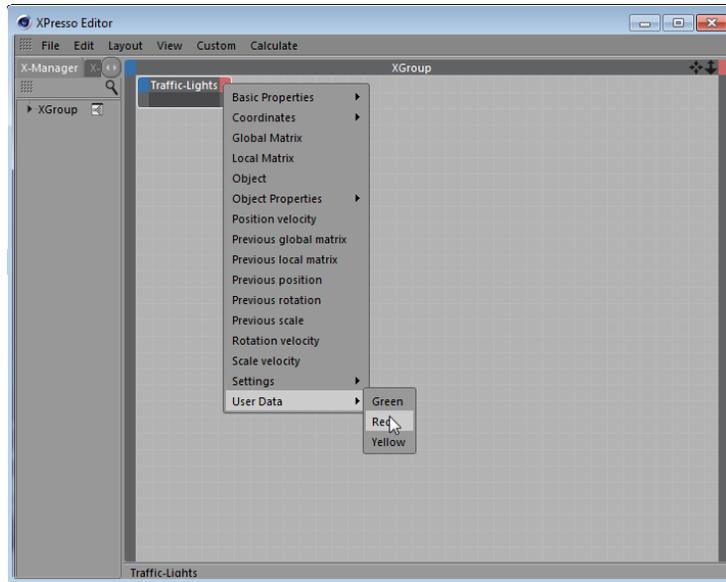


Figure 13-12 Choosing **Red** from the flyout in the **XPresso Editor**

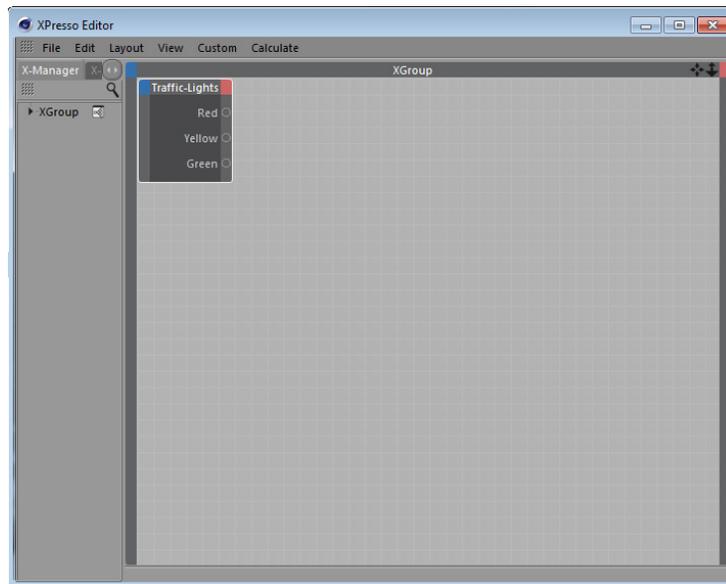


Figure 13-13 The **Red**, **Yellow**, and **Green** output ports added to the **Traffic-Lights** node

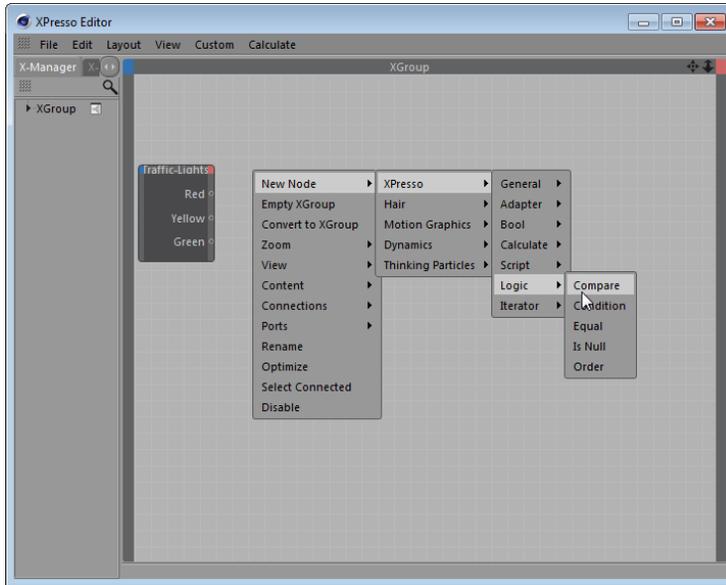


Figure 13-14 Choosing the **Compare** option from the shortcut menu in the **XPresso Editor**

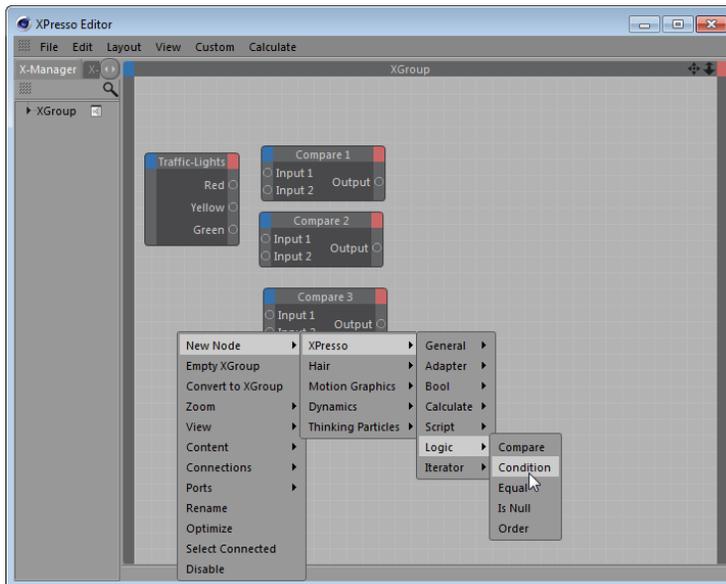


Figure 13-15 Choosing the **Condition** option from the shortcut menu in the **XPresso Editor**

