Chapter 1

Exploring CINEMA 4D R20 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*

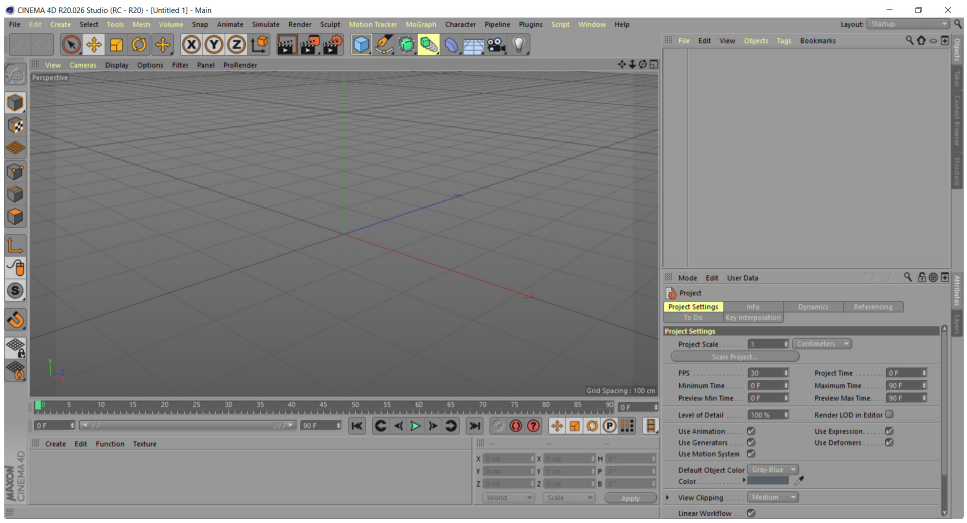

Figure 1-1 *The default interface of CINEMA 4D R20 Studio*

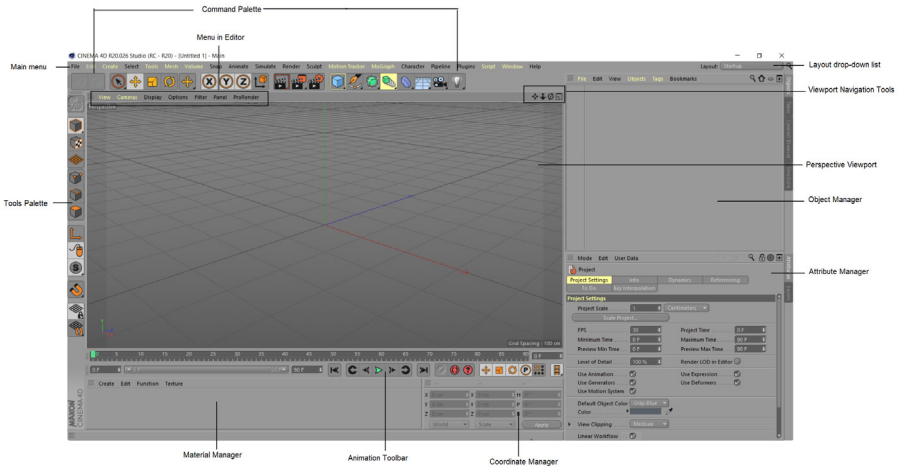

Figure 1-2 *Various components of CINEMA 4D R20 Studio interface*

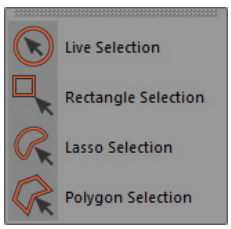

Figure 1-3 *The flyout displayed*

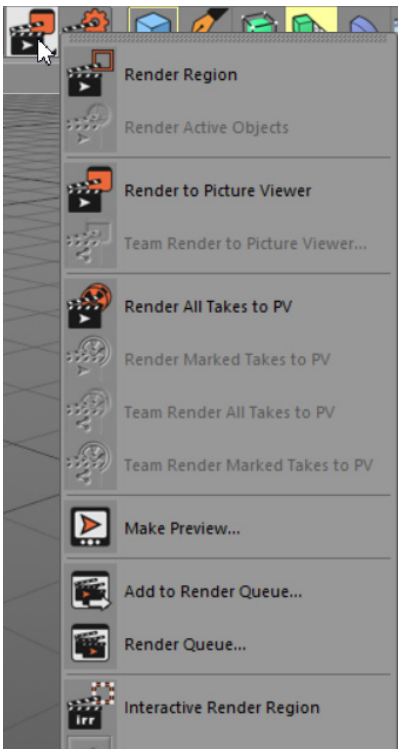

Figure 1-4 *The rendering options displayed in the flyout*

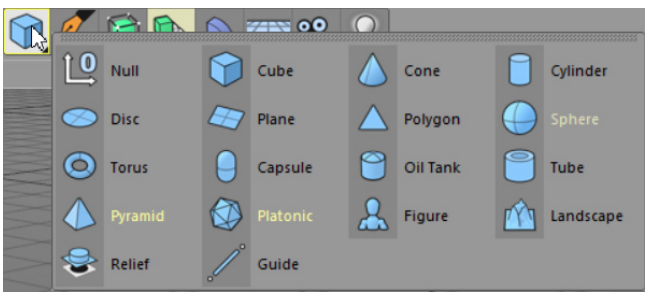

Figure 1-5 *The tools to create the parametric objects displayed in the flyout*

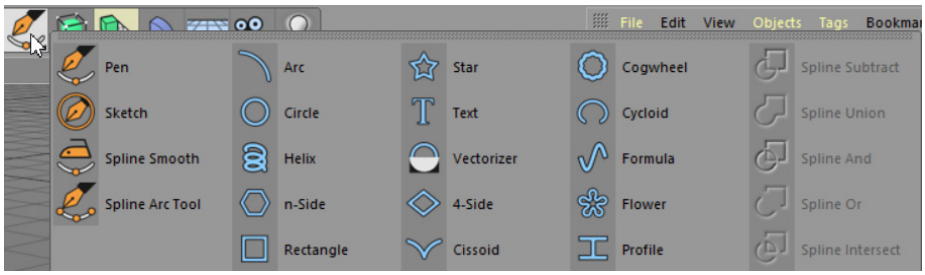

Figure 1-6 *The spline modeling tools displayed in the flyout*

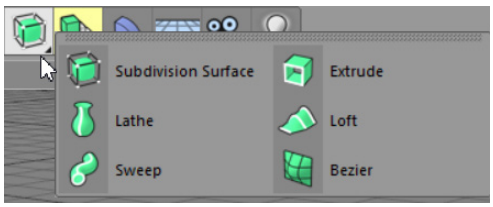

Figure 1-7 *The generators displayed in the flyout*

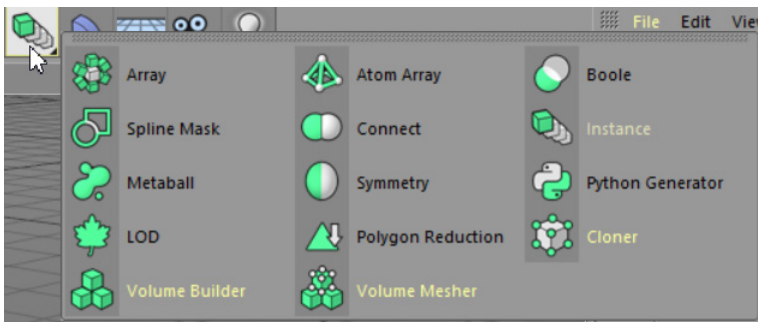

Figure 1-8 *The special modeling tools displayed in the flyout*

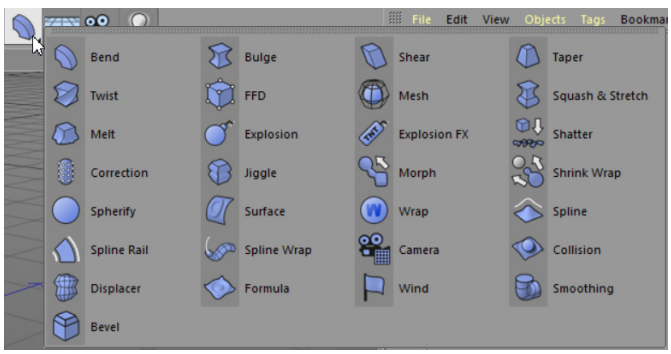

Figure 1-9 *Various deforming tools displayed in the flyout*

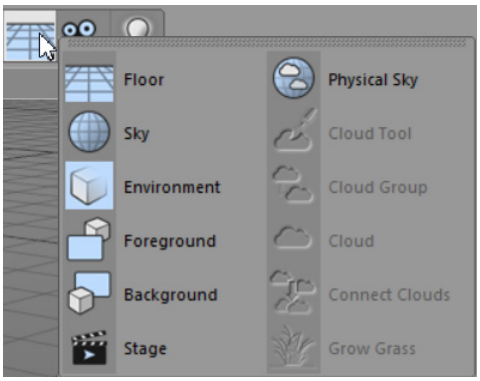

Figure 1-10 *Various tools displayed in the flyout*

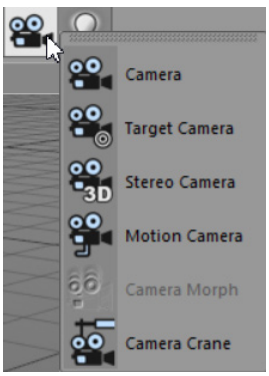

Figure 1-11 *Various camera tools displayed in the flyout*

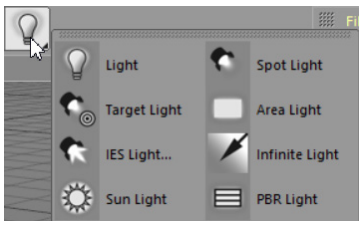

Figure 1-12 *Various light tools displayed in the flyout*

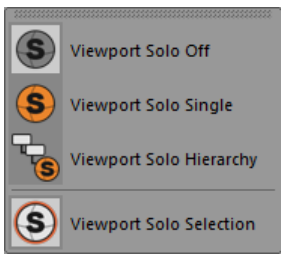

Figure 1-13 *Various options displayed in the flyout*

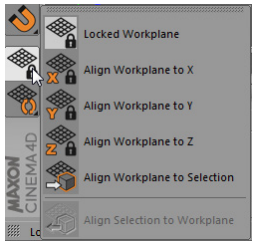

Figure 1-14 *Flyout displayed on choosing the* ***Locked Workplane*** *tool*

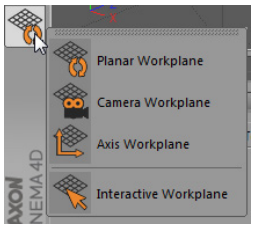

Figure 1-15 *Flyout displayed on choosing the* ***Planar Workplane*** *tool*

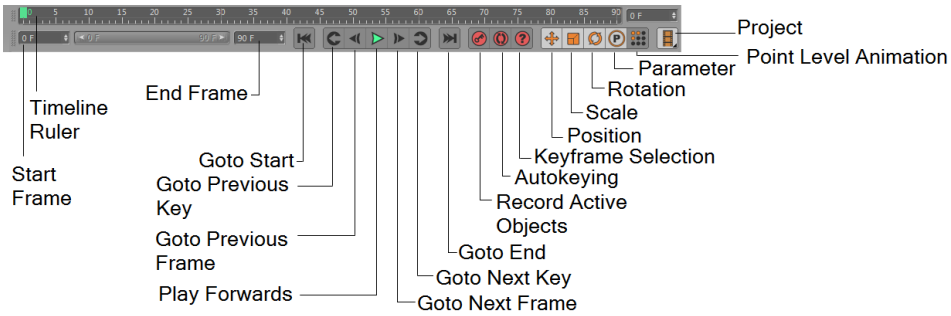

Figure 1-16 *The Animation toolbar*

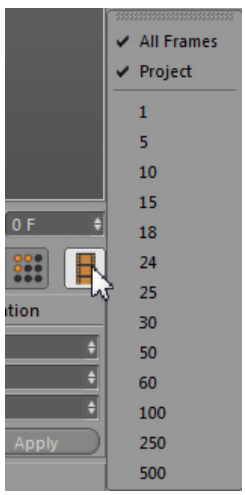

Figure 1-17 *The flyout displayed on choosing the* ***Project*** *button*

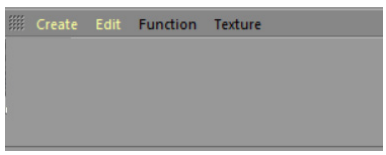

Figure 1-18 *The Material Manager*

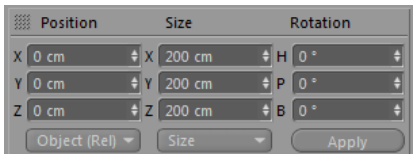

Figure 1-19 *The Coordinate Manager*

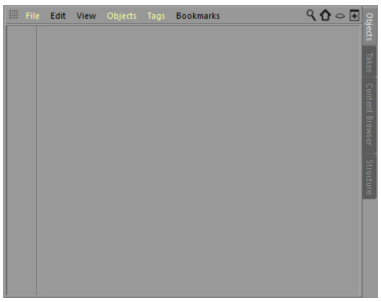

Figure 1-20 *The Object Manager*

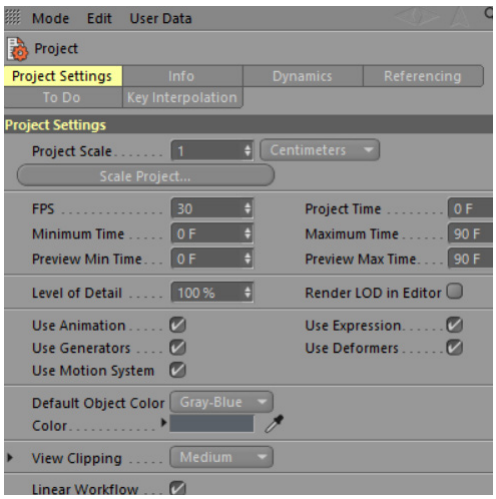

Figure 1-21 *The Attribute Manager*

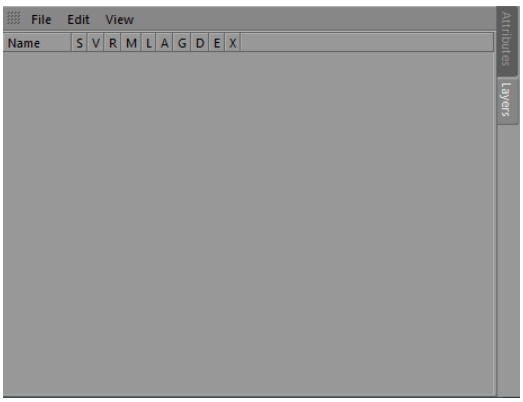

Figure 1-22 *The Layers Manager*

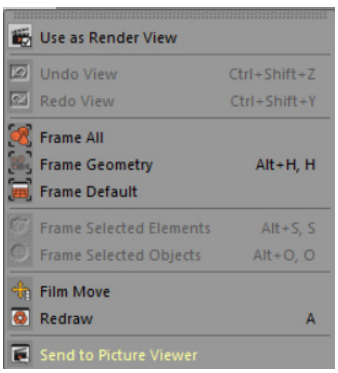

Figure 1-23 *The flyout displayed on choosing the* ***View*** *menu*

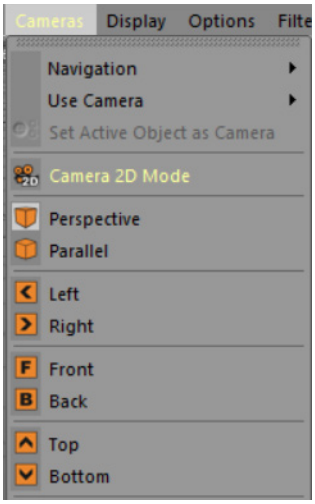

Figure 1-24 *The flyout displayed on choosing the* ***Cameras*** *menu*

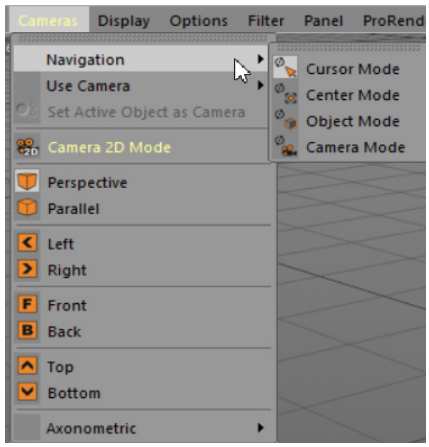

Figure 1-25 *The cascading menu displayed on choosing the* ***Navigation*** *option from the* ***Cameras*** *menu*

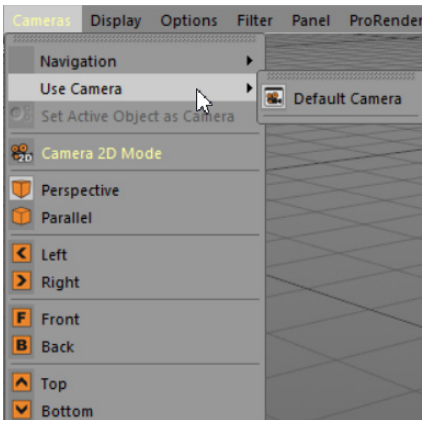

Figure 1-26 *The cascading menu displayed on choosing the* ***Use Camera*** *option*

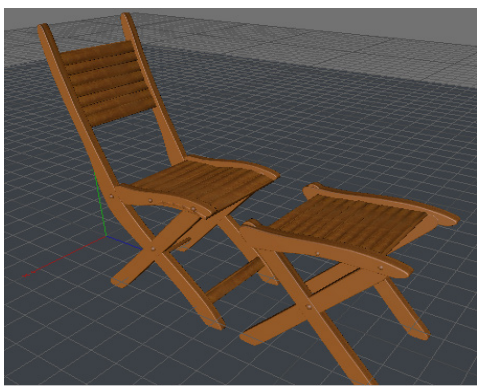

Figure 1-27 *The perspective camera projection mode*



Figure 1-28 *The parallel camera projection mode*

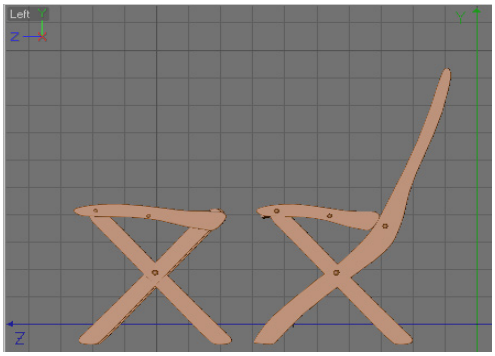

Figure 1-29 *The left camera projection*

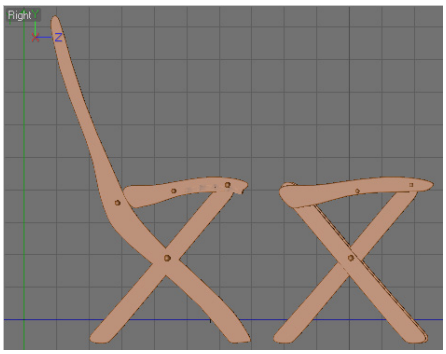

Figure 1-30 *The right camera projection*

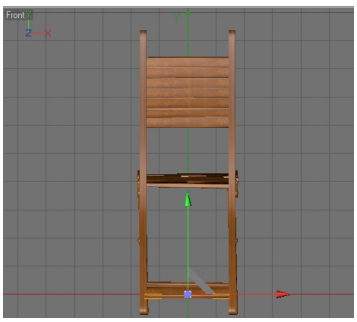

Figure 1-31 *The front camera projection*

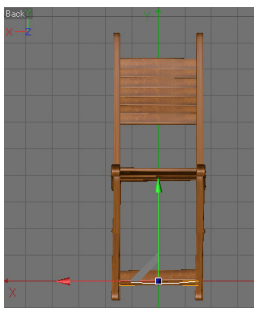

Figure 1-32 *The back camera projection*



Figure 1-33 *The top camera projection*

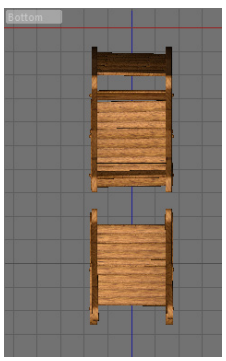

Figure 1-34 *The bottom camera projection*

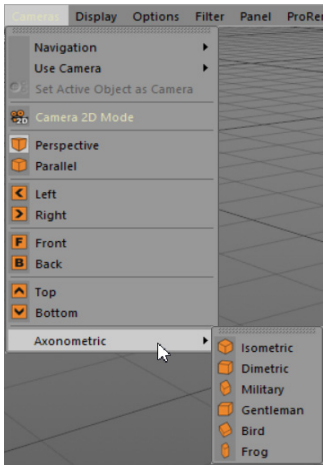

Figure 1-35 *The cascading menu displayed on choosing the* ***Axonometric*** *option from the* ***Cameras*** *menu*

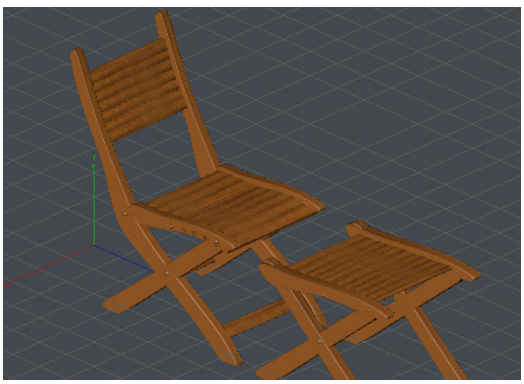

Figure 1-36 *The isometric camera projection*



Figure 1-37 *The dimetric camera projection*

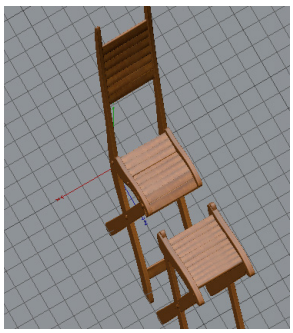

Figure 1-38 *The military camera projection*

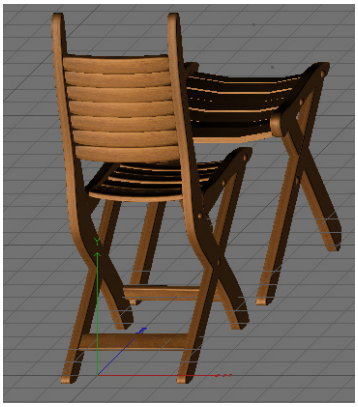

Figure 1-39 *The gentleman camera projection*

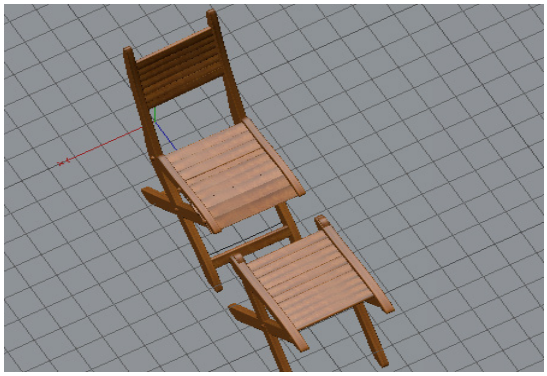

Figure 1-40 *The bird camera projection*

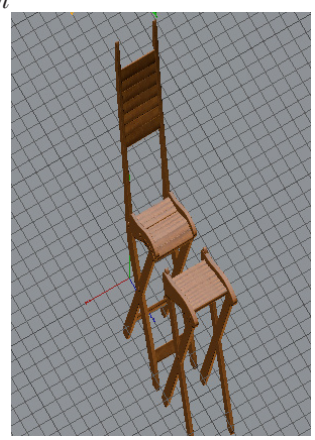

Figure 1-41 *The frog camera projection*

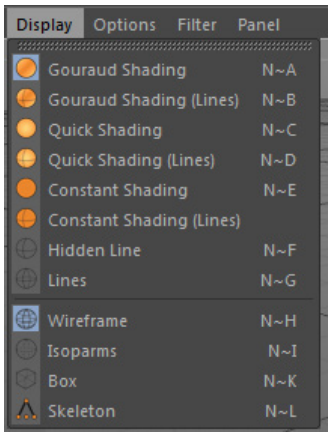

Figure 1-42 *The flyout displayed on choosing the* ***Display*** *menu*

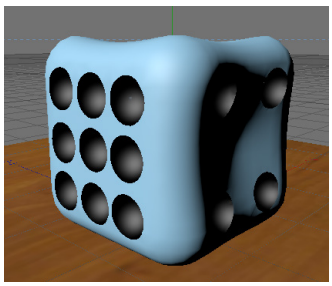

Figure 1-43 *The object displayed in the viewport on choosing the* ***Gouraud Shading*** *option*

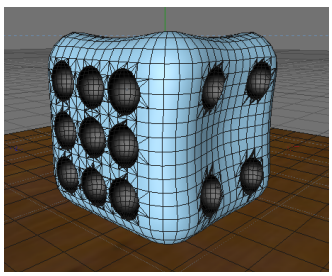

Figure 1-44 *The object displayed in the viewport on choosing the* ***Gouraud Shading (Lines)*** *option*

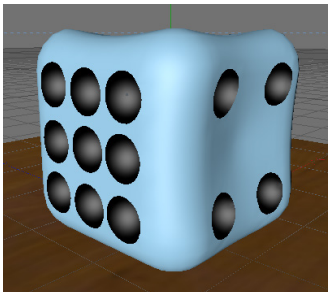

Figure 1-45 *The object displayed in the viewport on choosing the* ***Quick Shading*** *option*

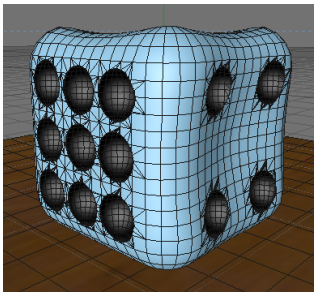

Figure 1-46 *The object displayed in the viewport on choosing the* ***Quick Shading (Lines)*** *option*

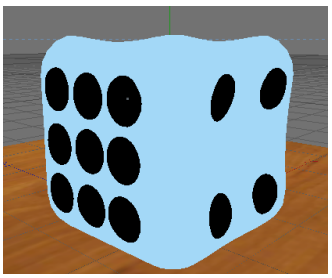

Figure 1-47 *The object displayed in the viewport on choosing the* ***Constant Shading*** *option*

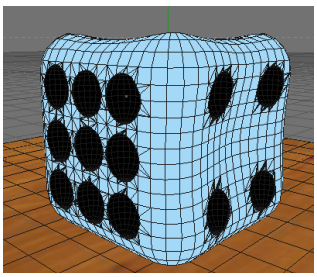

Figure 1-48 *The object displayed in the viewport on choosing the* ***Constant Shading (Lines)*** *option*

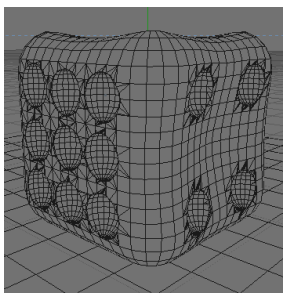

Figure 1-49 *The object displayed in the viewport on choosing the* ***Hidden Line*** *option*

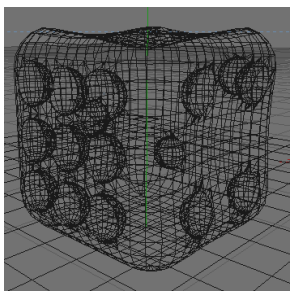

Figure 1-50 *The object displayed in the viewport on choosing the* ***Lines*** *option*

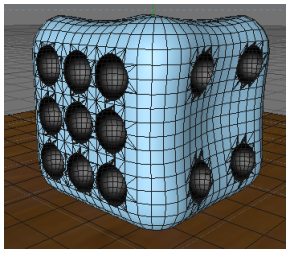

Figure 1-51 *The object displayed in the* ***Wireframe*** *and* ***Quick Shading (Lines)*** *shading modes*

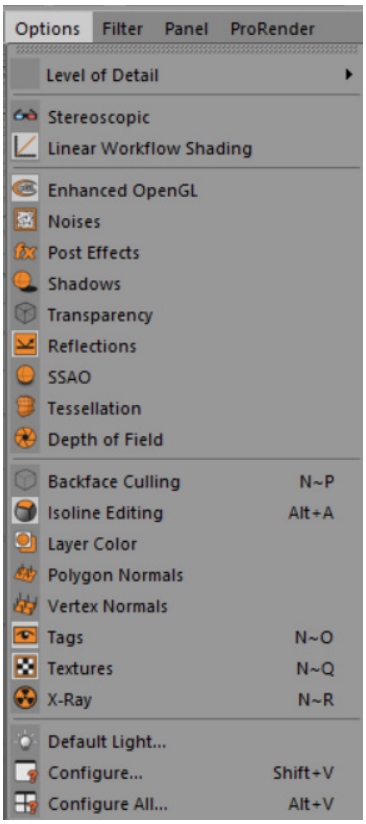

Figure 1-52 *The partial view of the flyout displayed on choosing the* ***Options*** *menu*

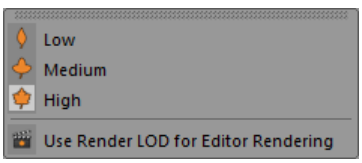

Figure 1-53 *The cascading menu displayed on placing the cursor on the* ***Level of Detail*** *option*

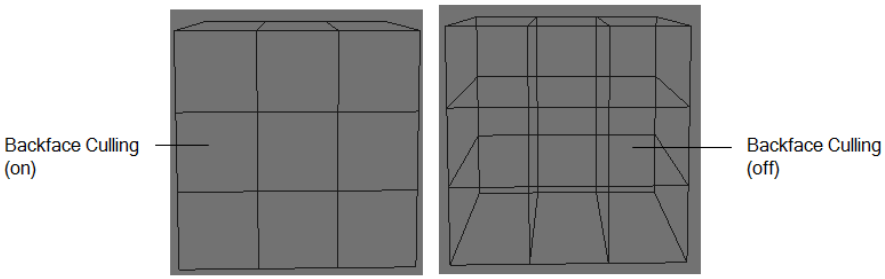

Figure 1-54 *The object displayed with the* ***Backface Culling*** *option on and off*

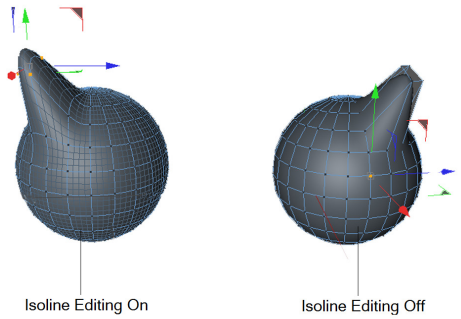

Figure 1-55 *The object displayed with the* ***Isoline Editing*** *option on and off*

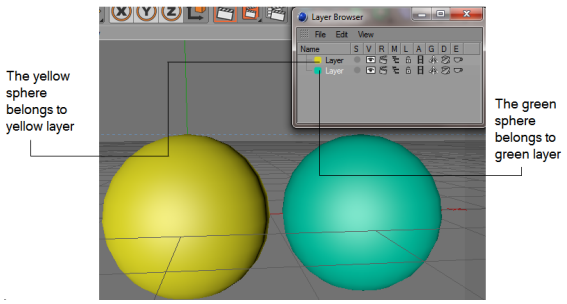

Figure 1-56 *The color of the objects displayed same as the color of layers on choosing the* ***Layer Color*** *option*