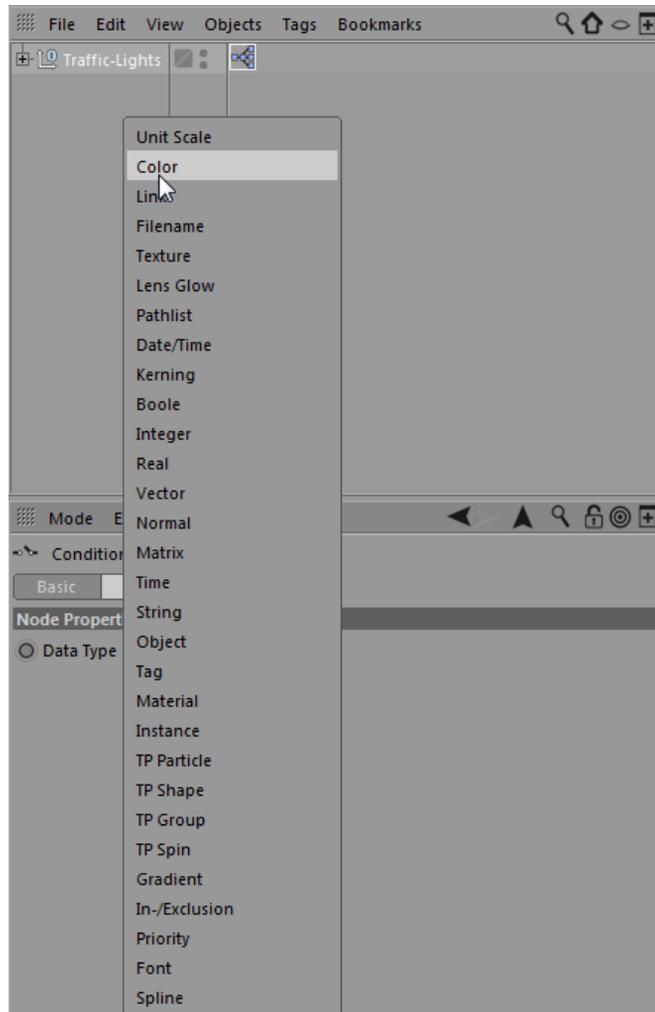


Figure 13-16 Selecting **Color** from the **Data Type** drop-down list in the **Node Properties** area

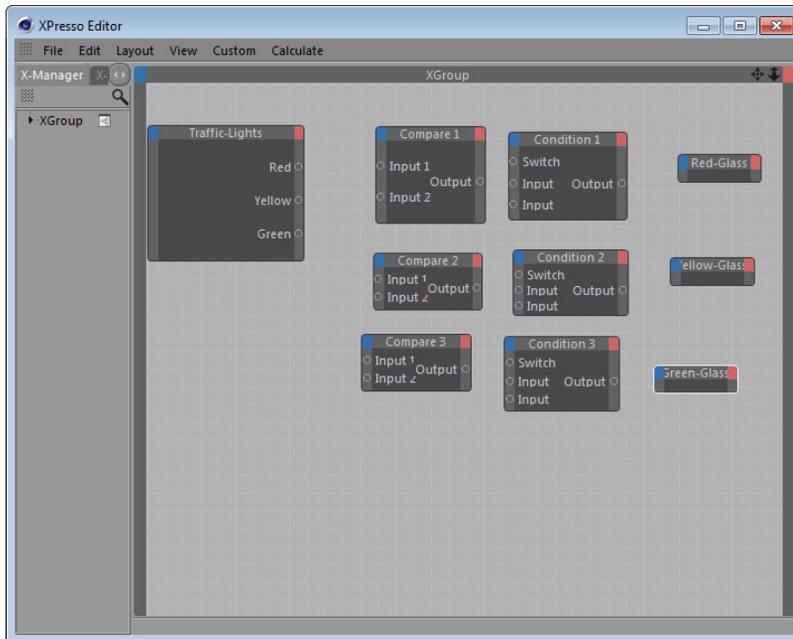


Figure 13-17 The Red-Glass, Yellow-Glass, and Green-Glass nodes added in the XPresso Editor

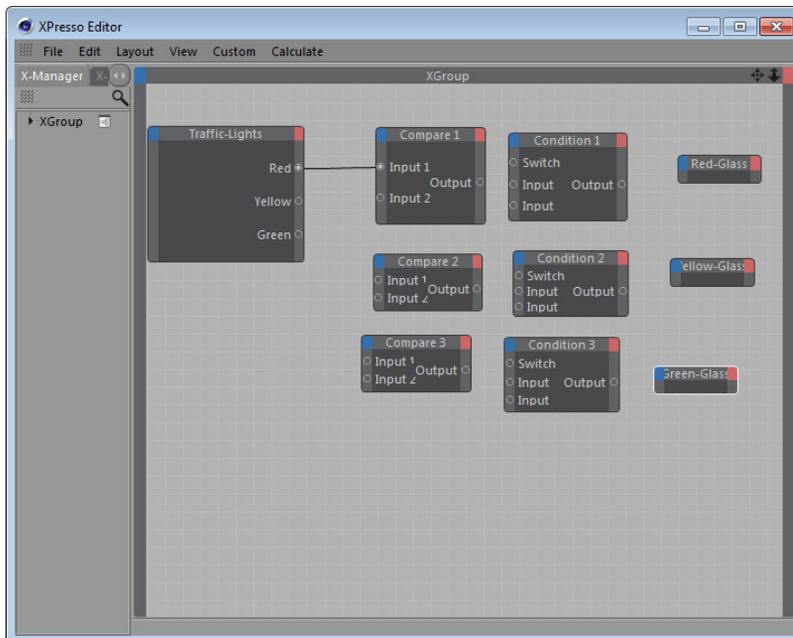


Figure 13-18 Connection established between the Red output port of the Traffic-Lights and Compare 1 nodes

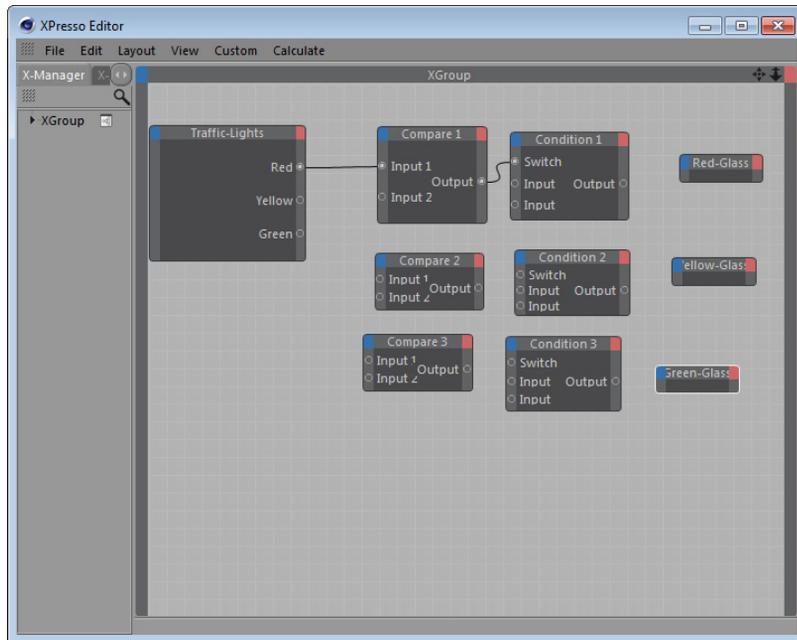


Figure 13-19 Connection established between the *Compare 1* and *Condition 1* nodes

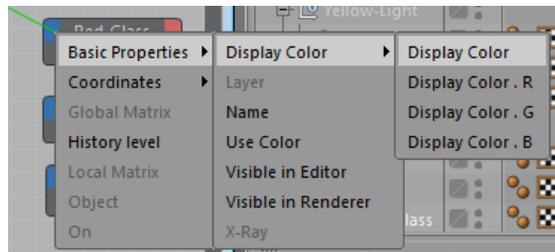


Figure 13-20 Choosing *Display Color* from the flyout in the XPresso Editor

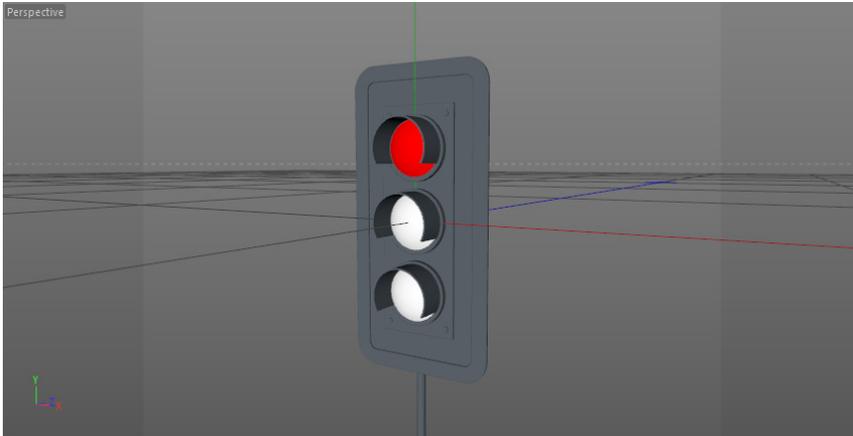
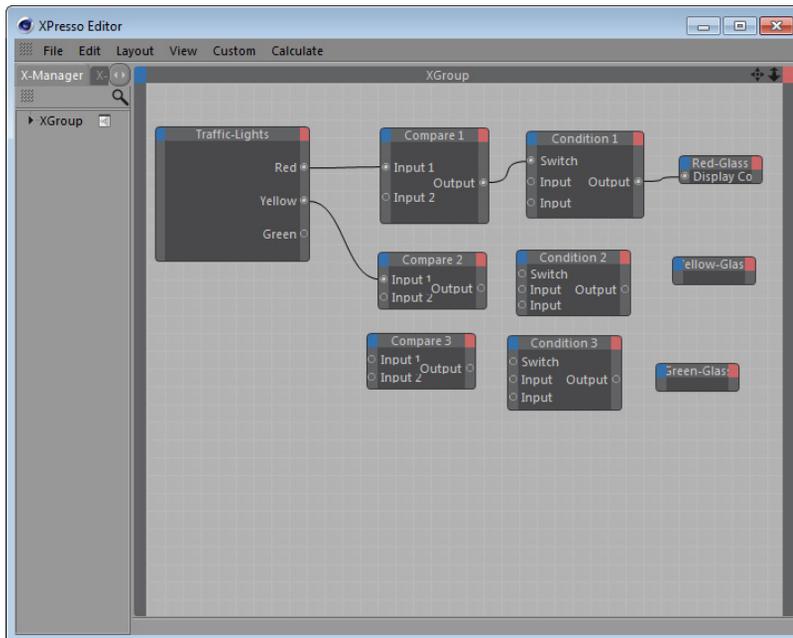