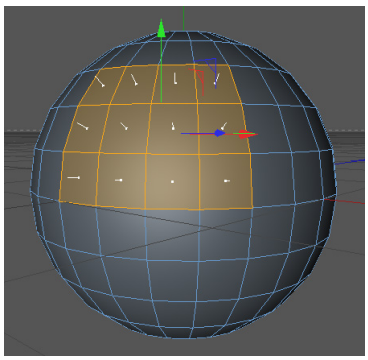

Figure 1-57 *Displaying the normals of the selected polygons*

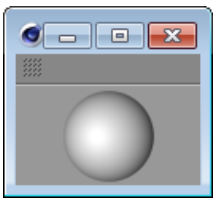

Figure 1-58 *The* ***Default Light*** *window*

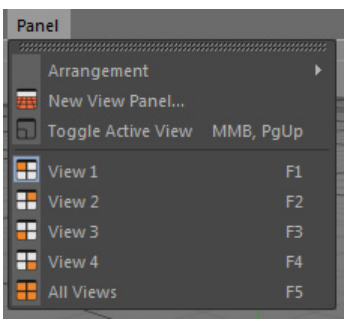

Figure 1-59 *The flyout displayed on choosing the* ***Panel*** *menu*

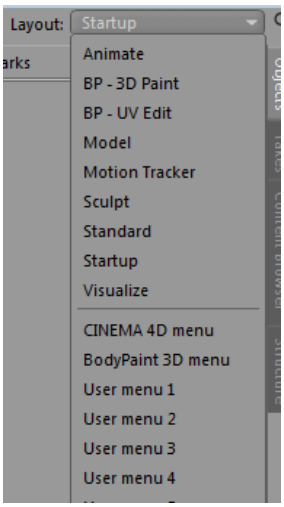

Figure 1-60 *The* ***Layout*** *drop-down list*

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*

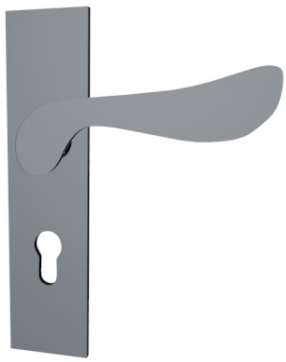

Figure 2-1 *The model of door lock system*

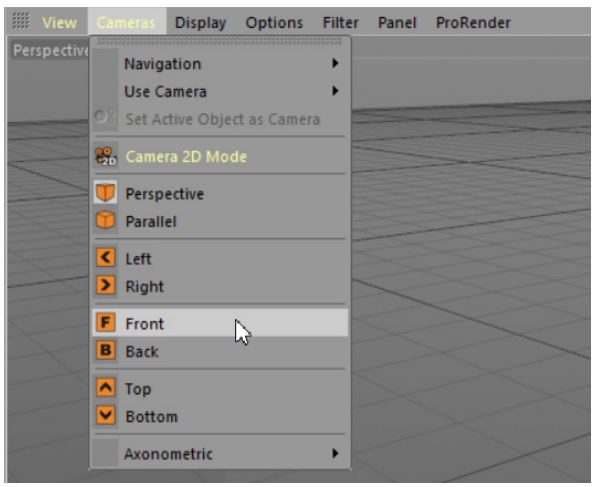

Figure 2-2 *Choosing the* ***Front*** *option from the Menu in editor view*

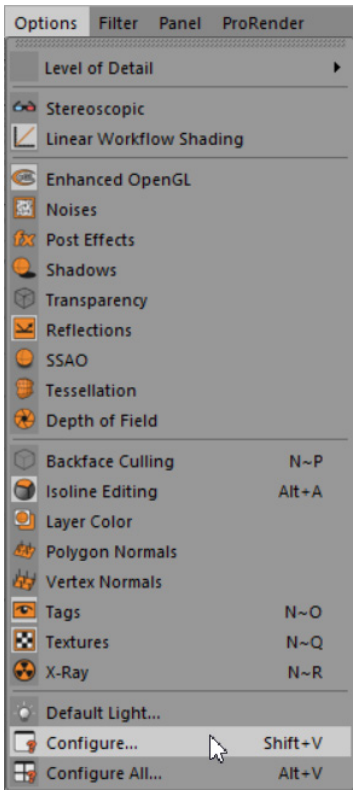

Figure 2-3 *Choosing the* ***Configure*** *option from the Menu in editor view*

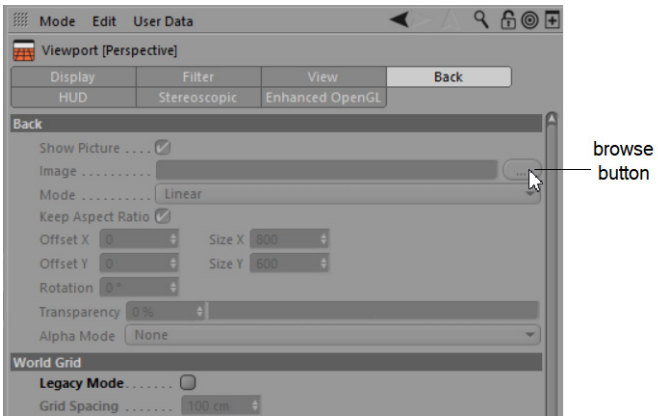

Figure 2-4 *Choosing the browse button next to the* ***Image*** *text box*

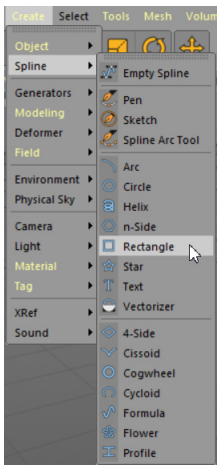

Figure 2-5 *Choosing* ***Rectangle*** *from the* ***Create*** *menu*

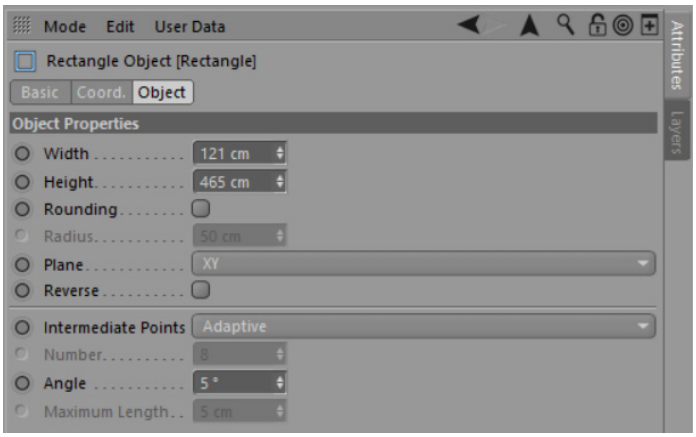

Figure 2-6 *Setting the width and height of the rectangle*

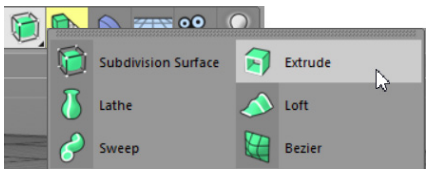

Figure 2-7 *Choosing* ***Extrude*** *from the flyout*

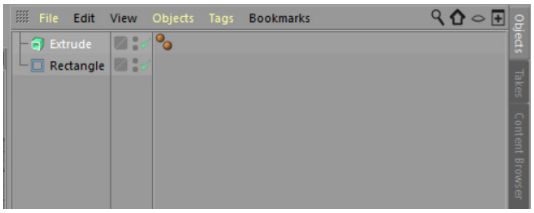

Figure 2-8 *Extrude added to the Object Manager*

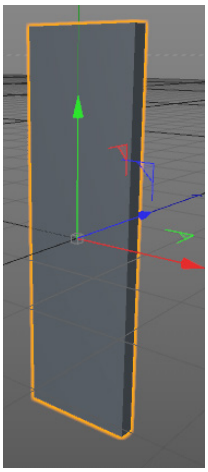

Figure 2-9 *Rectangle extruded in the Perspective viewport*

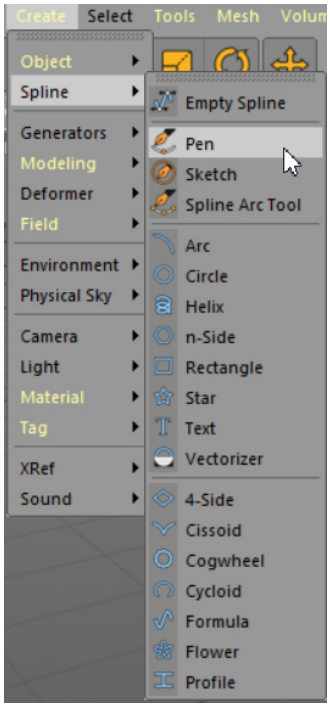

Figure 2-10 *Choosing* ***Pen*** *from the main menu*

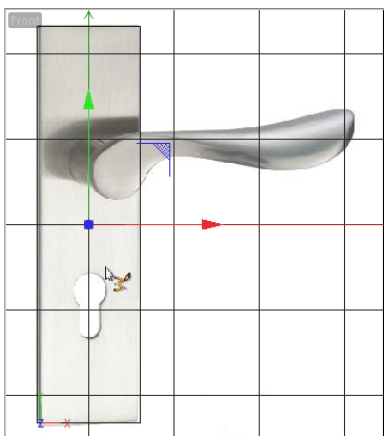

Figure 2-11 *The changed shape of the cursor*

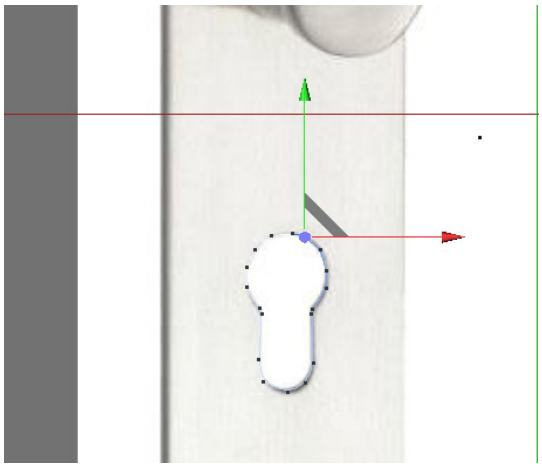

Figure 2-12 *Shape of the keyhole*

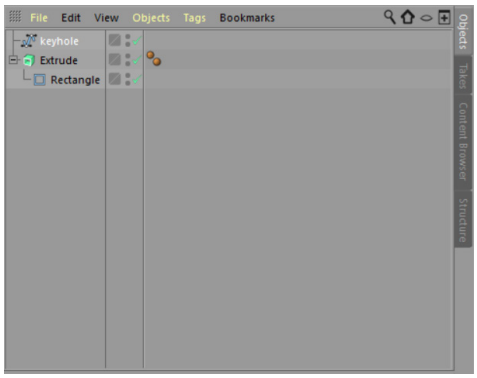

Figure 2-13 *Spline renamed as keyhole*

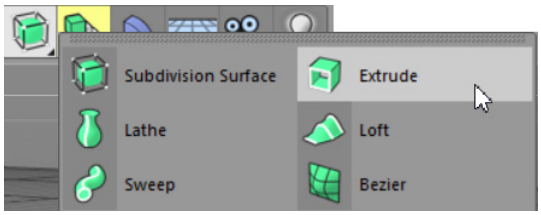

Figure 2-14 *Choosing* ***Extrude*** *from the flyout*

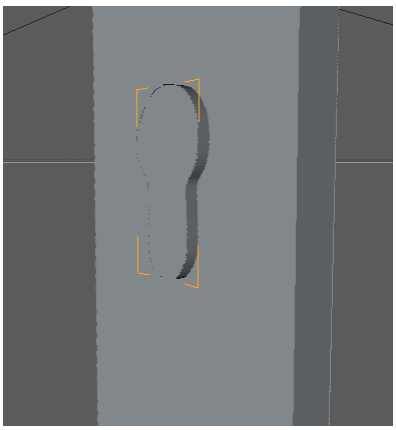

Figure 2-15 *keyhole extruded in the Perspective viewport*

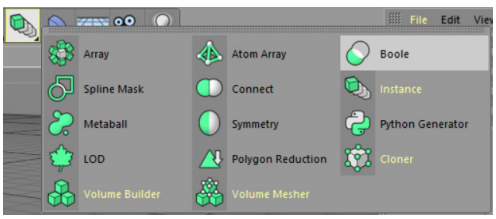

Figure 2-16 *Choosing* ***Boole*** *from the flyout*

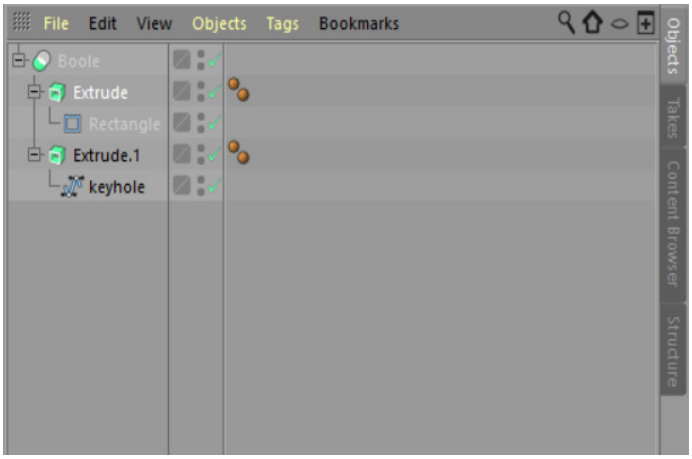

Figure 2-17 *Extrude connected to Boole*

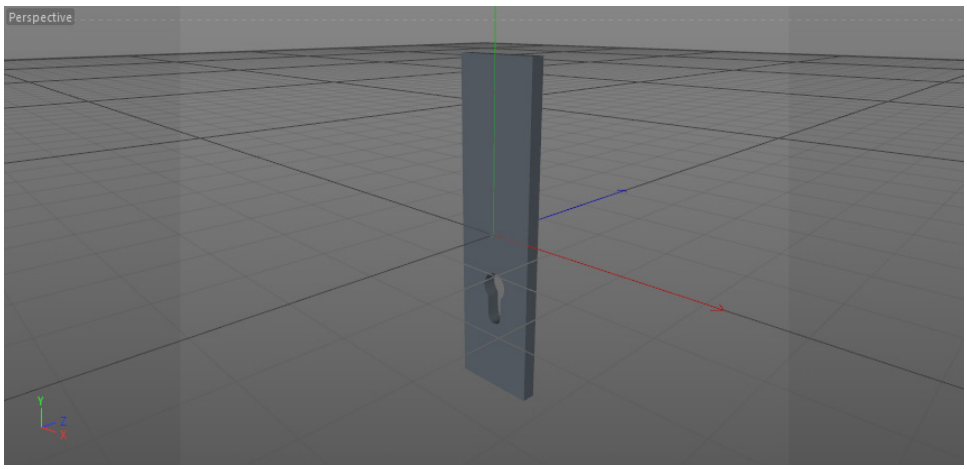

Figure 2-18 *The hole created in the Perspective viewport*

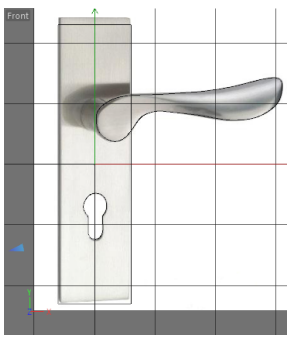

Figure 2-19 *Handle placed in the front viewport*

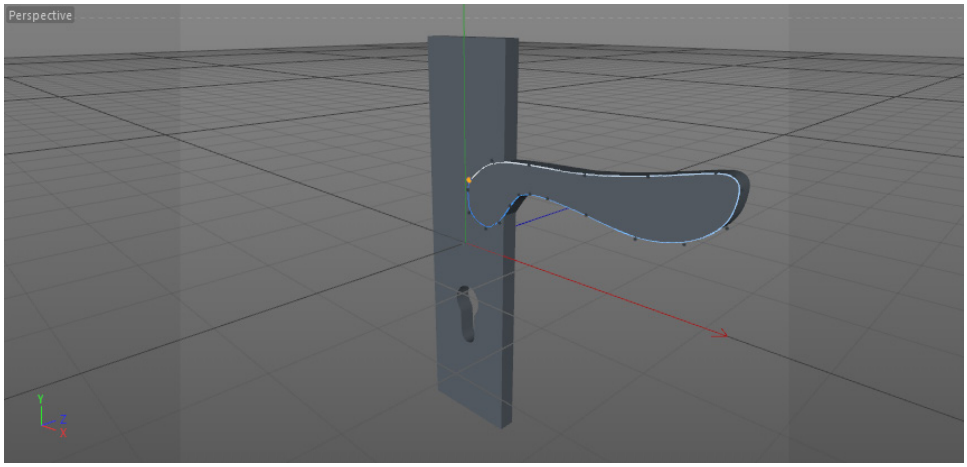

Figure 2-20 *Handle extruded in the Perspective viewport*

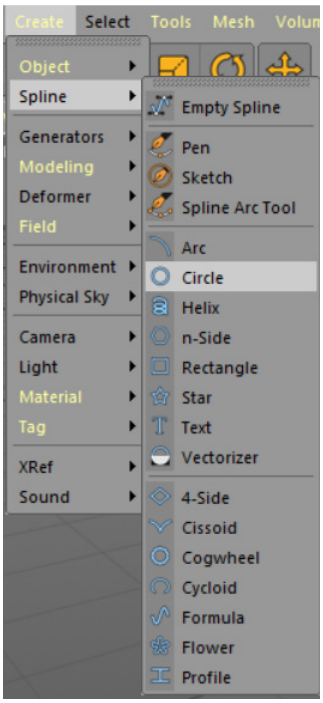

Figure 2-21 *Choosing* ***Circle*** *from the main menu*

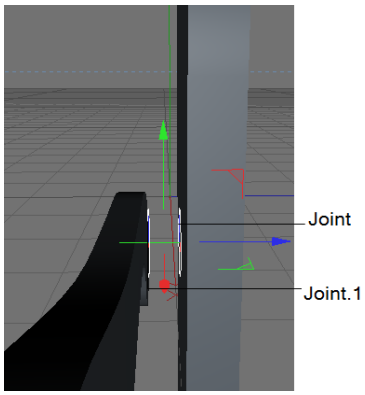

Figure 2-22 *The position of Joint and Joint.1 displayed in the Perspective viewport*

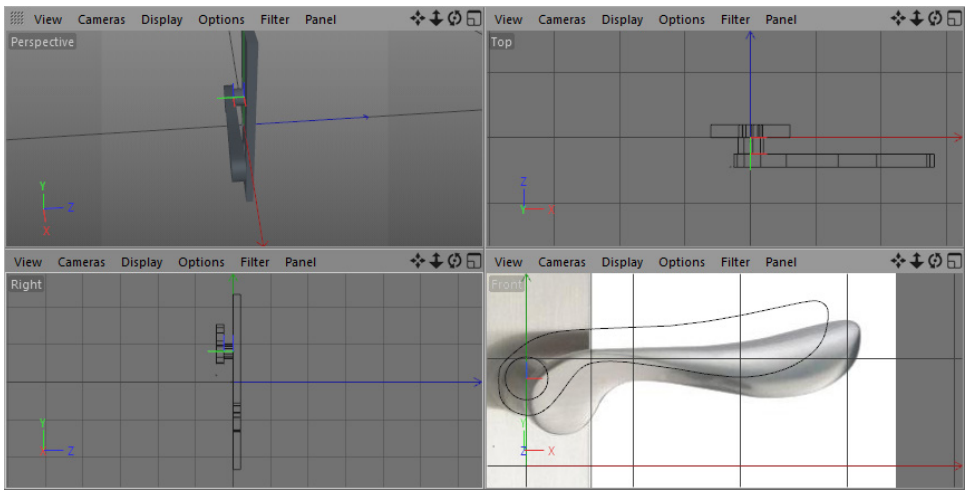

Figure 2-23 *Joint and Joint.1 lofted to create a surface*

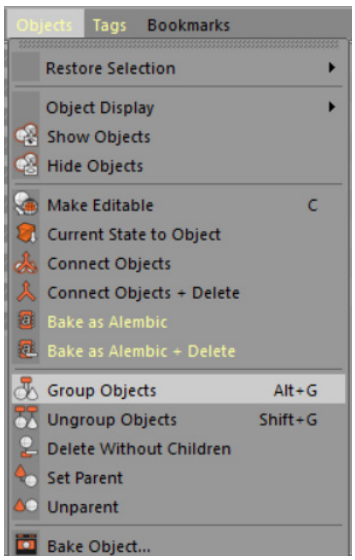

Figure 2-24 *Choosing* ***Group Objects*** *from the* ***Objects*** *menu*

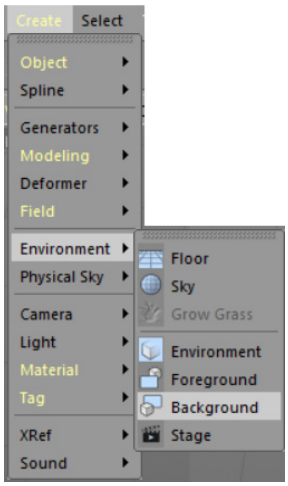

Figure 2-25 *Choosing the* ***Background*** *option from the main menu*

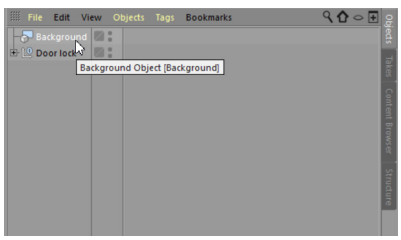

Figure 2-26 *The* ***Background*** *Object selected in the Object Manager*

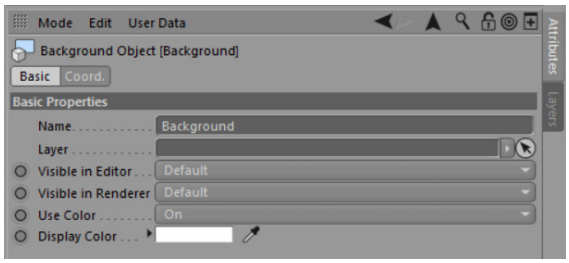

Figure 2-27 *The* ***Display Color*** *parameter activated*

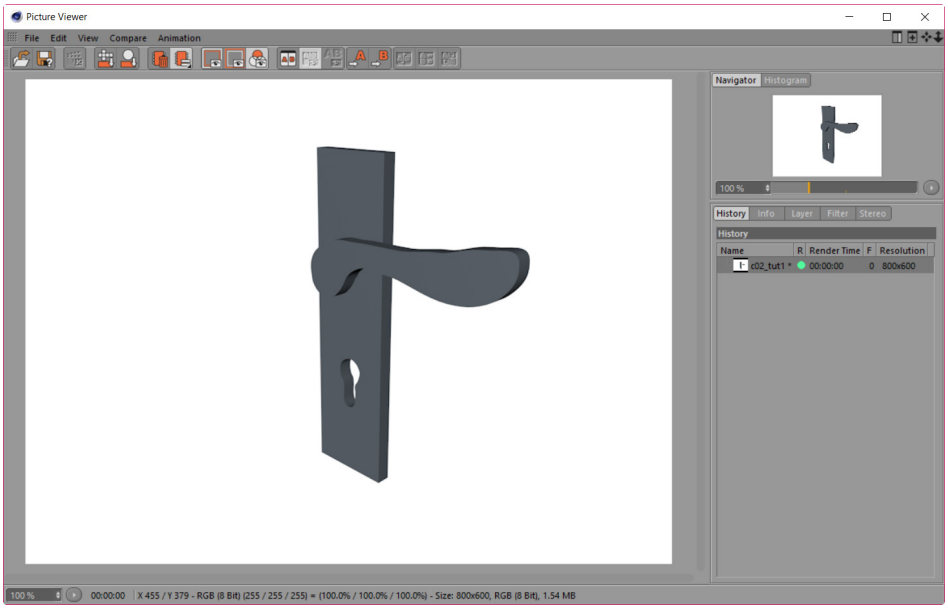

Figure 2-28 *The* ***Picture Viewer*** *window*

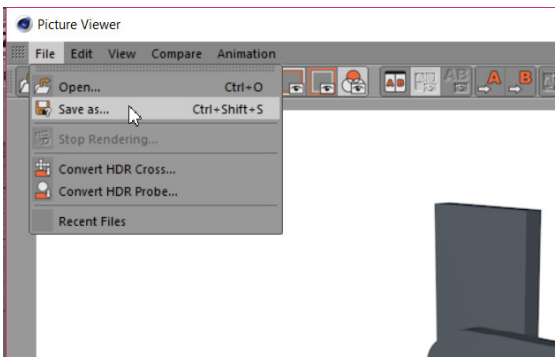

Figure 2-29 *Choosing the* ***Save as*** *option from the* ***File*** *menu*

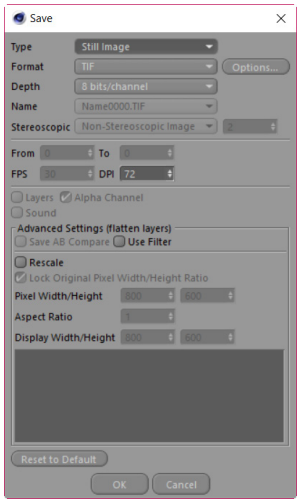

Figure 2-30 *The* ***Save*** *dialog box*

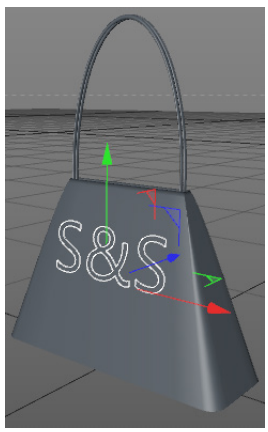

Figure 2-31 *The model of a hand bag*

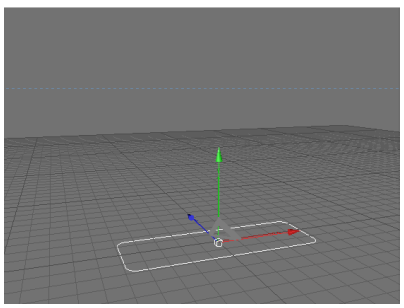

Figure 2-32 *Rectangle placed in the Perspective viewport*

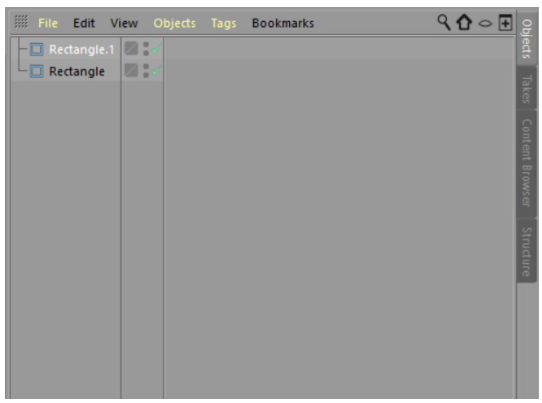

Figure 2-33 *Rectangle.1 added to the Object Manager*

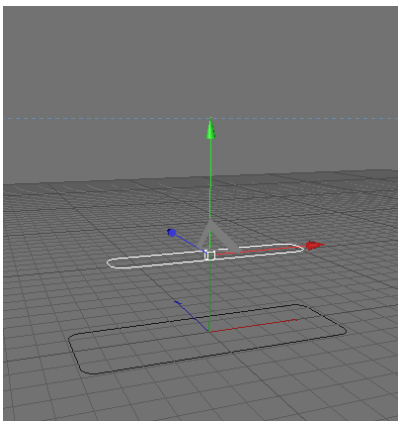

Figure 2-34 *Rectangle.1 placed in the Perspective viewport*

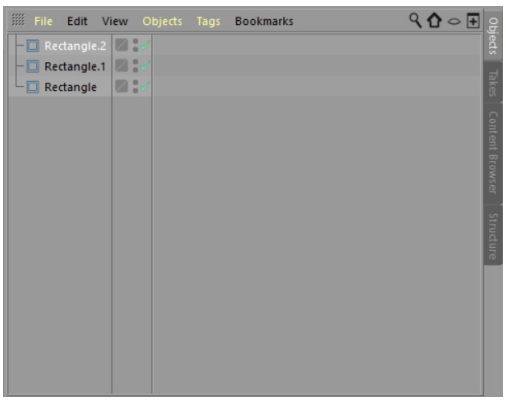

Figure 2-35 *Rectangle.2 added to the Object Manager*

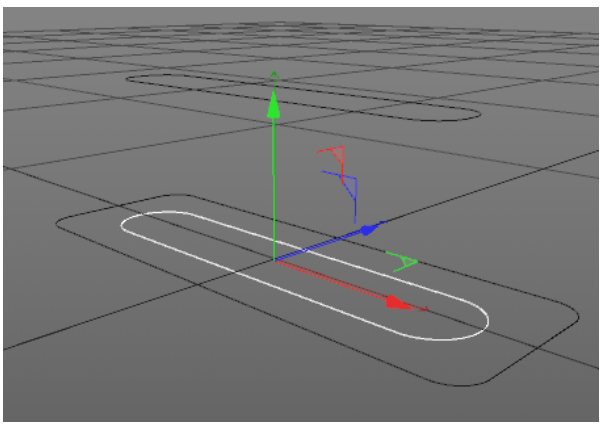

Figure 2-36 *Rectangle.2 placed in the Perspective viewport*

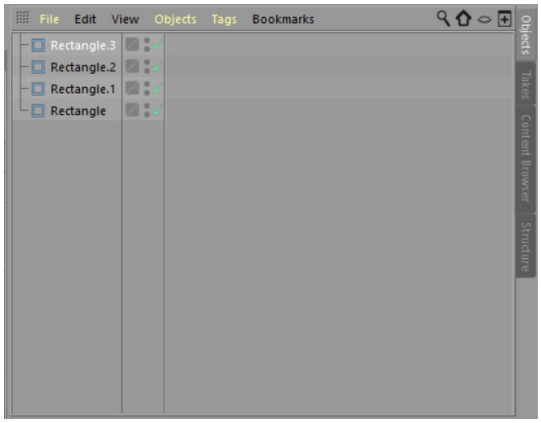

Figure 2-37 *Rectangle.3 added to the Object Manager*

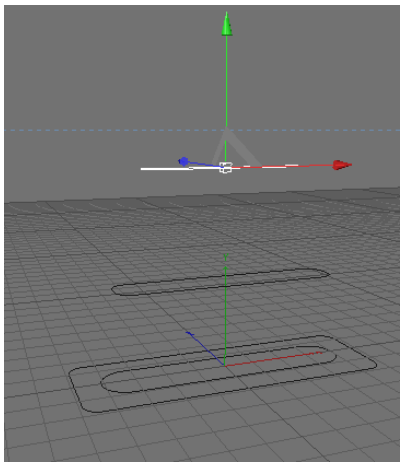

Figure 2-38 *Rectangle.3 placed in the Perspective viewport*

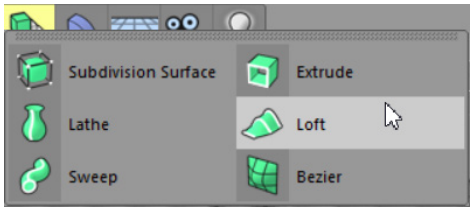

Figure 2-39 *Choosing* ***Loft*** *from the flyout*

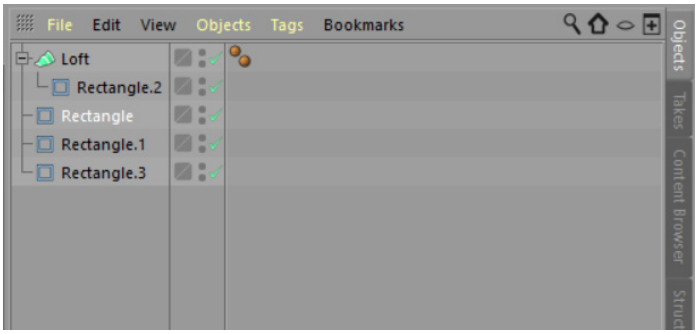

Figure 2-40 *Rectangle.2 connected to Loft in the Object Manager*

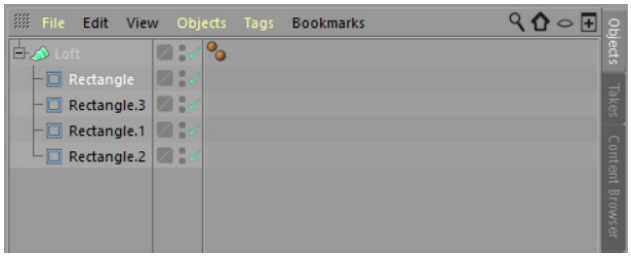

Figure 2-41 *Rectangle, Rectangle.1, and Rectangle.3 connected to Loft*

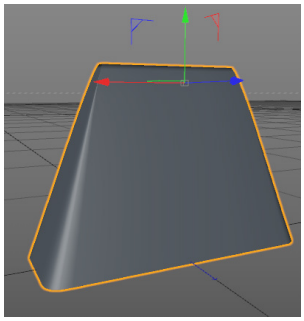

Figure 2-42 *All rectangles lofted in the Perspective viewport*

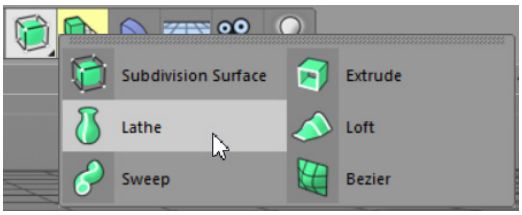

Figure 2-43 *Choosing* ***Lathe*** *from the flyout*

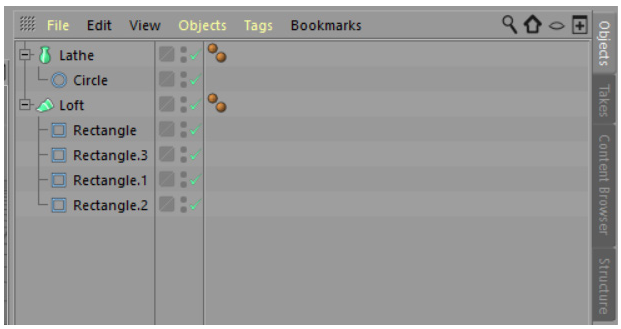

Figure 2-44 *Circle connected to Lathe in the Object Manager*

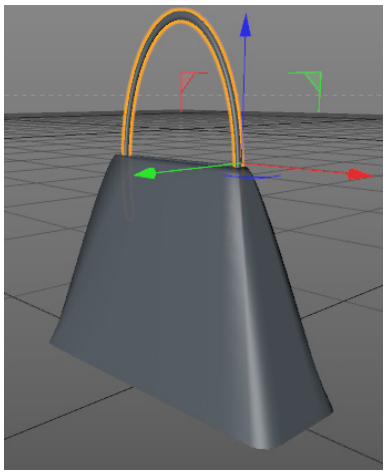

Figure 2-45 *The handle of the hand bag created*

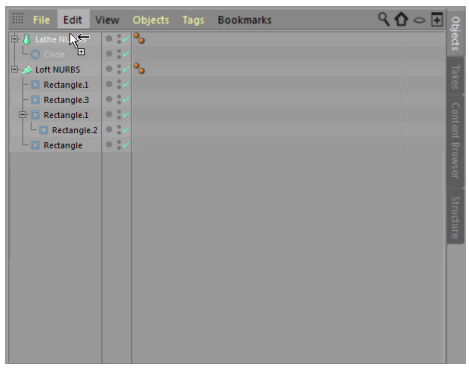

Figure 2-46 *The changed shape of the cursor in the Object Manager*

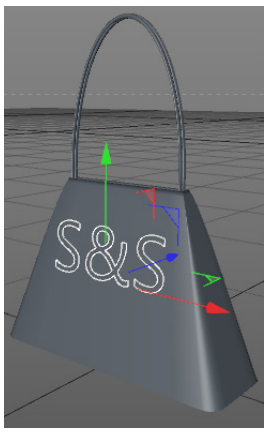

Figure 2-47 *The text placed in the Perspective viewport*

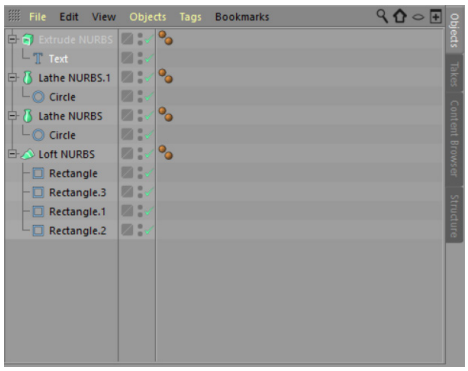

Figure 2-48 *Text connected to Extrude in the Object Manager*



Figure 2-49 *The extruded text on the hand bag*



Figure 2-50 *The model of the cigar pipe*

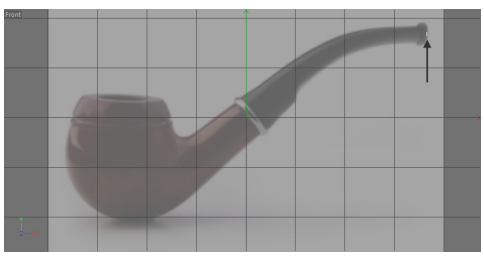

Figure 2-51 *Ellipse displayed in the Front viewport*

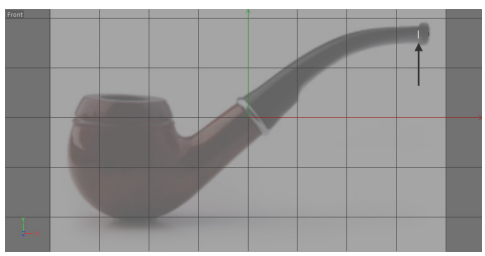

Figure 2-52 *Ellipse.1 displayed in the Front viewport*

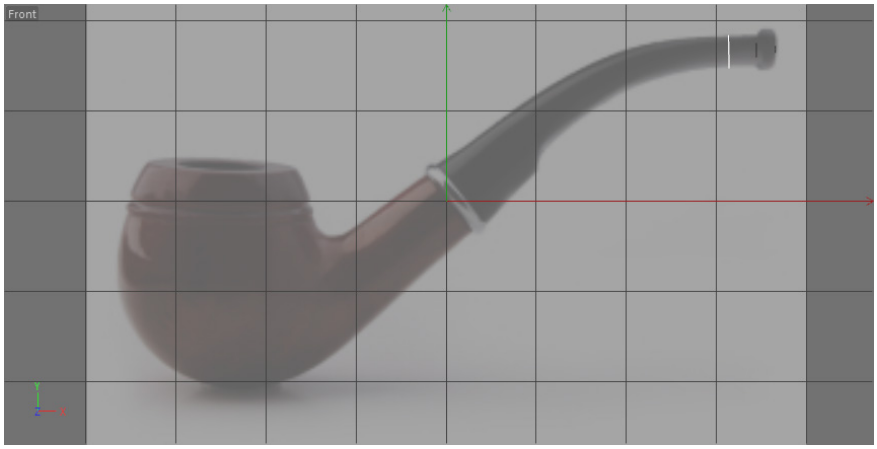

Figure 2-53 *Circle displayed in the Front viewport*

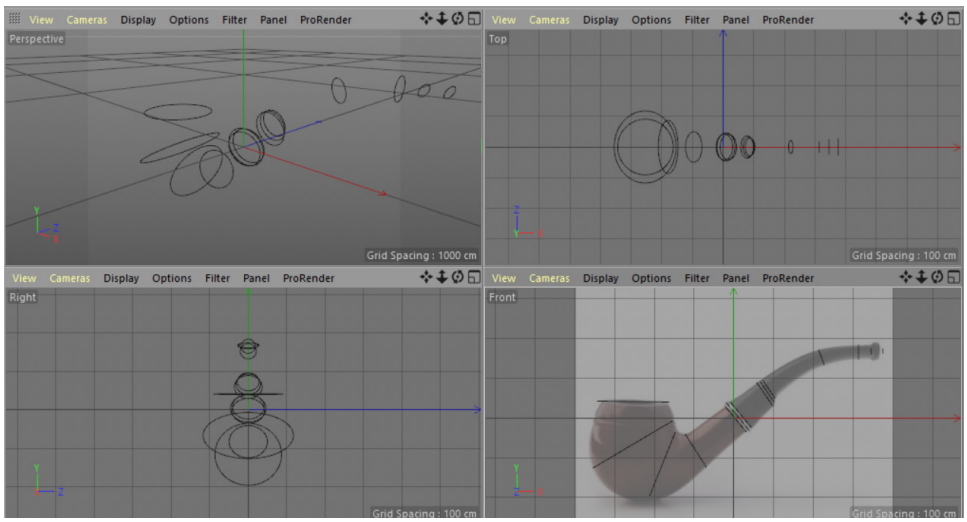

Figure 2-54 *The profile of the pipe displayed*