Figure 13-21 The red light activated in the Perspective viewport



*Figure 13-22 Connection established between the **Yellow** output port of the **Traffic -Lights** and **Compare 2** nodes*

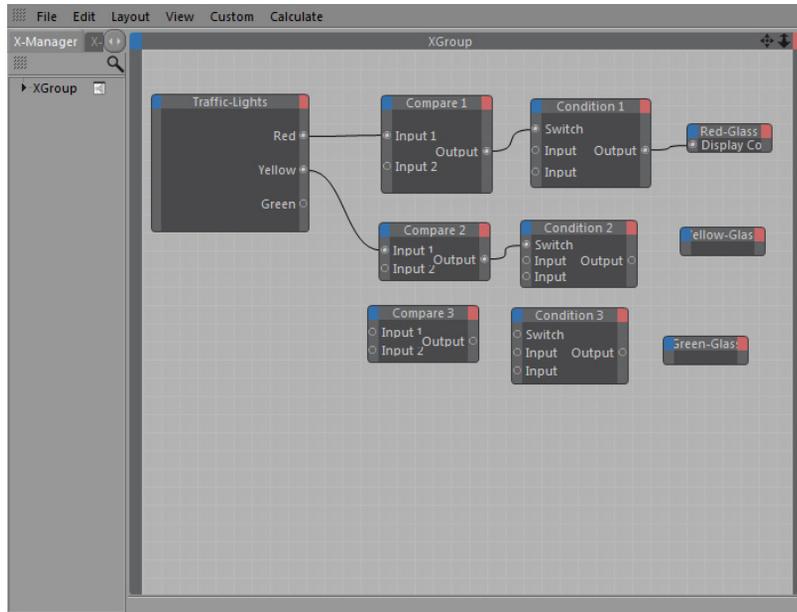


Figure 13-23 Connection established between the *Compare 2* and *Condition 2* nodes