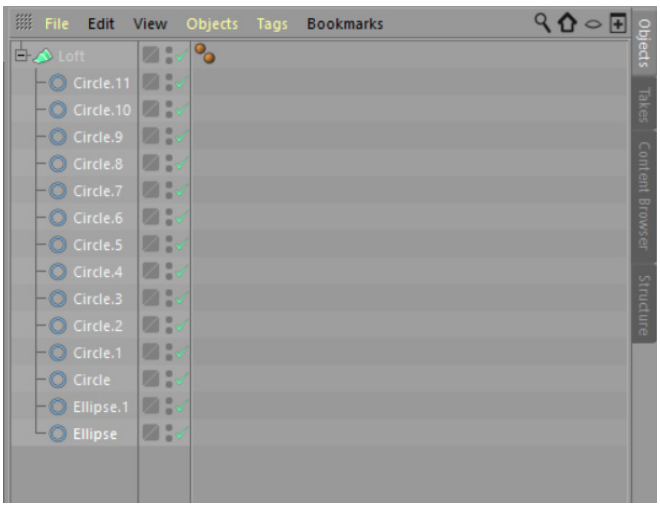

Figure 2-55 *The splines connected with Loft*

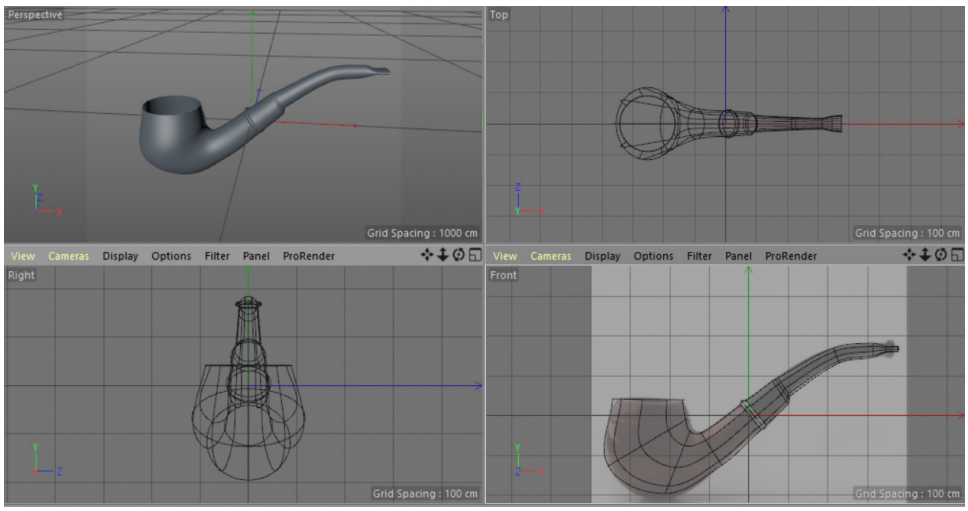

Figure 2-56 *The shape of the pipe displayed*

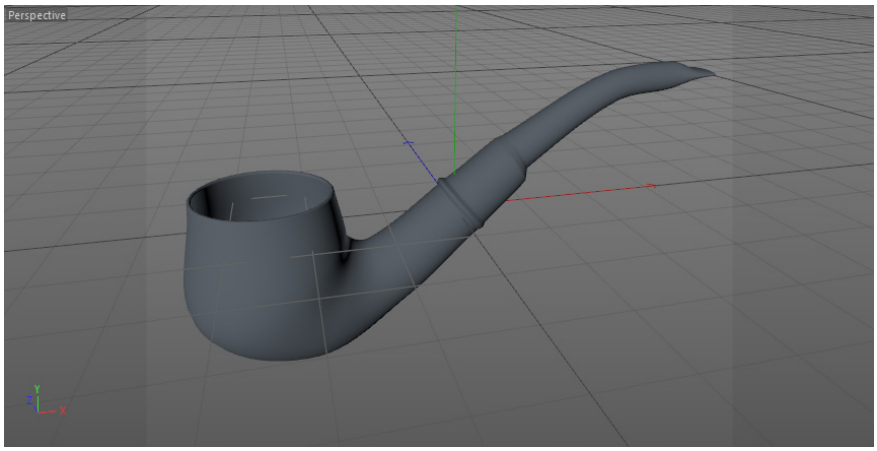

Figure 2-57 *The pipe with the fillet caps displayed*



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*

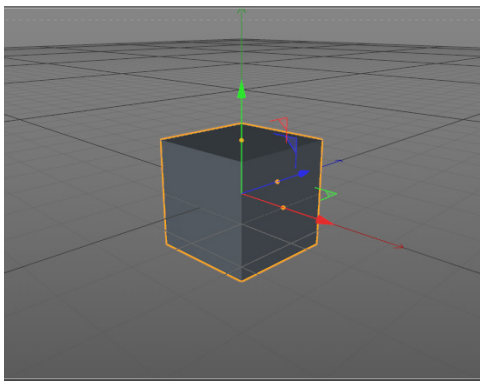

Figure 3-2 *Cube created in the Perspective viewport*

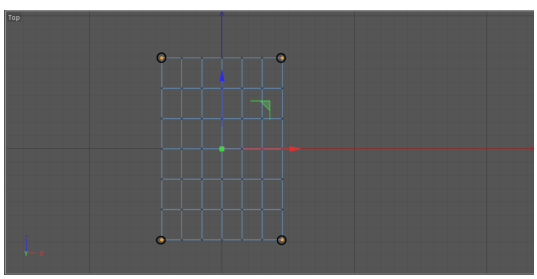

Figure 3-3 *The corner points of Computer mouse to be selected*

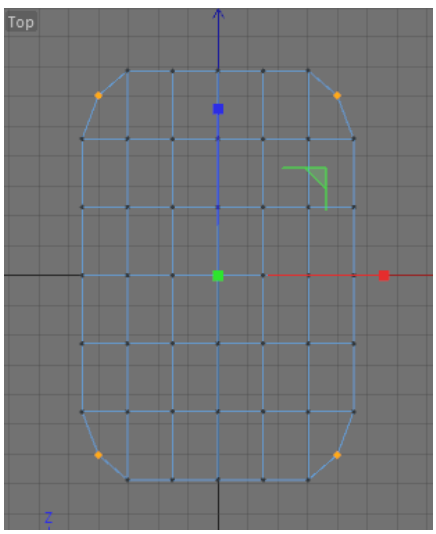

Figure 3-4 *Scaling the selected points of Computer mouse*

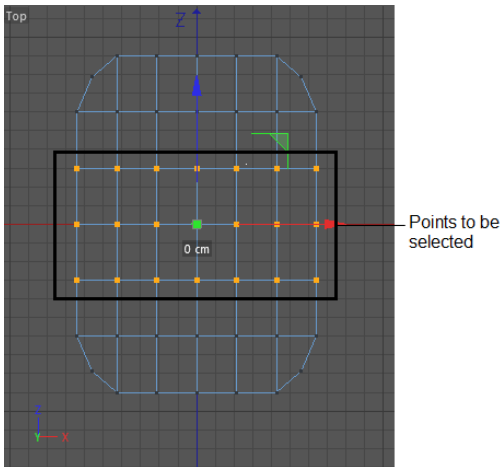

Figure 3-5 *The points to be selected*

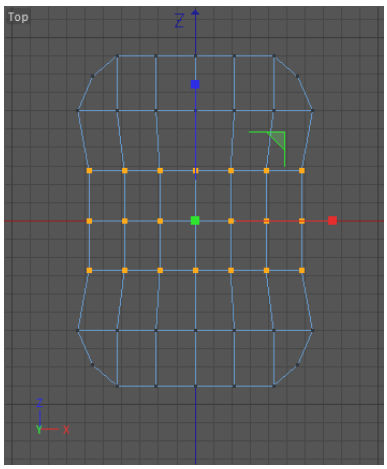

Figure 3-6 *Scaling the selected points of Computer mouse*

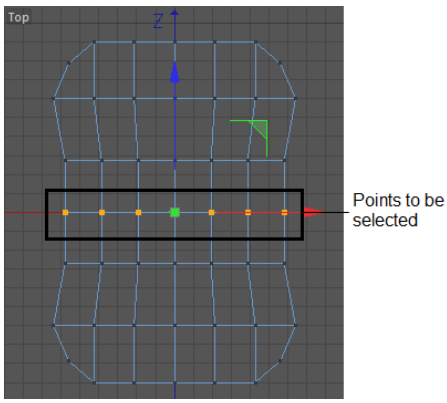

Figure 3-7 *The center points to be selected*

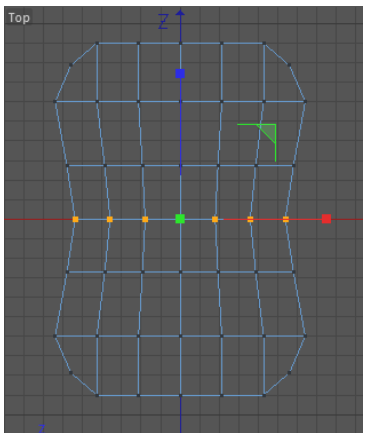

Figure 3-8 *Scaling the selected points of Computer mouse*

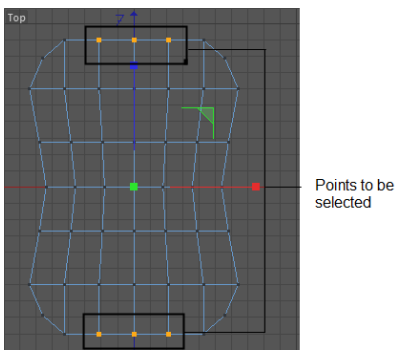

Figure 3-9 *The selected points of Computer mouse*

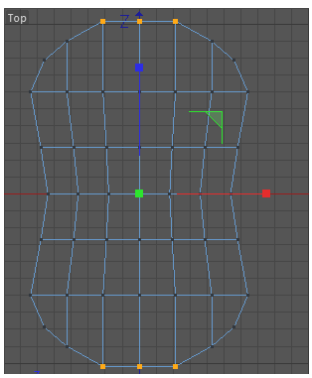

Figure 3-10 *Scaling the selected points of Computer mouse*

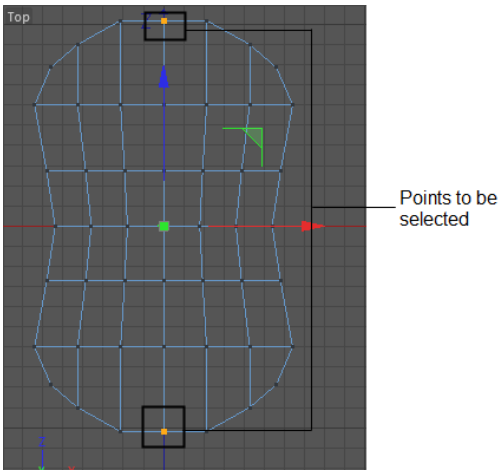

Figure 3-11 *The top and bottom center points of Computer mouse selected*

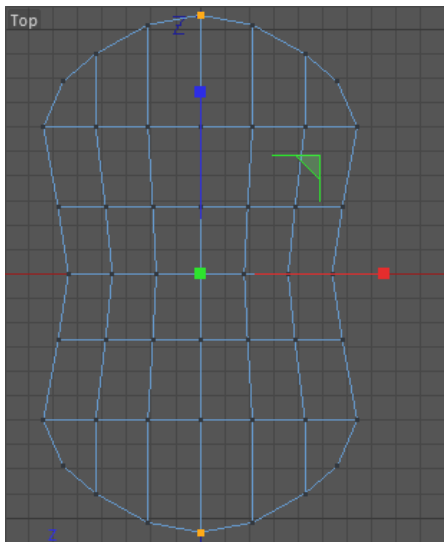

Figure 3-12 *Scaling the selected points of Computer mouse*

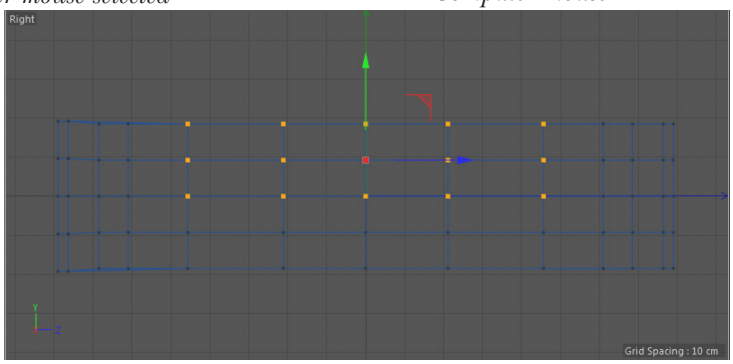

Figure 3-13 *The points to be selected*

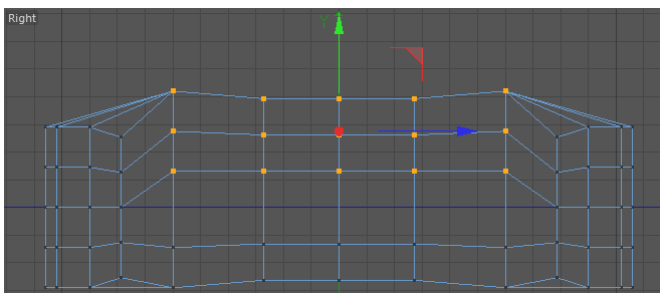

Figure 3-14 *Moving the selected points of Computer mouse*

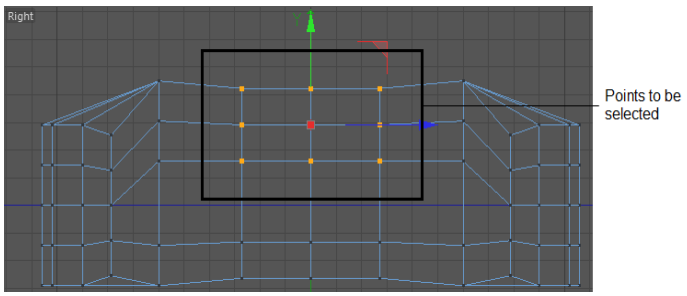

Figure 3-15 *The selected points of Computer mouse*

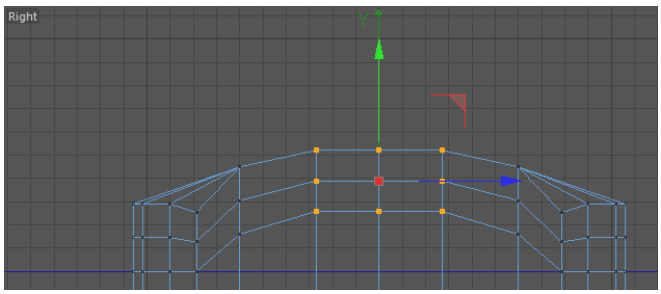

Figure 3-16 *Moving the selected points of Computer mouse*

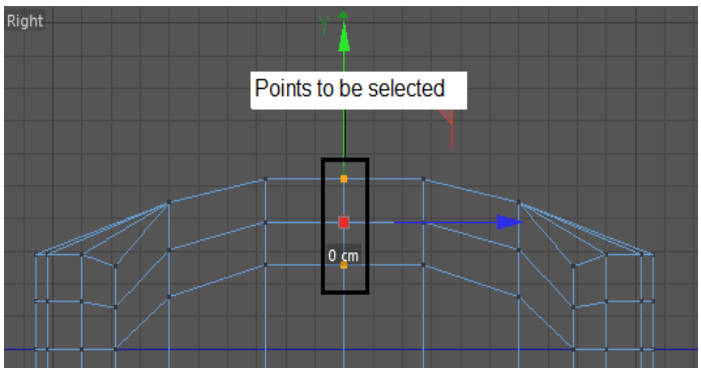

Figure 3-17 *The top center points of Computer mouse selected*

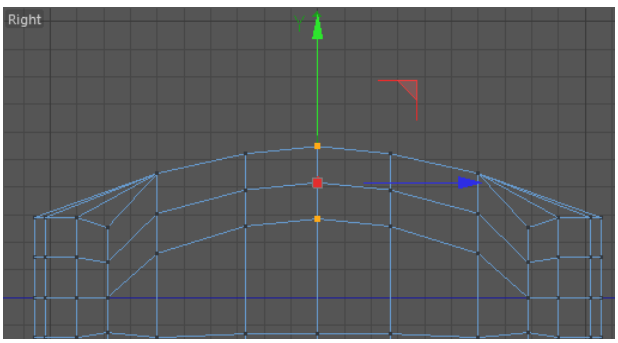

Figure 3-18 *Moving the selected points of Computer mouse*

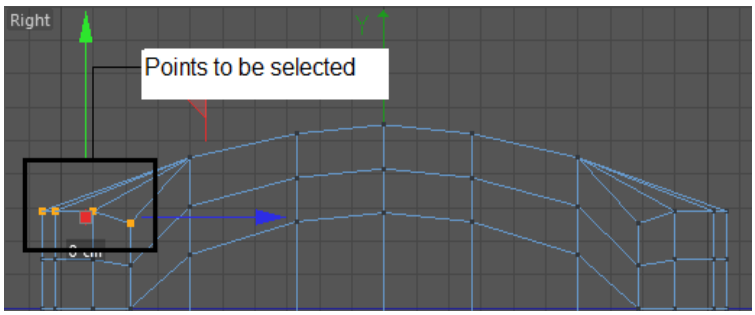

Figure 3-19 *The points to be selected*

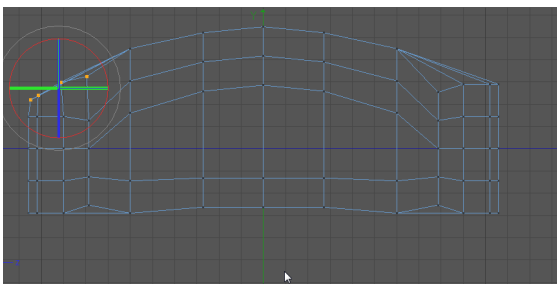

Figure 3-20 *Rotating the selected points of Computer mouse*

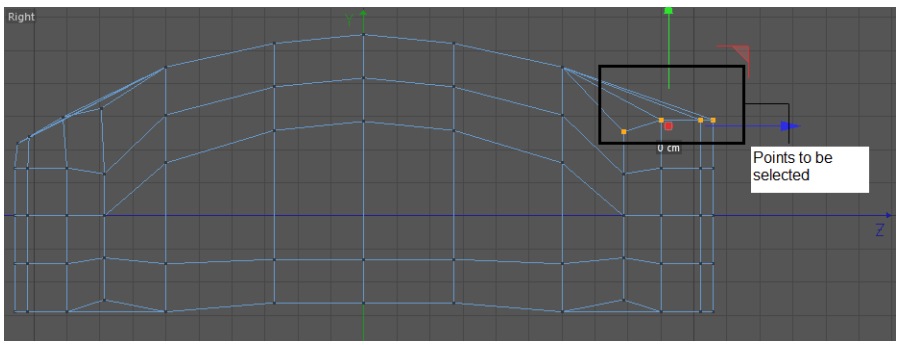

Figure 3-21 *The points to be selected*

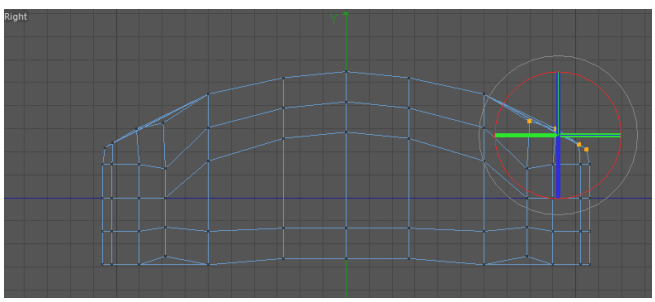

Figure 3-22 *Rotating the selected points of Computer mouse*

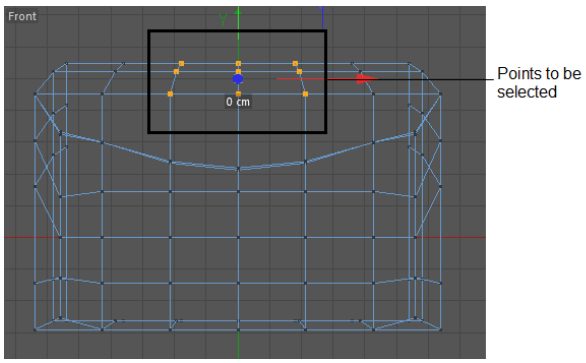

Figure 3-23 *The points to be selected*

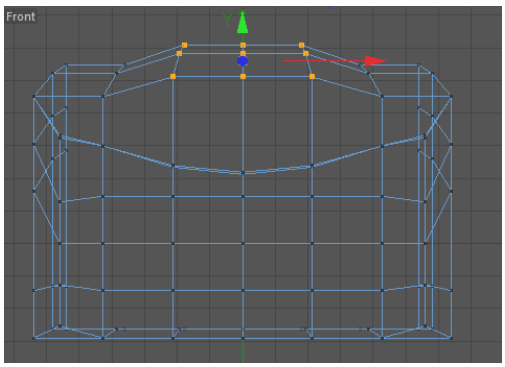

Figure 3-24 *Moving the selected points upward*

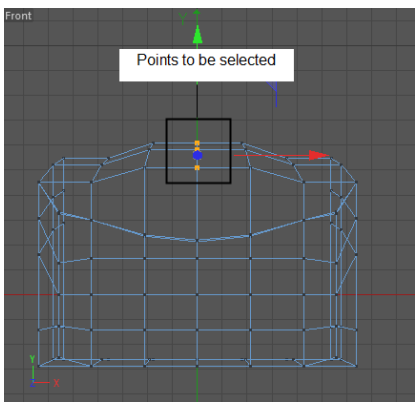

Figure 3-25 *The selected points of Computer mouse*

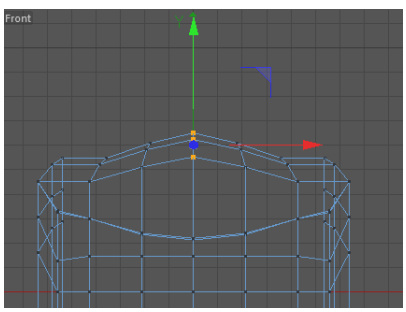

Figure 3-26 *Moving the selected points of Computer mouse*

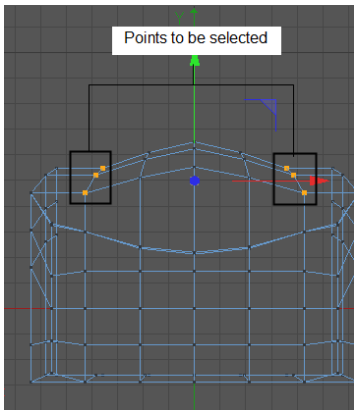

Figure 3-27 *The points to be selected*

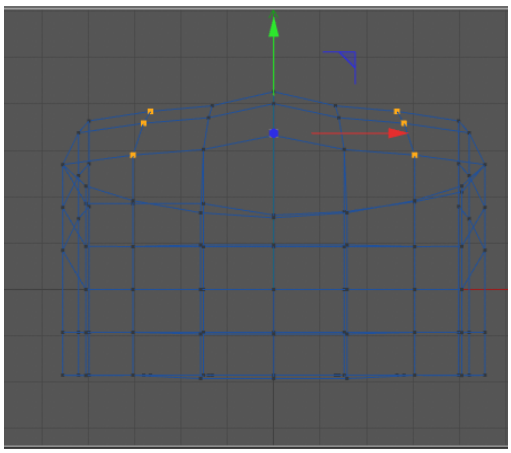

Figure 3-28 *Moving the selected points of Computer mouse*

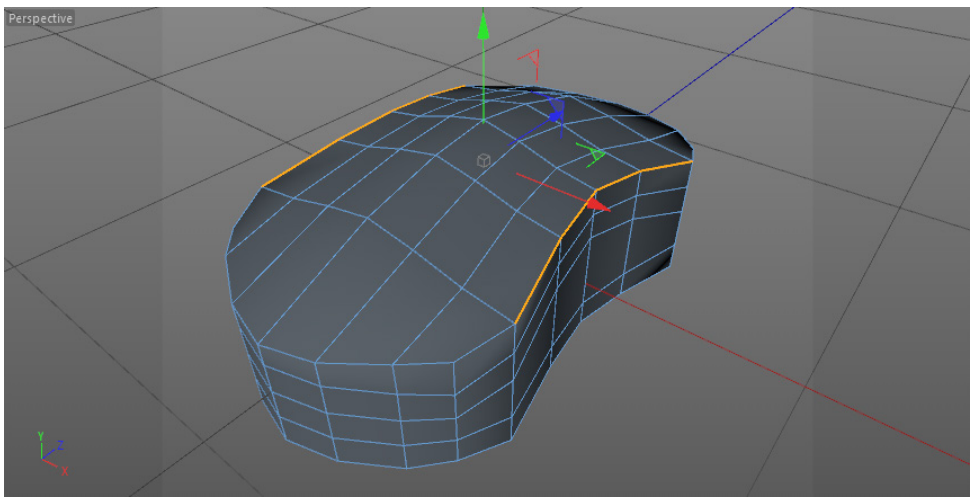

Figure 3-29 *The selected edges in the Perspective viewport*

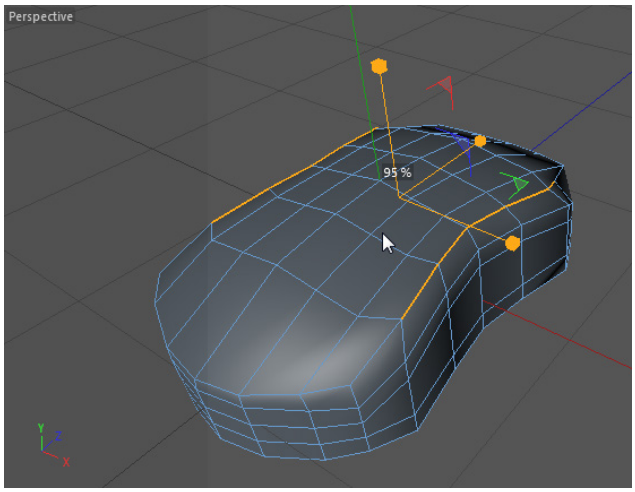

Figure 3-30 *Scaling down the edges of Computer mouse in the Perspective viewport*

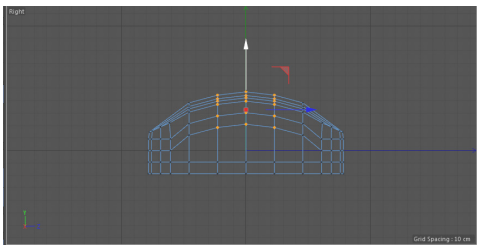

Figure 3-31 *The points to be selected*

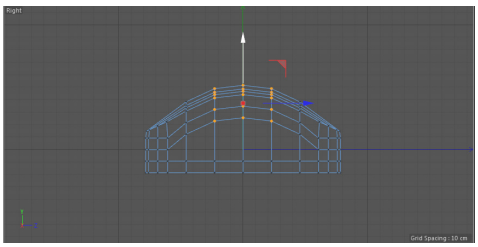

Figure 3-32 *Moving the selected points of Computer mouse*

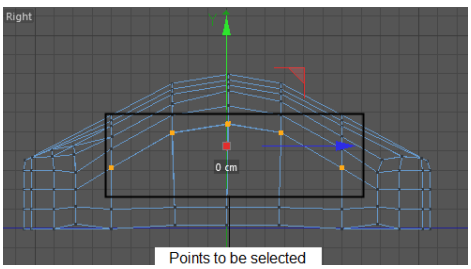

Figure 3-33 *The points to be selected*

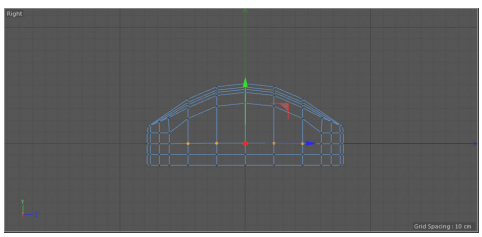

Figure 3-34 *Scaling and moving the points of Computer mouse*

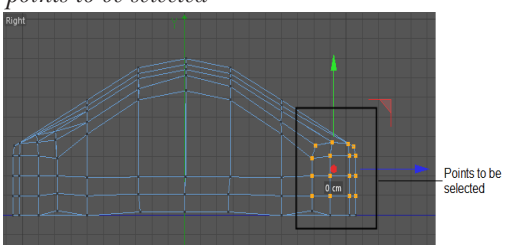

Figure 3-35 *The points of Computer mouse to be selected*

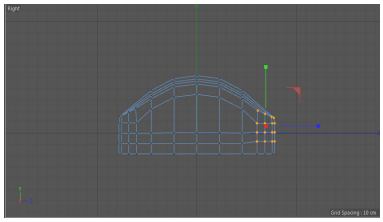

Figure 3-36 *Scaling the points of Computer mouse*

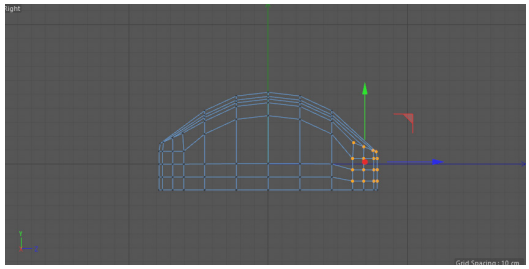

Figure 3-37 *Moving the selected points in the Right viewport*

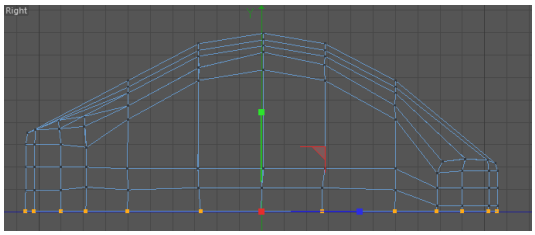

Figure 3-38 *Scaling the points of Computer mouse*

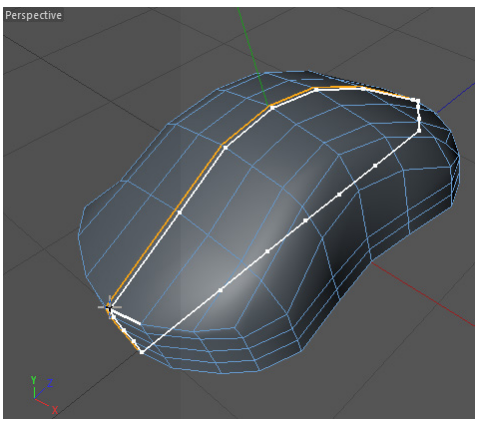

Figure 3-39 *Clicking on the right of the middle edge loop*

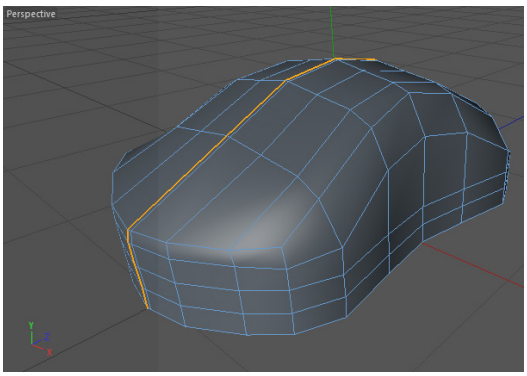

Figure 3-40 *A new edge loop added to the Computer mouse*

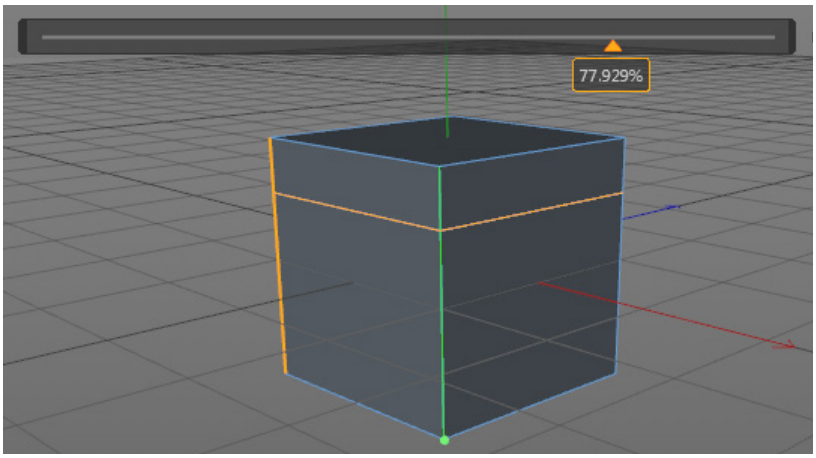

Figure 3-41 *The slider displayed at the top of the viewport*

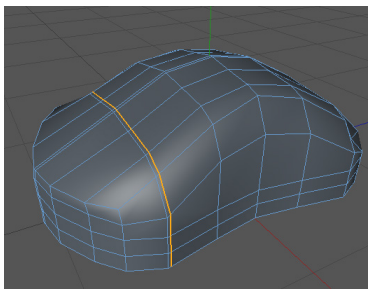

Figure 3-42 *A new edge added to Computer mouse*

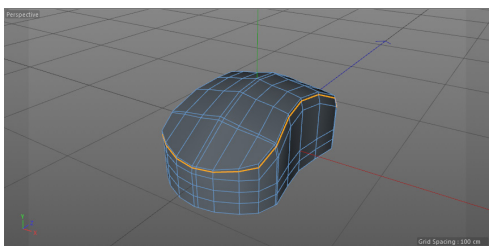

Figure 3-43 *A new edge added to Computer mouse*

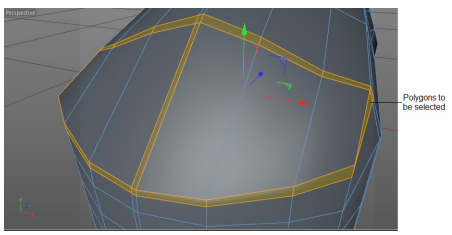

Figure 3-44 *The polygons selected*

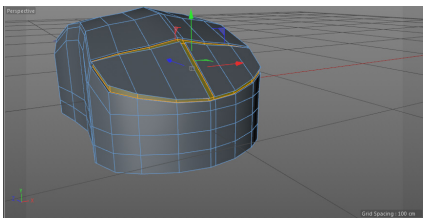

Figure 3-45 *The extruded polygons of Computer mouse*

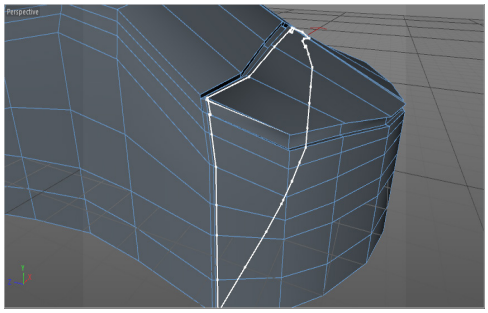

Figure 3-46 *An edge loop added to Computer mouse*

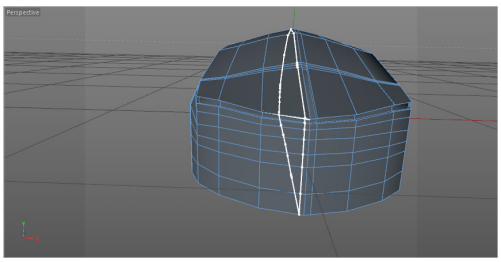

Figure 3-47 *An edge loop added to Computer mouse*

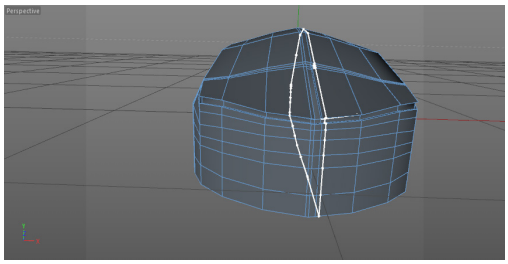

Figure 3-48 *An edge loop added to Computer mouse*

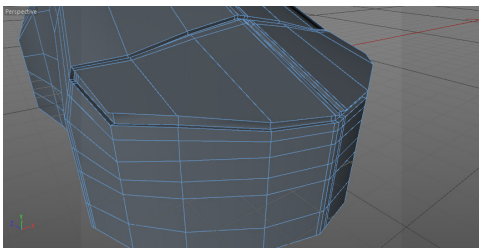

Figure 3-49 *The edges added to Computer mouse*

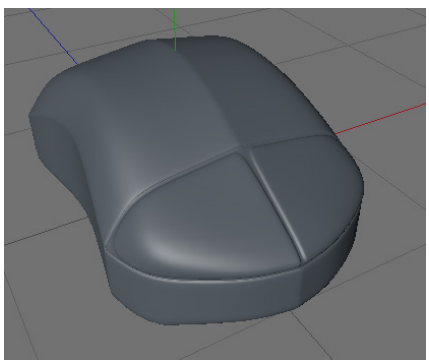

Figure 3-50 *The smoothened Computer mouse*

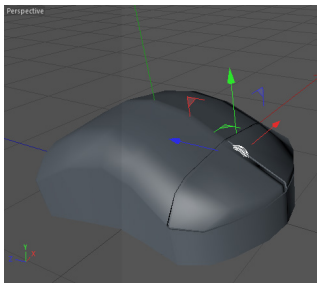

Figure 3-51 *The Scroll wheel placed on Computer mouse*

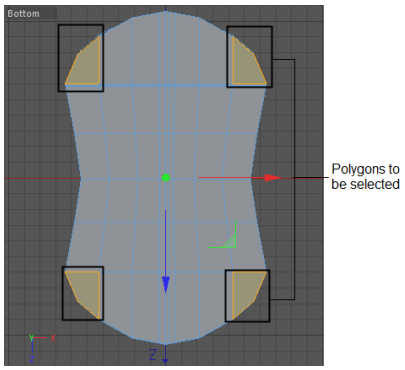

Figure 3-52 *The selected polygons of Computer mouse*

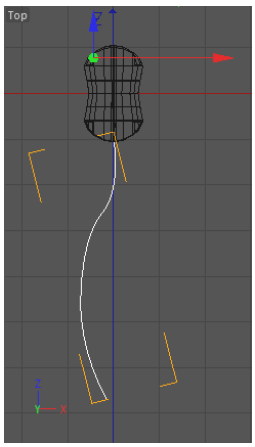

Figure 3-53 *Spline created in the Top viewport*

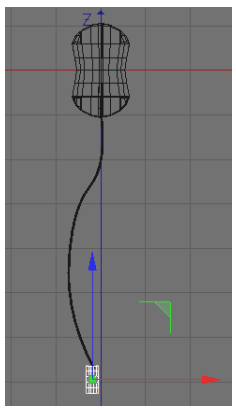

Figure 3-54 *Cube placed in the Top viewport*

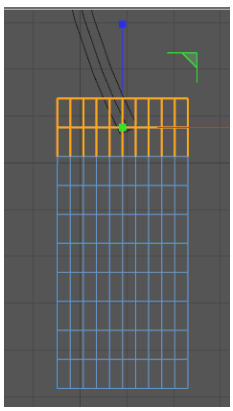

Figure 3-55 *The edges to be selected in the Top viewport*

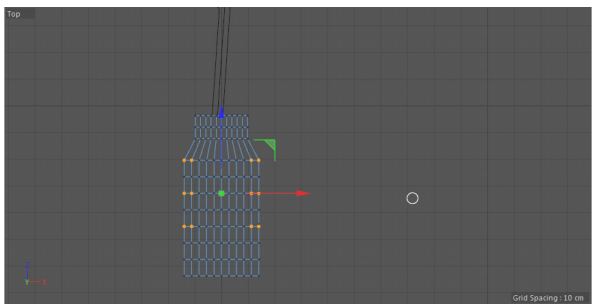

Figure 3-56 *The points to be selected*

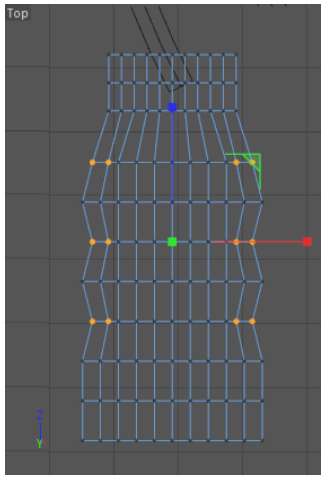