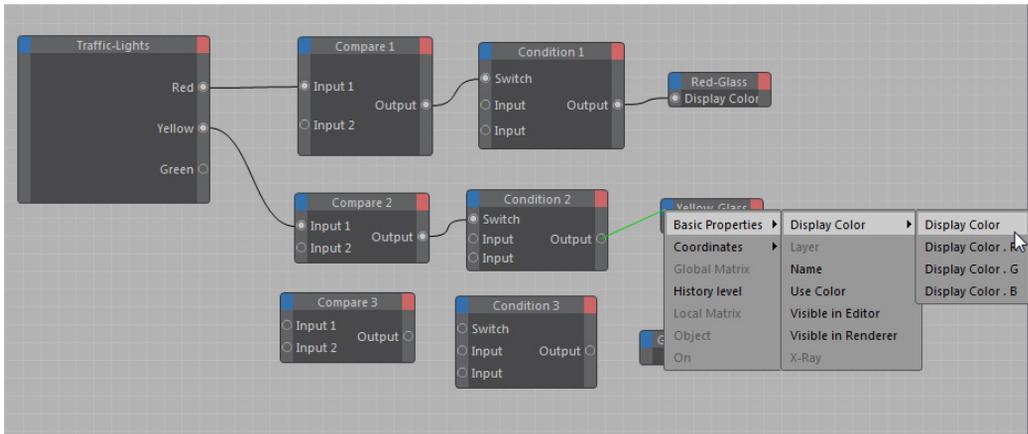


Figure 13-24 Choosing *Display Color* from the flyout in the XPresso Editor

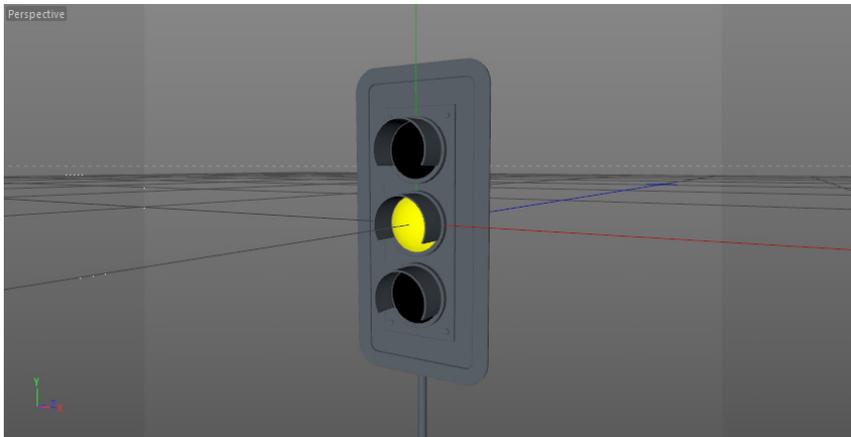


Figure 13-25 The yellow light activated in the Perspective viewport

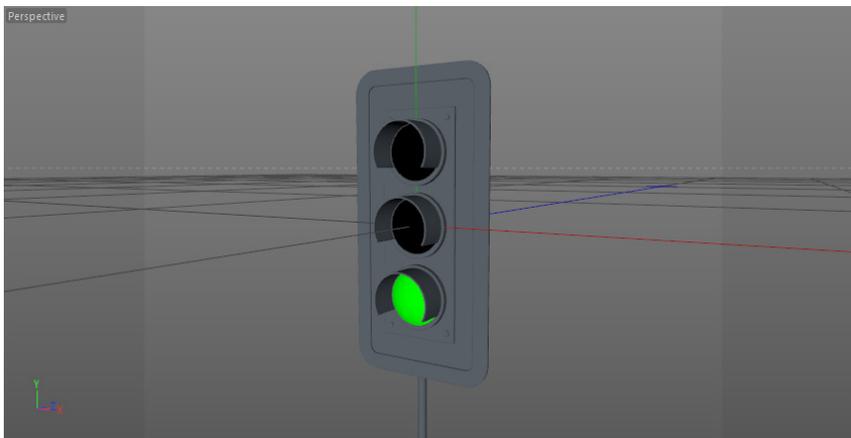


Figure 13-26 The green light activated in the Perspective viewport

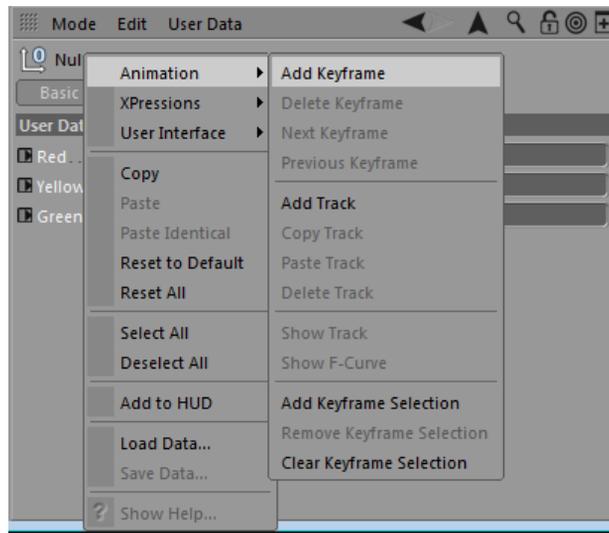


Figure 13-27 The shortcut menu displayed on right-clicking in the *User Data* area

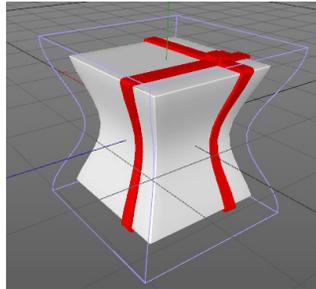


Figure 13-28 The deformed object

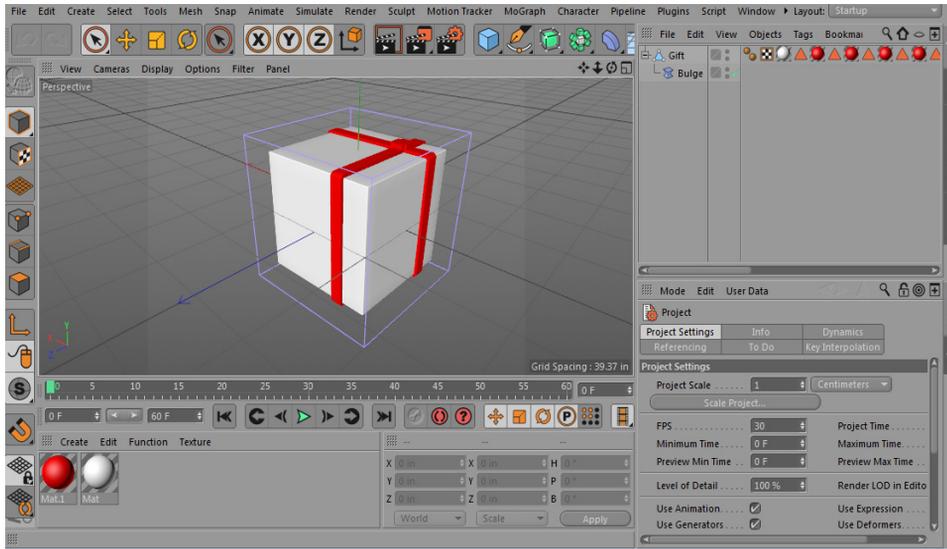


Figure 13-29 The c13_tut2_start.c4d file

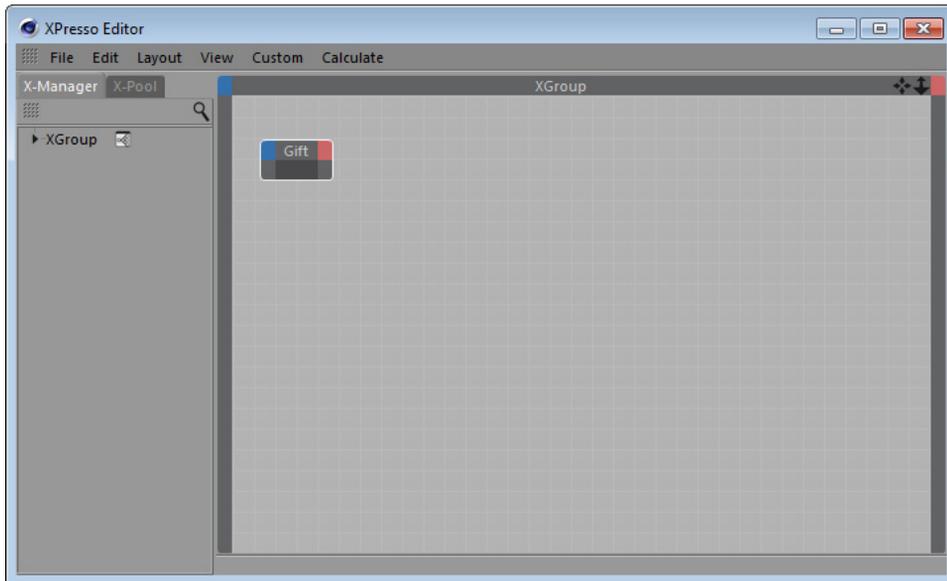


Figure 13-30 The Gift node added in the XPresso Editor

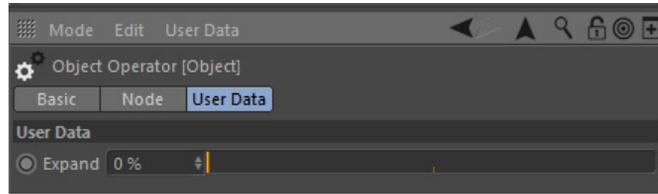


Figure 13-31 The **Expand** spinner in the Attribute Manager

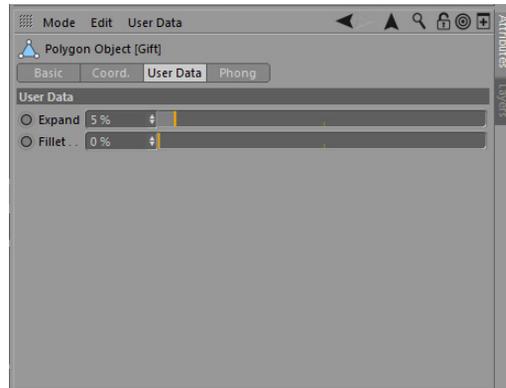


Figure 13-32 The **Fillet** spinner added to the Attribute Manager

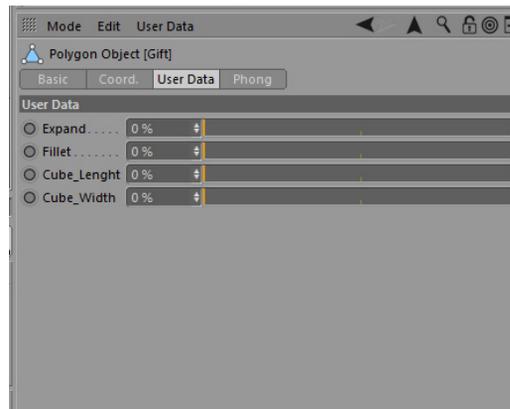


Figure 13-33 The **Cube_Length** and **Cube_Width** spinners added to the Attribute Manager