Figure 3-57 *Scaling the selected points*

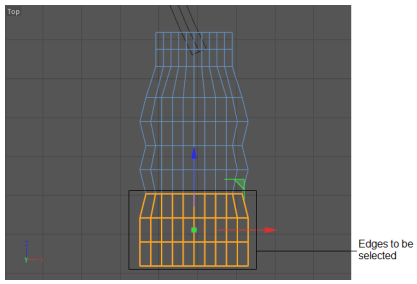

Figure 3-58 *The edges selected*

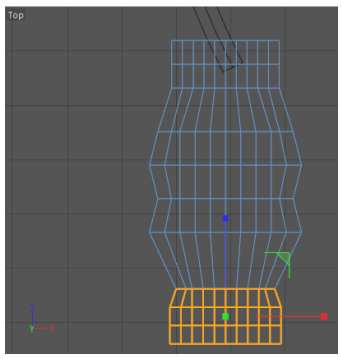

Figure 3-59 *Scaling the selected edges*

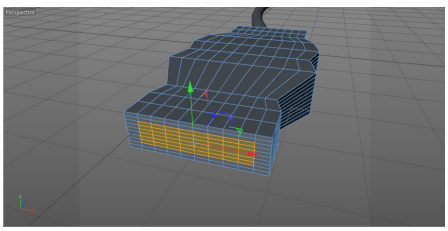

Figure 3-60 *The polygons to be selected*

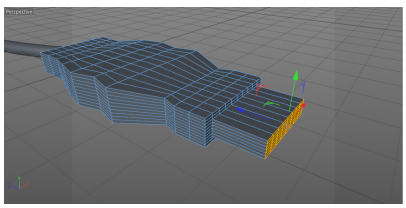

Figure 3-61 *The extruded edge loop*

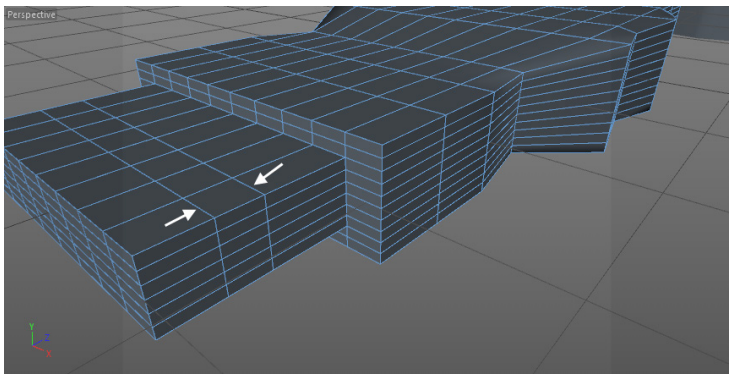

Figure 3-62 *The edges to be added*

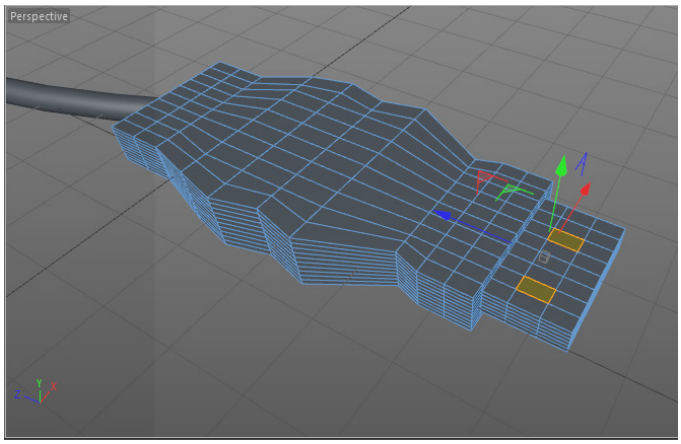

Figure 3-63 *The polygons to be selected*

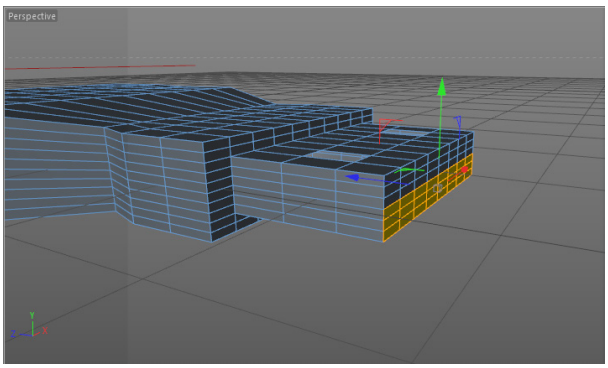

Figure 3-64 *The selected polygons*

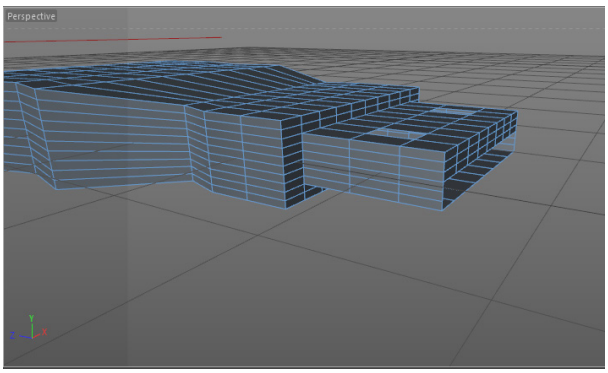

Figure 3-65 *The deleted polygons*



Figure 3-66 *The model of computer table*

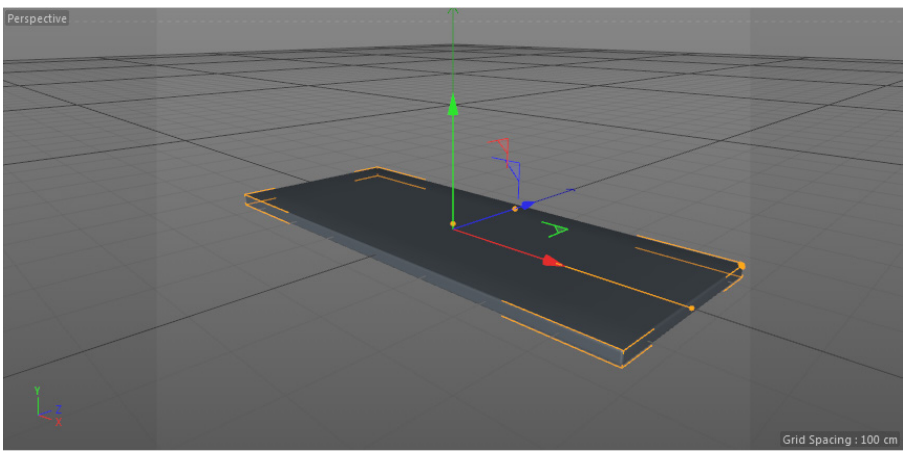

Figure 3-67 *The Computer table in the Perspective viewport*

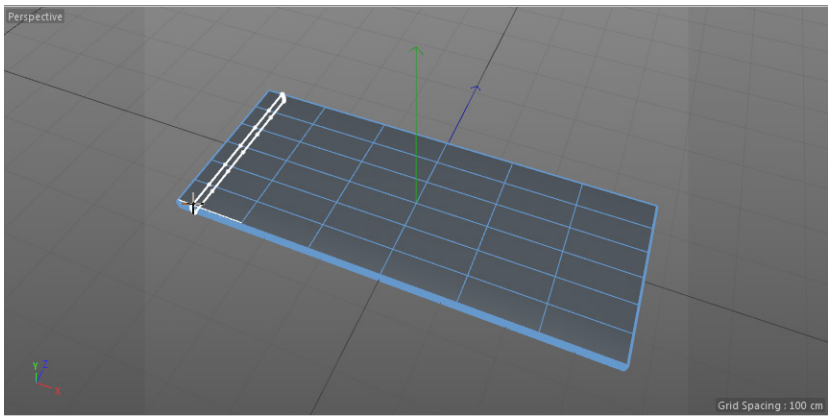

Figure 3-68 *Adding an edge loop*

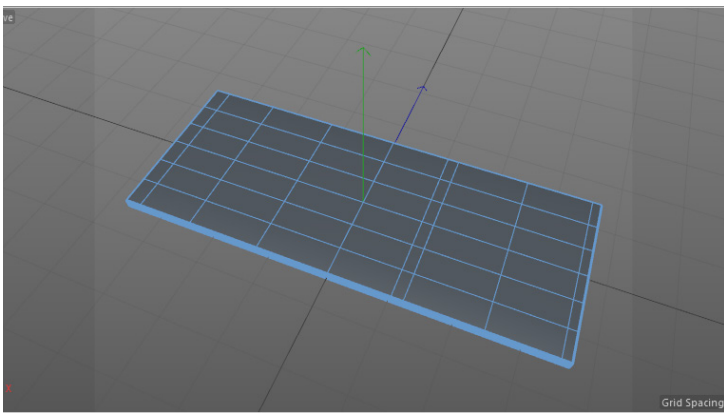

Figure 3-69 *The edge loops added*

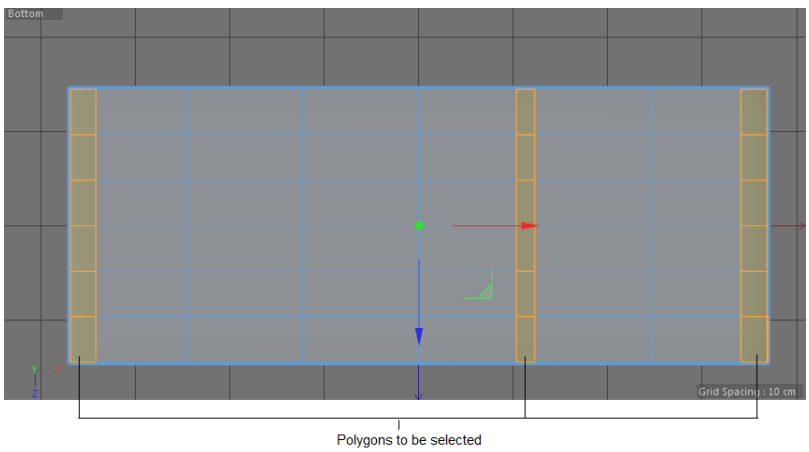

Figure 3-70 *The selected polygons of Computer table*

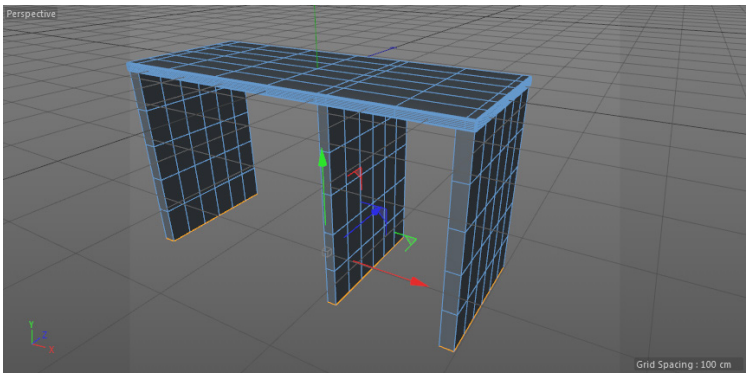

Figure 3-71 *The selected polygons extruded in the Perspective viewport*

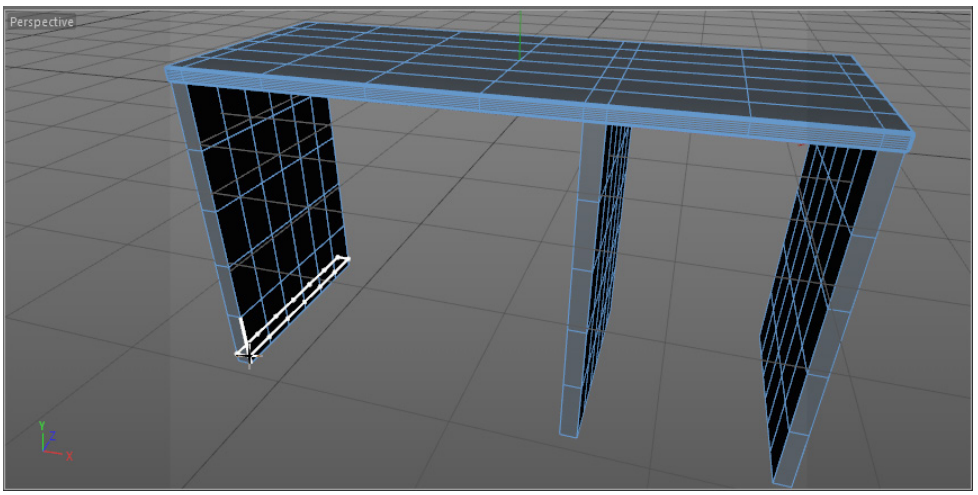

Figure 3-72 *Clicking on edge to create a new edge loop*

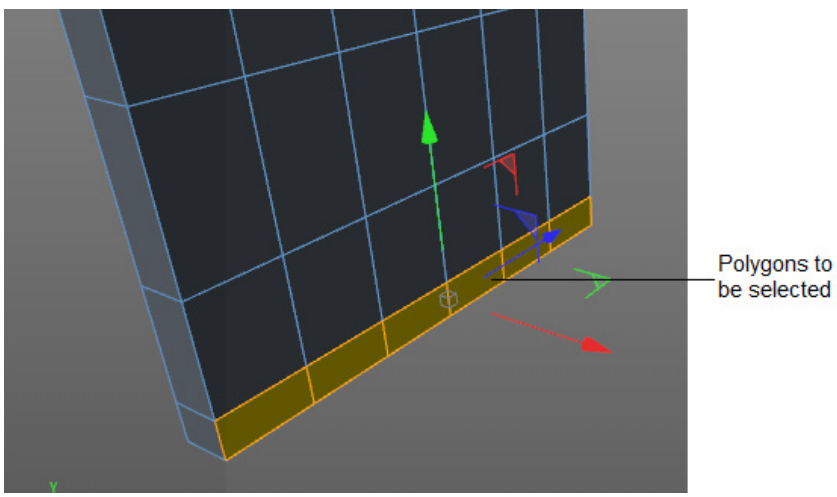

Figure 3-73 *The selected polygons of Computer table*

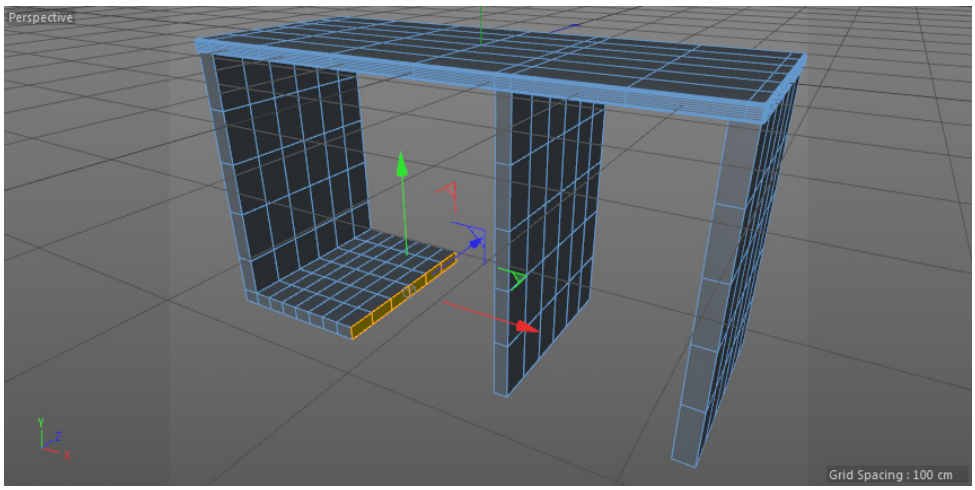

Figure 3-74 *The selected polygons extruded in the Perspective viewport*

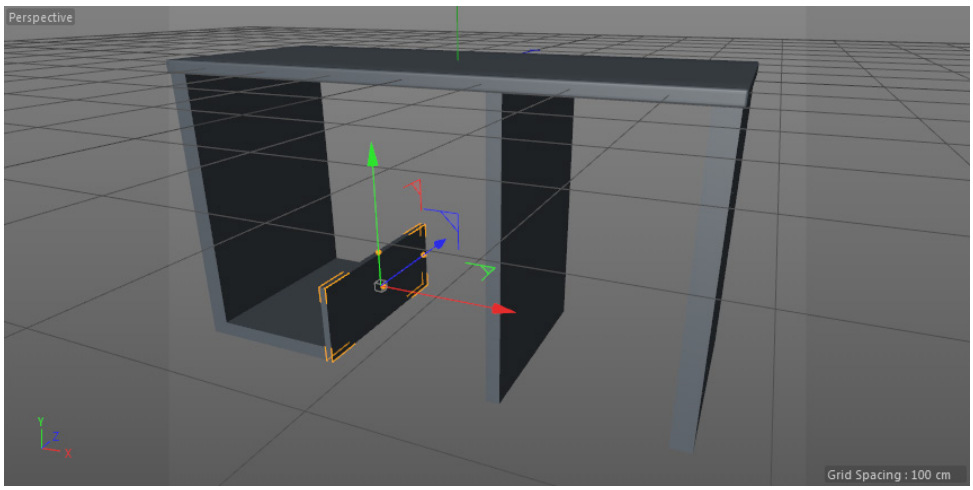

Figure 3-75 *Cube aligned in the Perspective viewport*

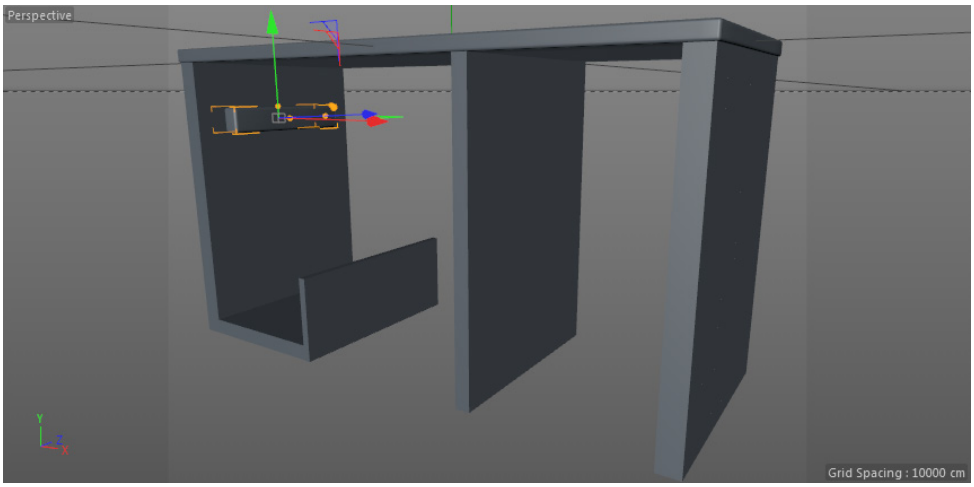

Figure 3-76 *Cube.1 positioned in the Perspective viewport*

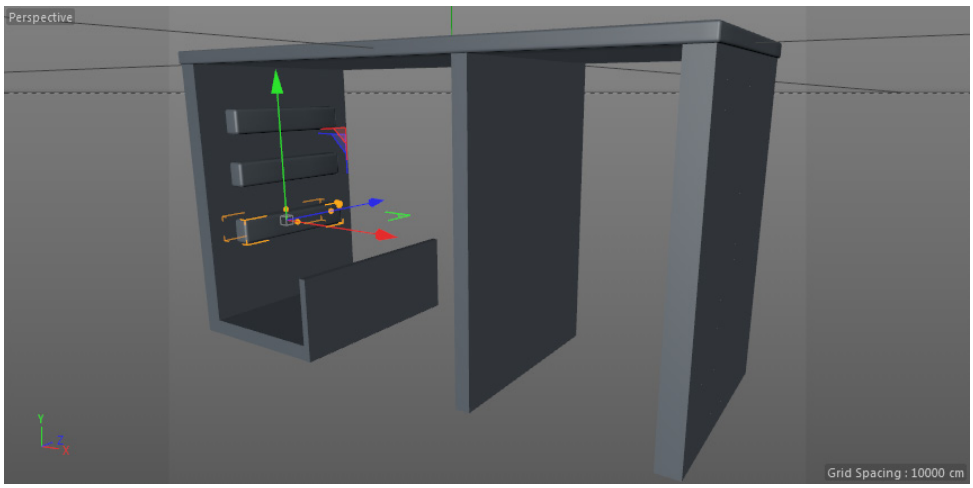

Figure 3-77 *Left side positioned in the Perspective viewport*

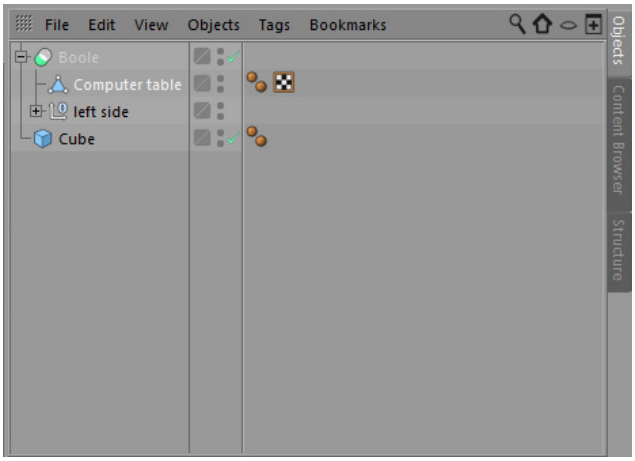

Figure 3-78 *Boole connected to Computer table*

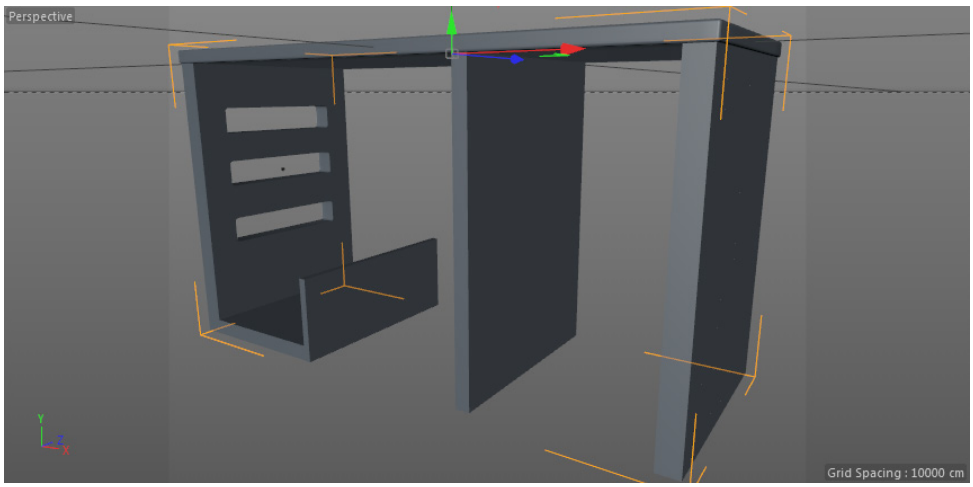

Figure 3-79 *The holes created in the side support of the Computer table*

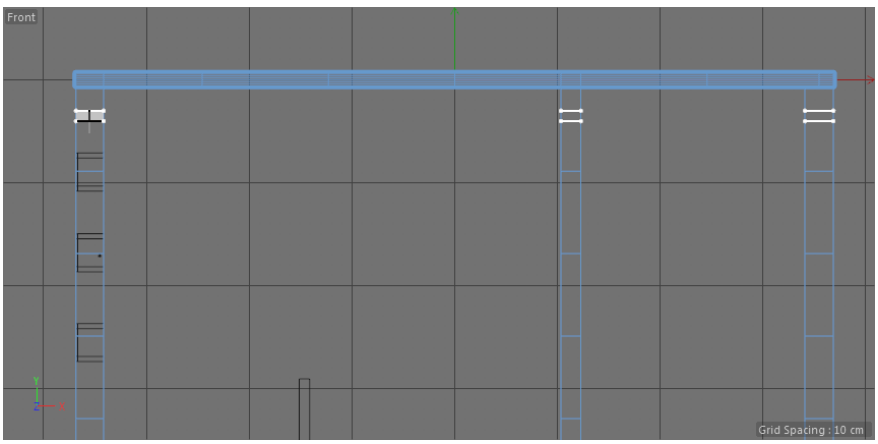

Figure 3-80 *Creating an edge using the* ***Plane Cut*** *tool*

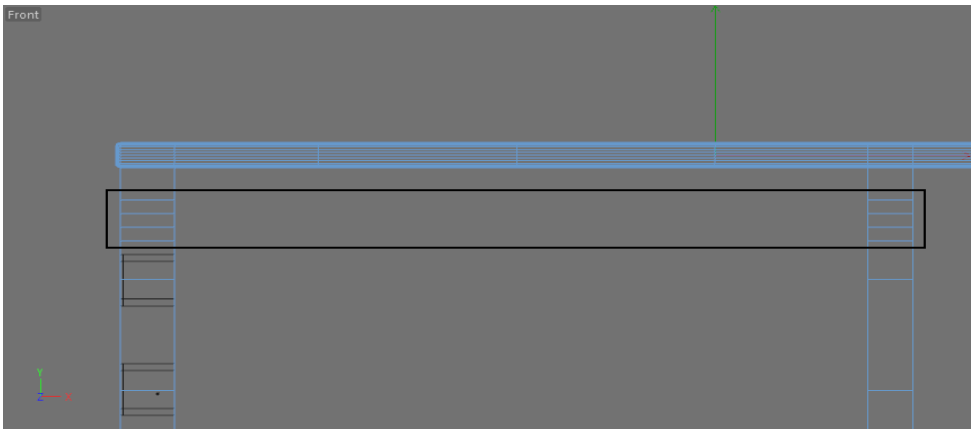

Figure 3-81 *Four new edge loops added to the Computer table*

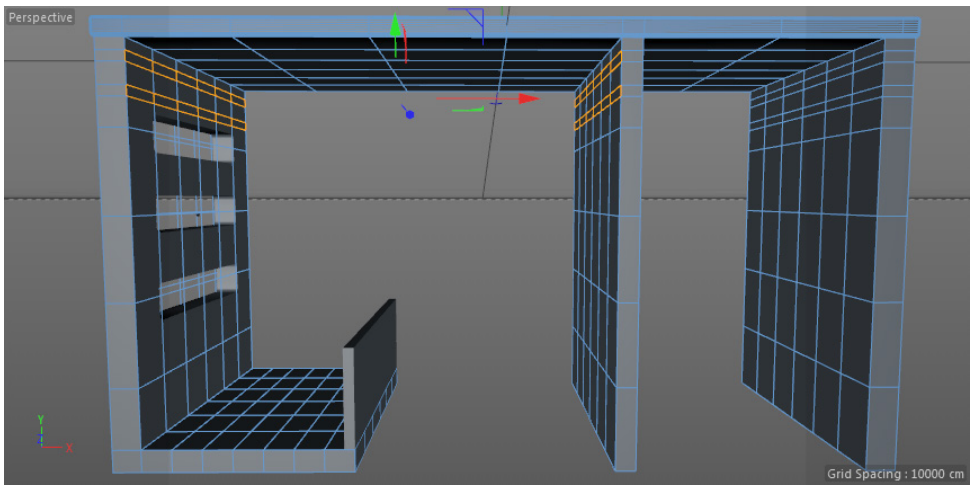

Figure 3-82 *The selected polygons of Computer table*

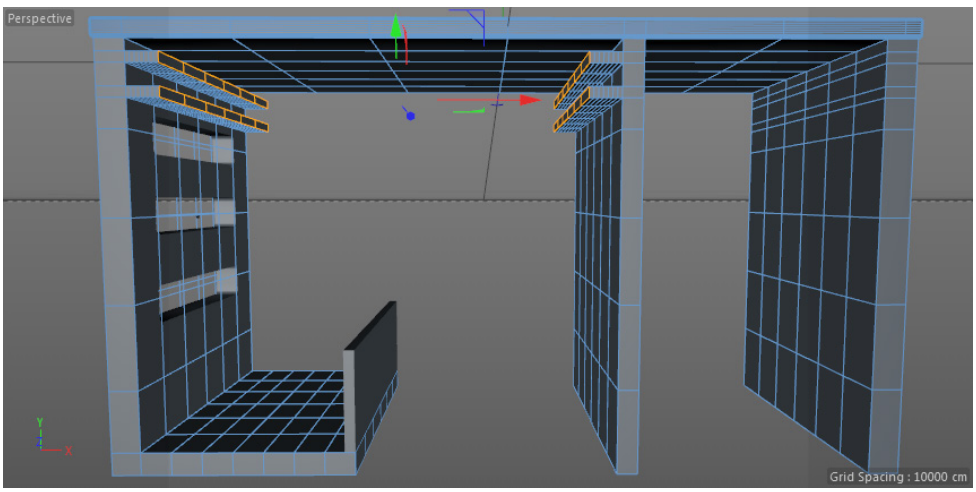

Figure 3-83 *The selected polygons extruded in the Perspective viewport*

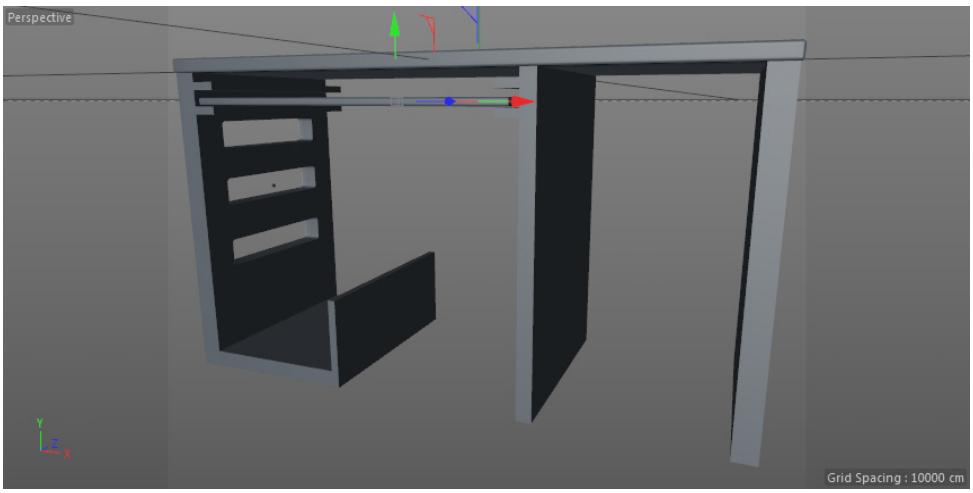