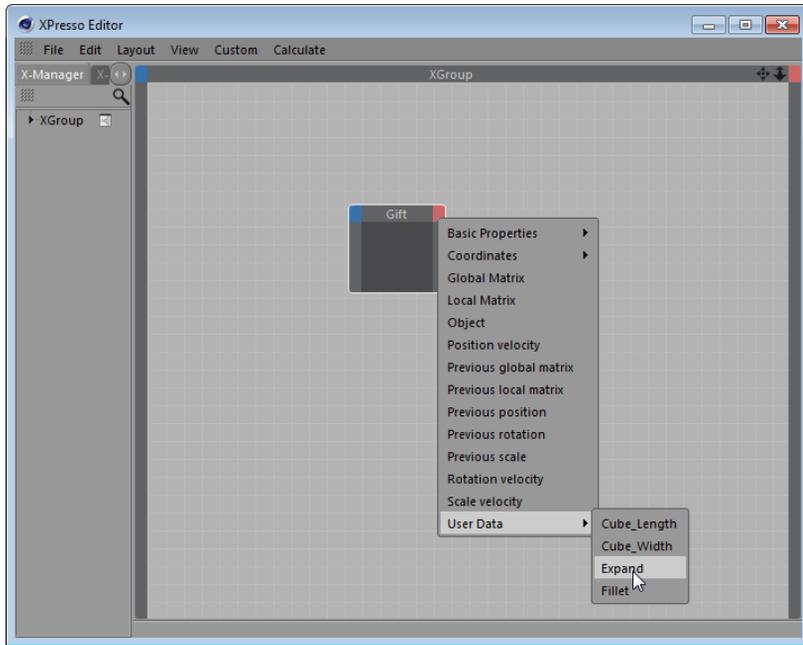


Figure 13-34 Choosing *Expand* from the flyout in the *XGroup* area

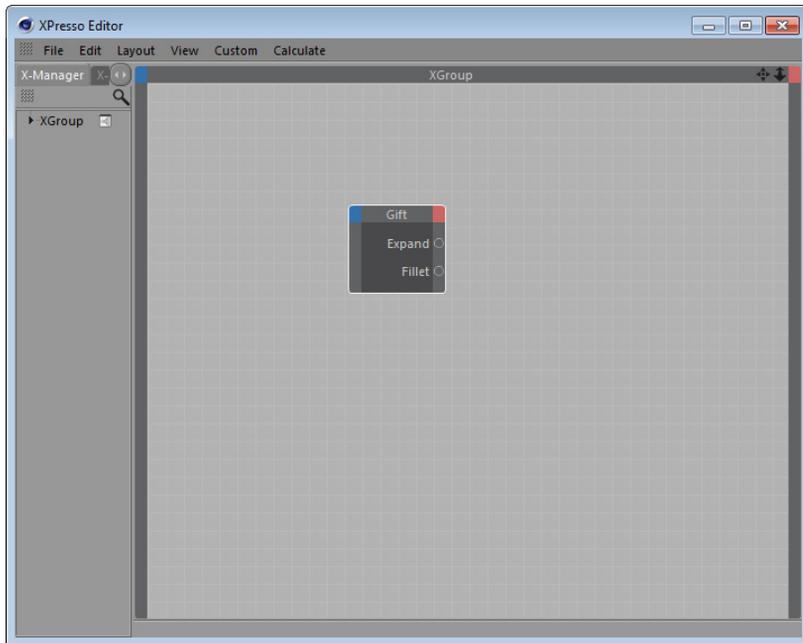


Figure 13-35 The *Fillet* output port added to the *Gift* node

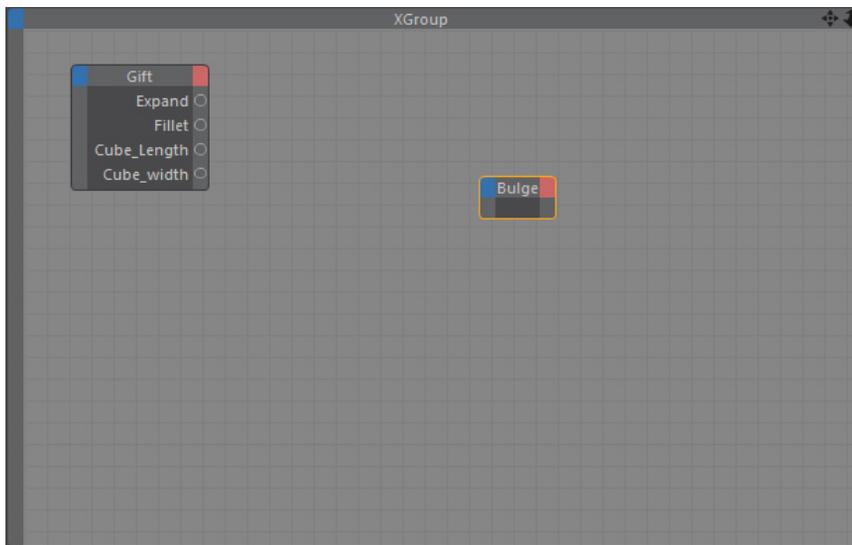


Figure 13-36 The **Bulge** node in the **XGroup** area

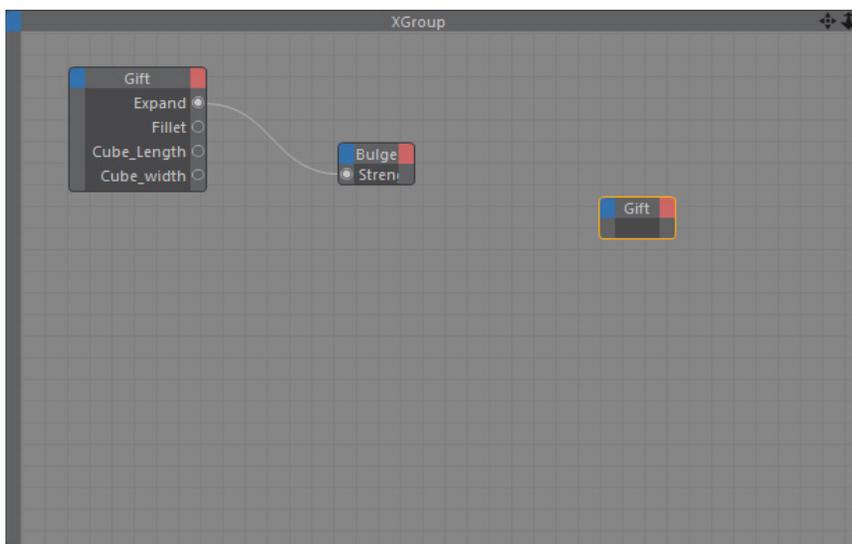


Figure 13-37 Connection established between the **Gift** and **Bulge** nodes

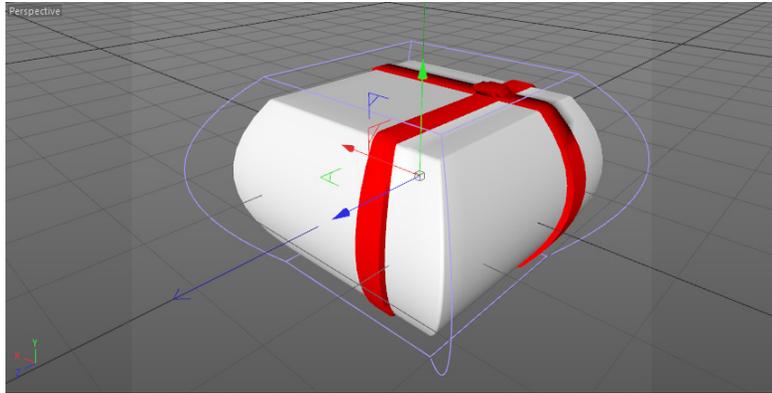


Figure 13-38 Gift expanded in the Perspective viewport

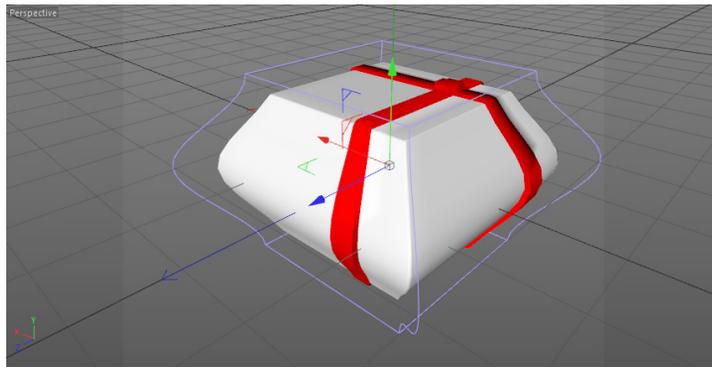


Figure 13-39 The deformation of the Gift softened in the Perspective viewport

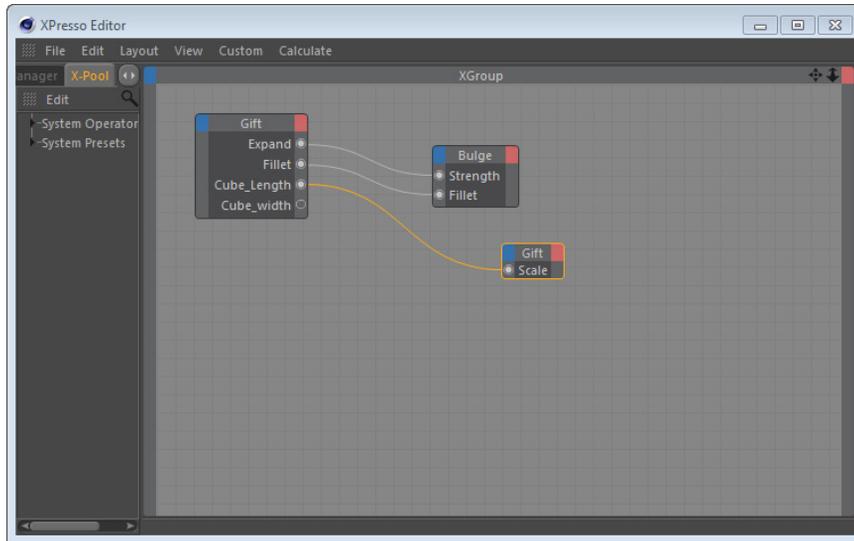


Figure 13-40 The two Gift nodes connected with each other

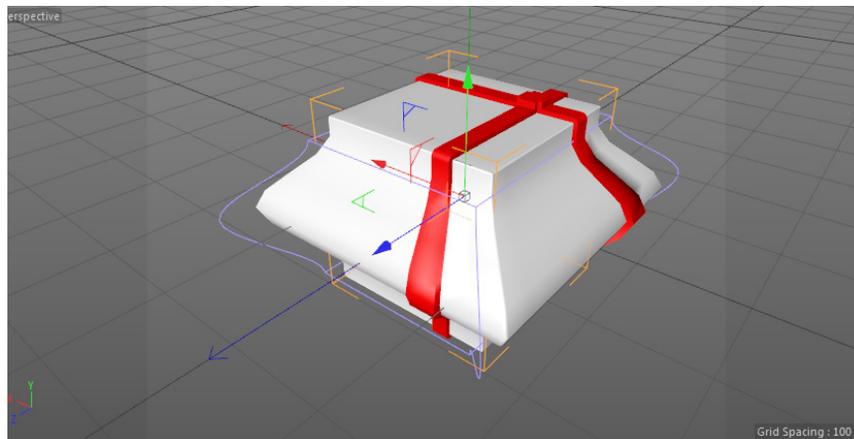


Figure 13-41 The Gift scaled in the Perspective viewport



Figure 13-42 The logo at frame 49