Figure 3-84 *The Keyboard support of Computer table*

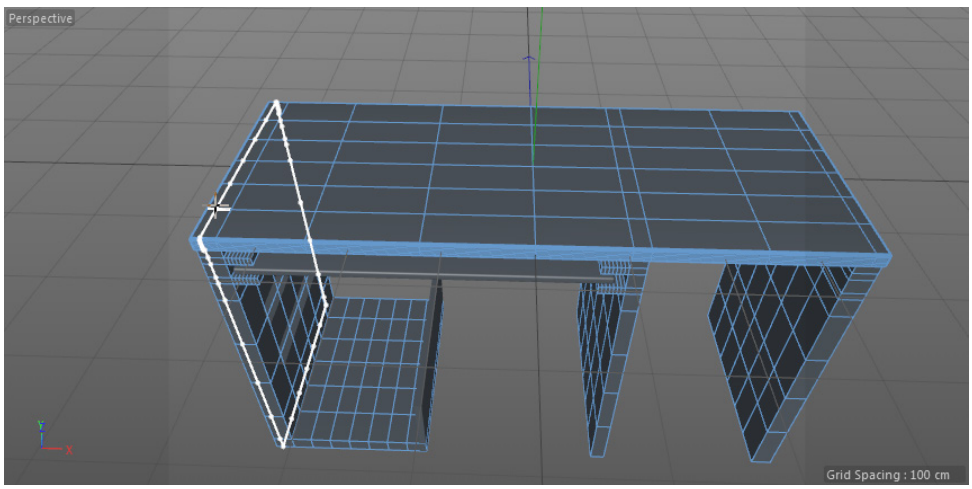

Figure 3-85 *New edge loop created*

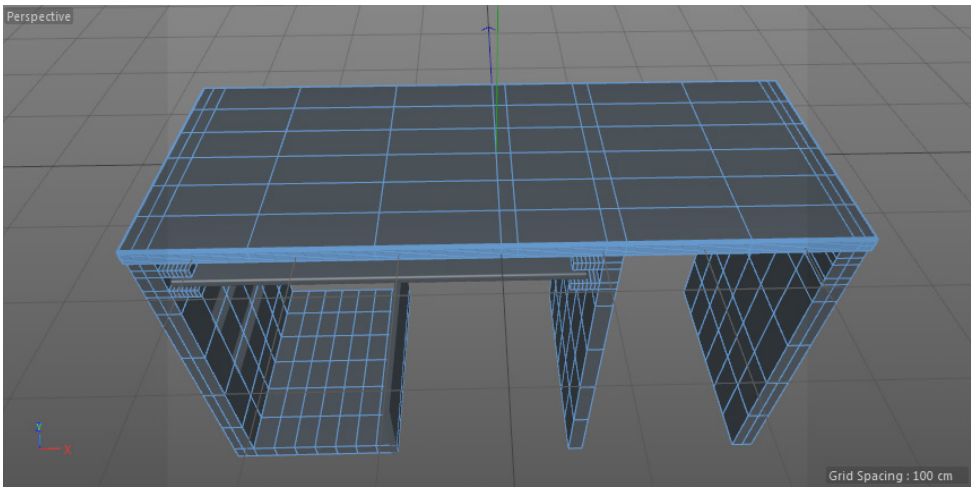

Figure 3-86 *Another edge loop added to Computer table*

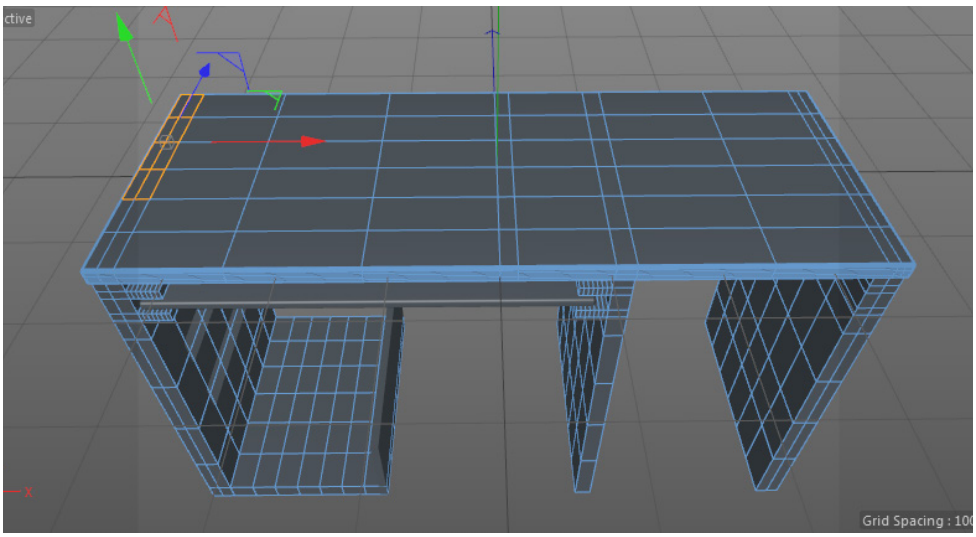

Figure 3-87 *The selected polygons of Computer table*

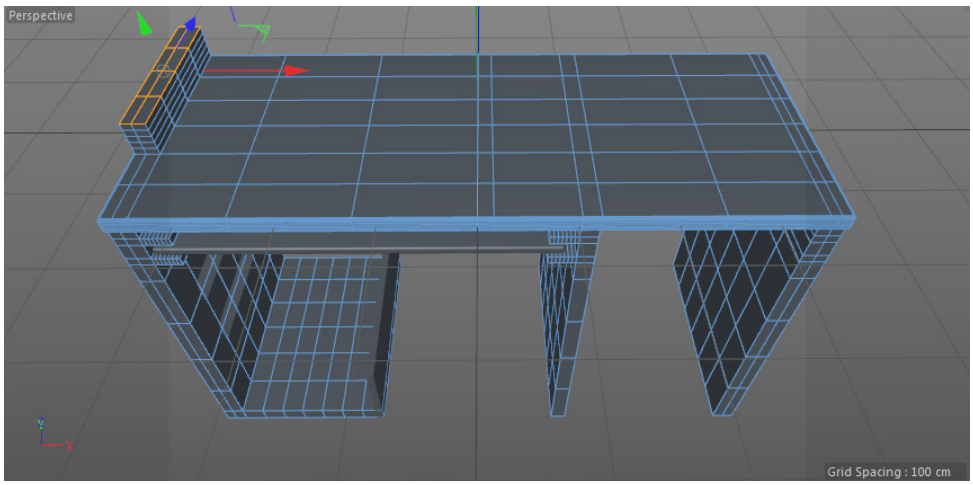

Figure 3-88 *The selected polygons extruded in the Perspective viewport*

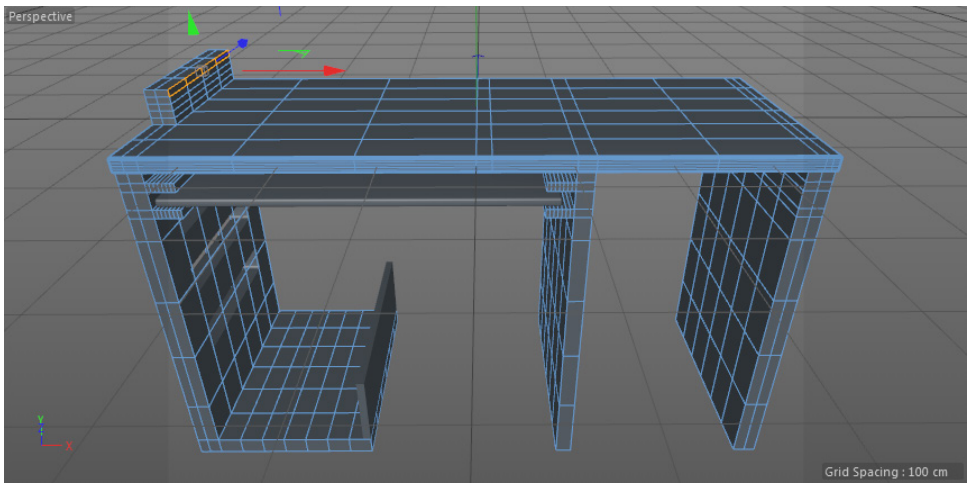

Figure 3-89 *The selected polygons of Computer table*

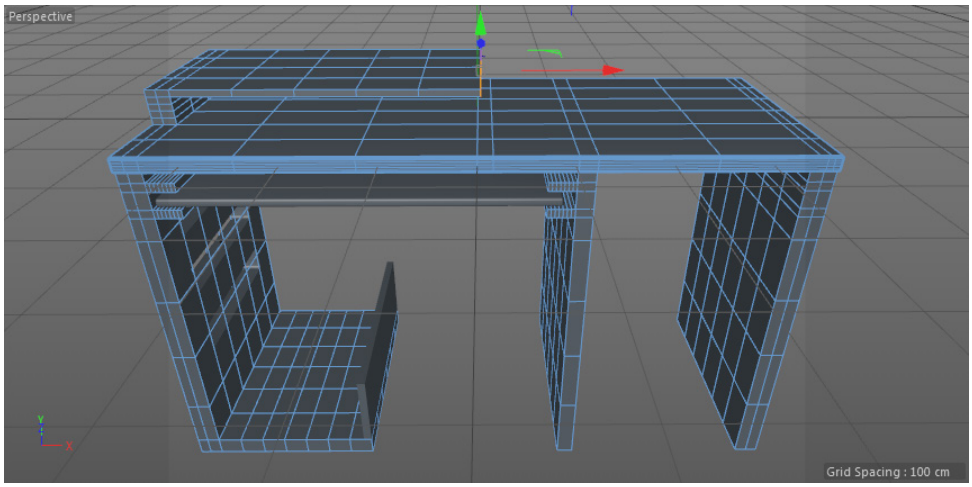

Figure 3-90 *The selected polygons extruded in the Perspective viewport*

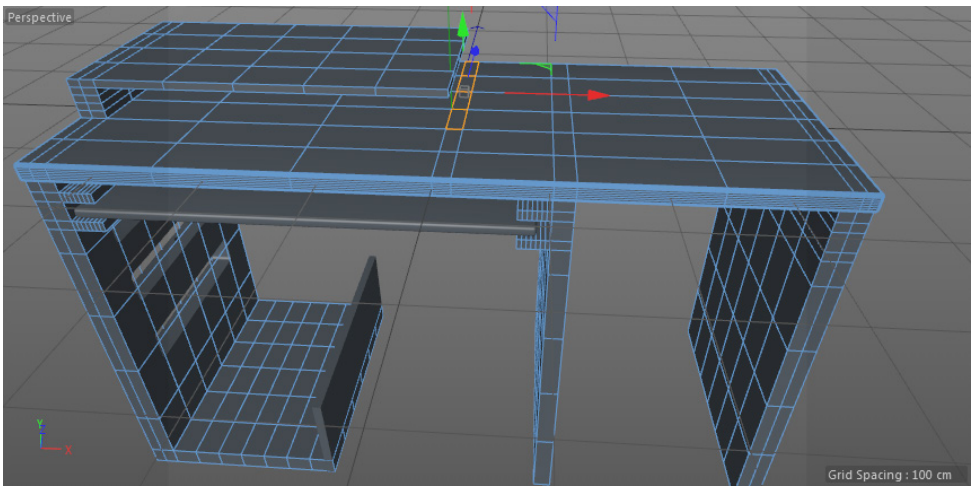

Figure 3-91 *The selected polygons of Computer table*

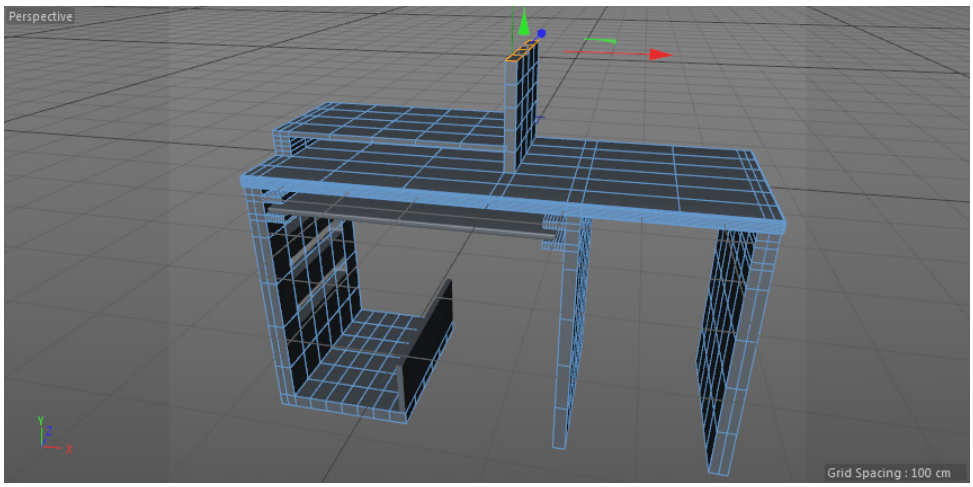

Figure 3-92 *The selected polygons extruded in the Perspective viewport*

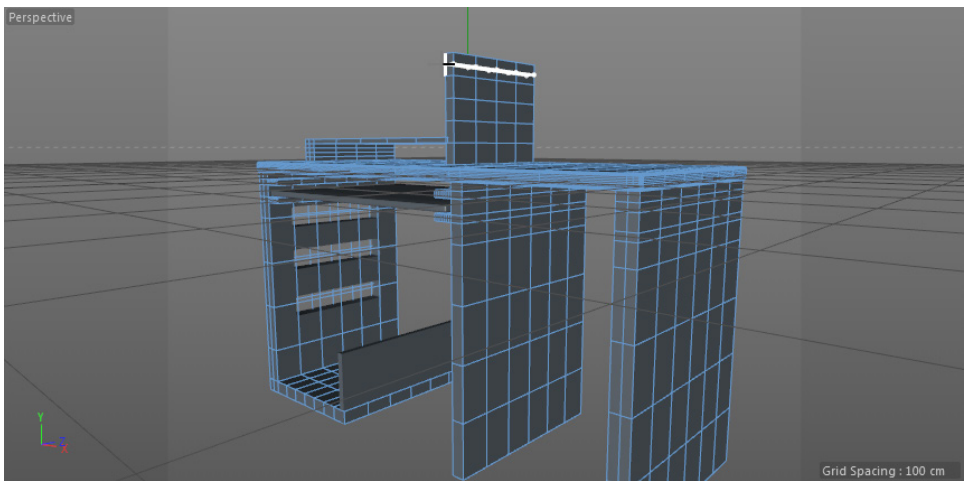

Figure 3-93 *Clicking on edge to create a new edge loop*

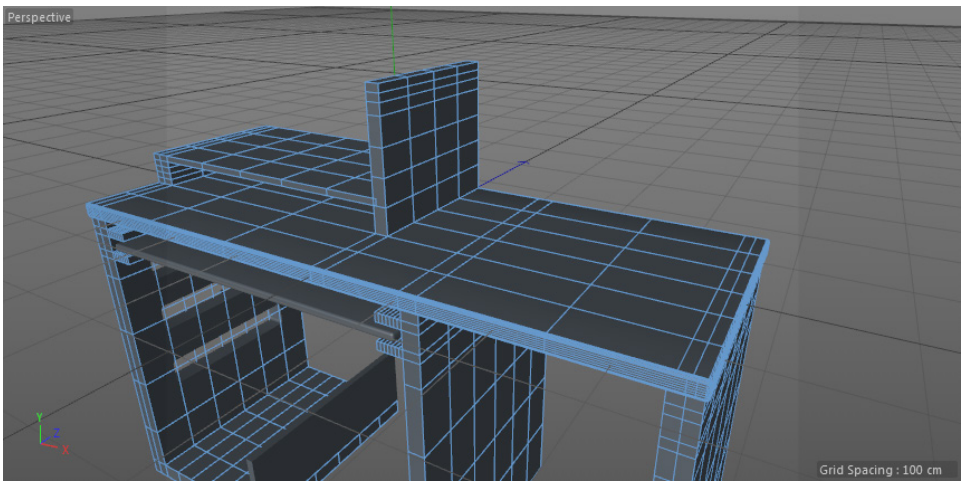

Figure 3-94 *Two new edge loops added to the Computer table*

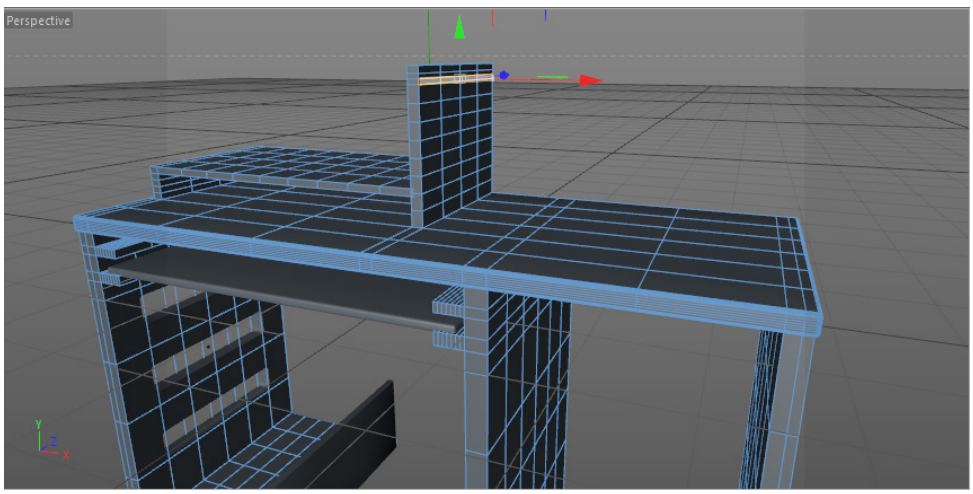

Figure 3-95 *The selected polygons of Computer table*

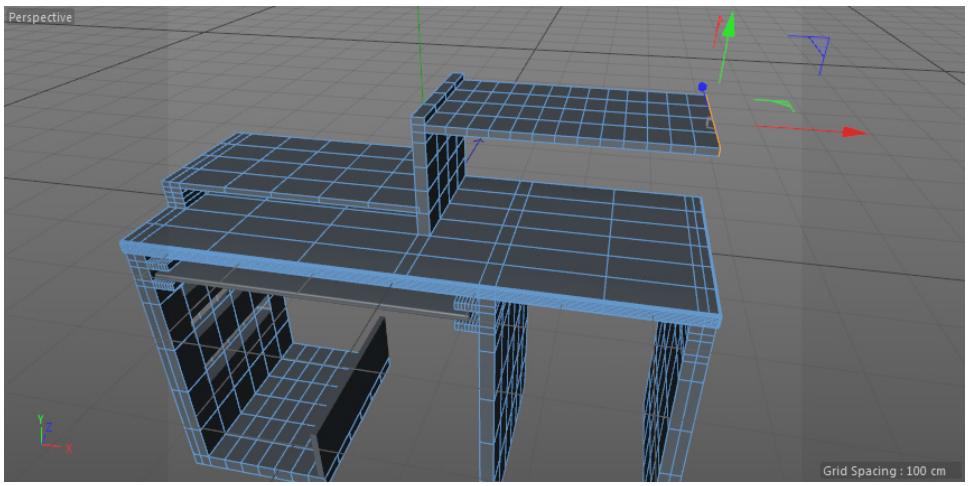

Figure 3-96 *The selected polygons extruded in the Perspective viewport*

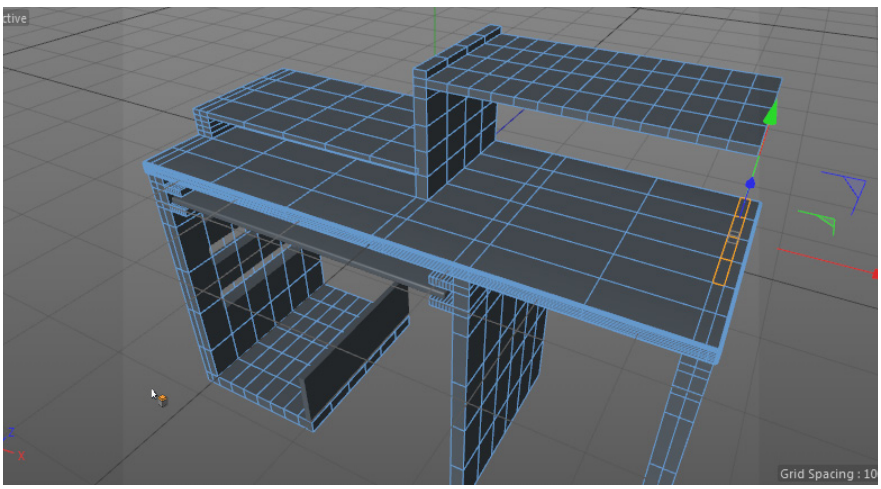

Figure 3-97 *The selected polygons of Computer table*

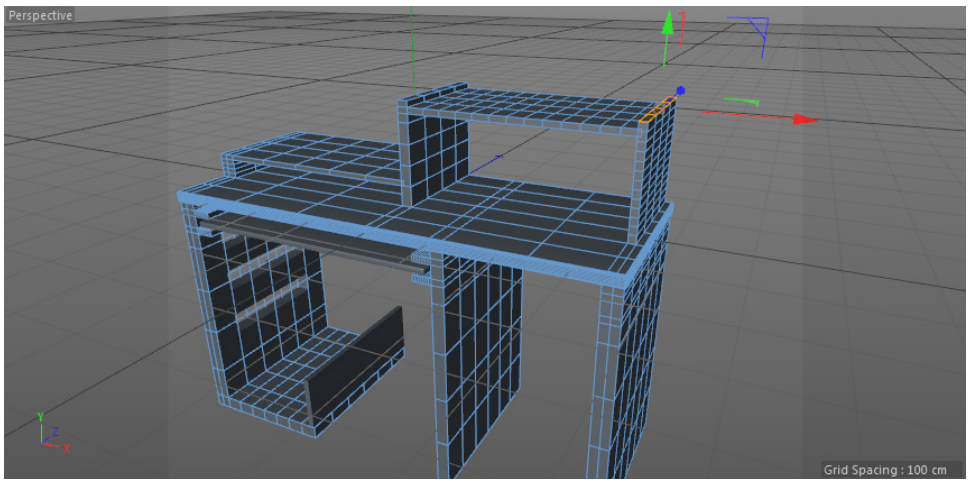

Figure 3-98 *The selected polygons extruded in the Perspective viewport*

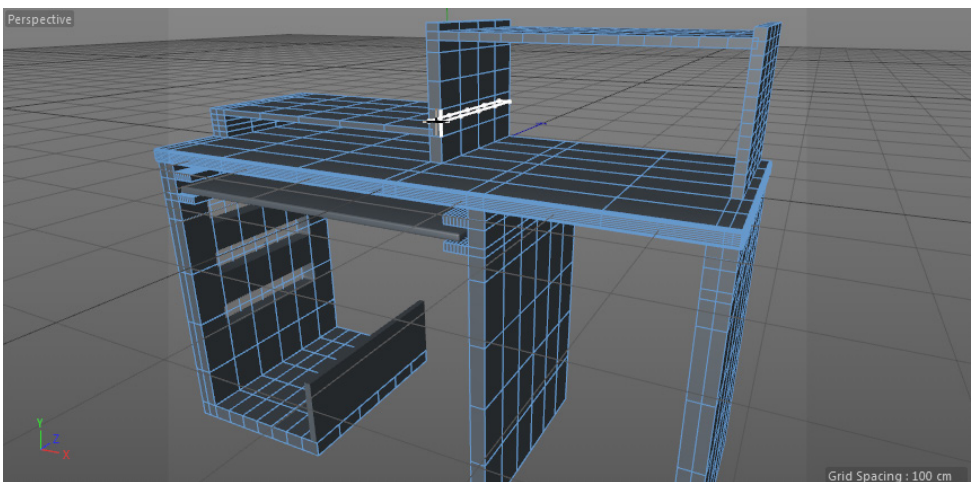

Figure 3-99 *Clicking on edge to create a new edge loop*

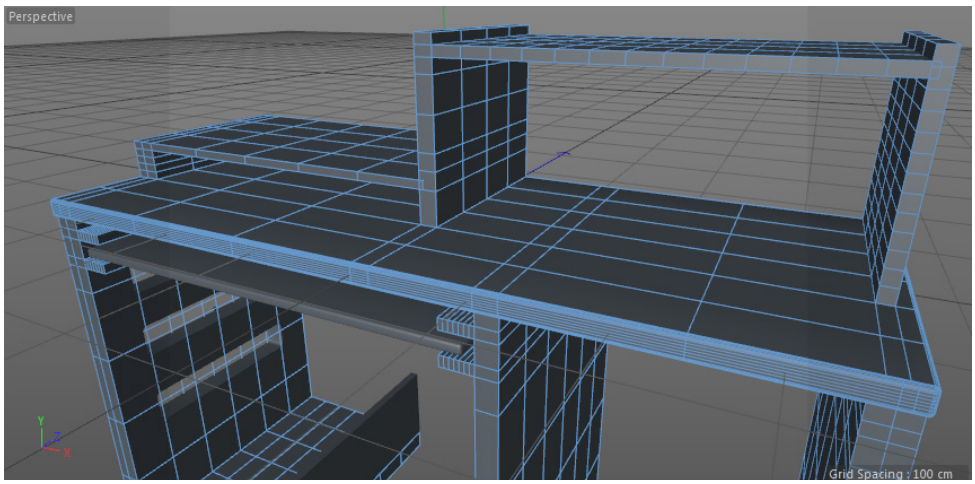

Figure 3-100 *The new edge loop added to the Computer table*

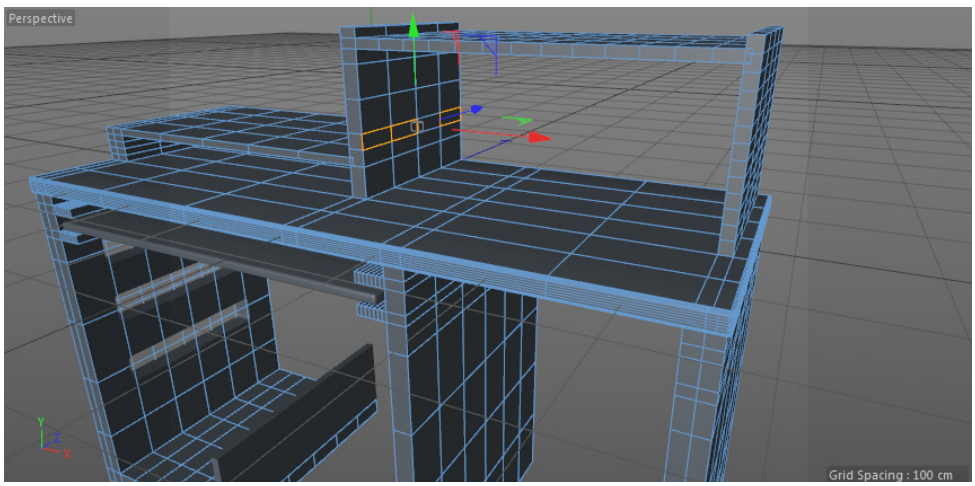

Figure 3-101 *The selected polygons of Computer table*

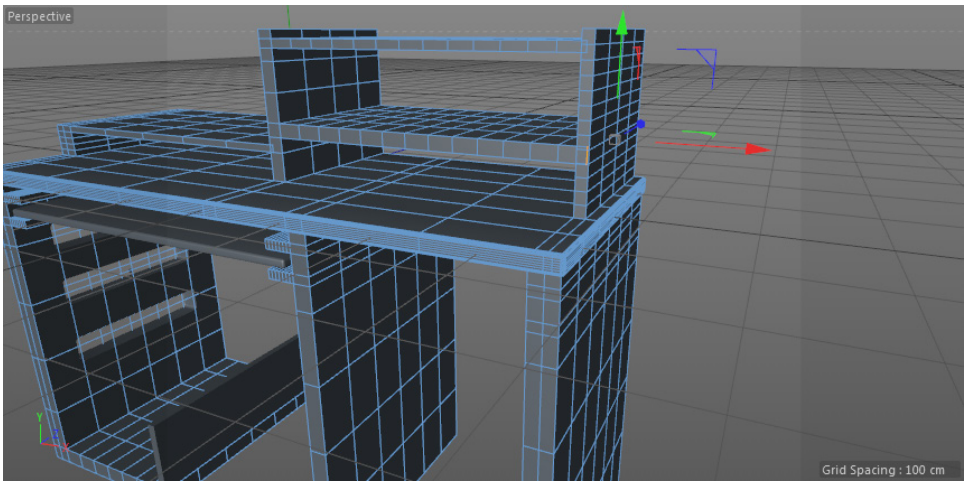

Figure 3-102 *The selected polygons extruded in the Perspective viewport*

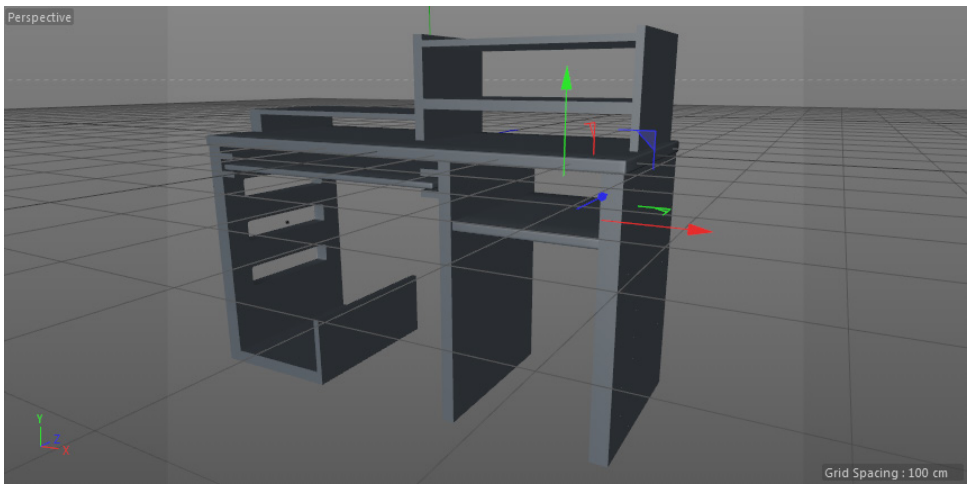

Figure 3-103 *Shelf1 positioned in the Perspective viewport*

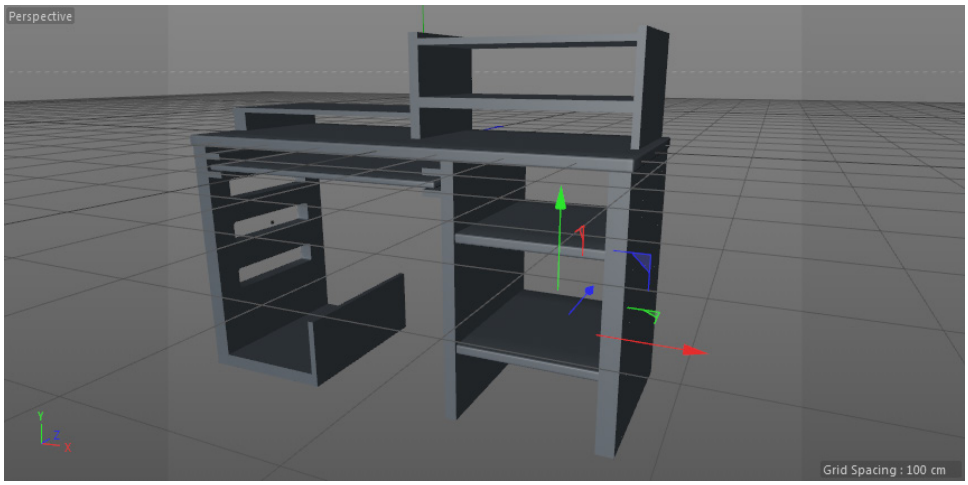

Figure 3-104 *Shelf1.1 positioned in the Perspective viewport*

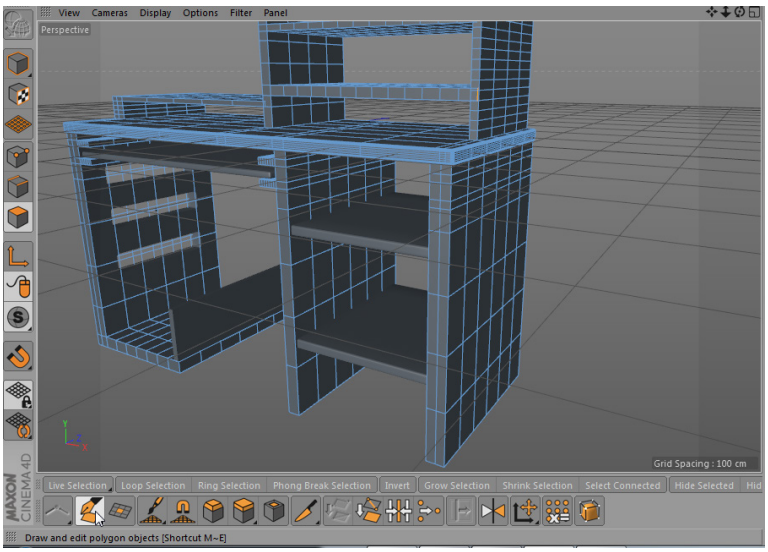

Figure 3-105 *Choosing the* ***Polygon Pen*** *tool from the Modeling Tool Palette*

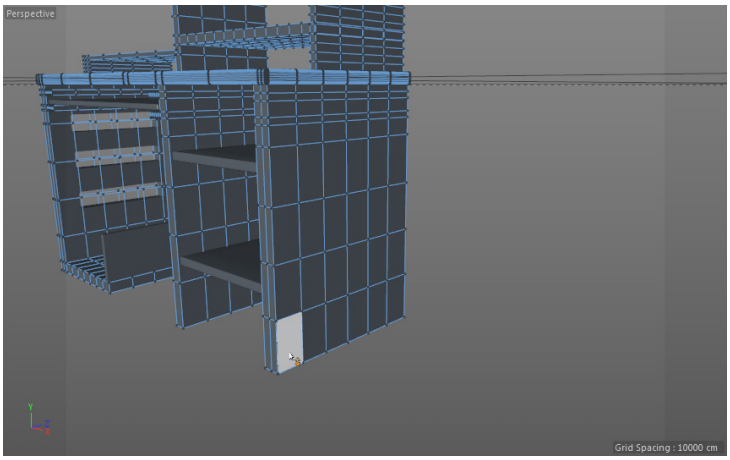

Figure 3-106 *The highlighted polygon*

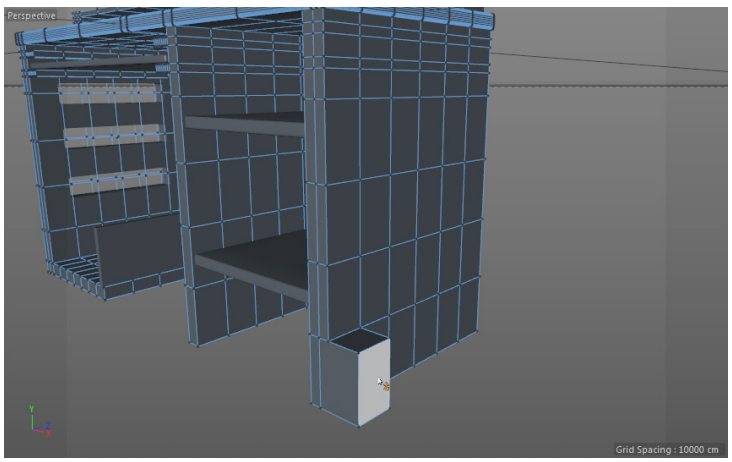

Figure 3-107 *Dragging the highlighted polygon*

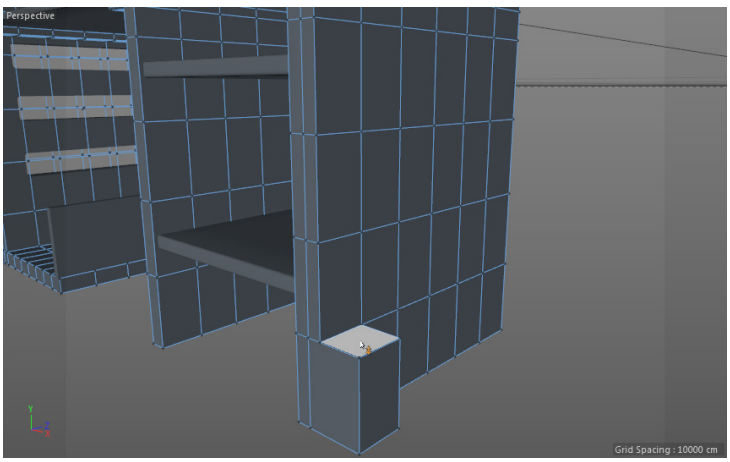

Figure 3-108 *The highlighted polygon of magazine stand*

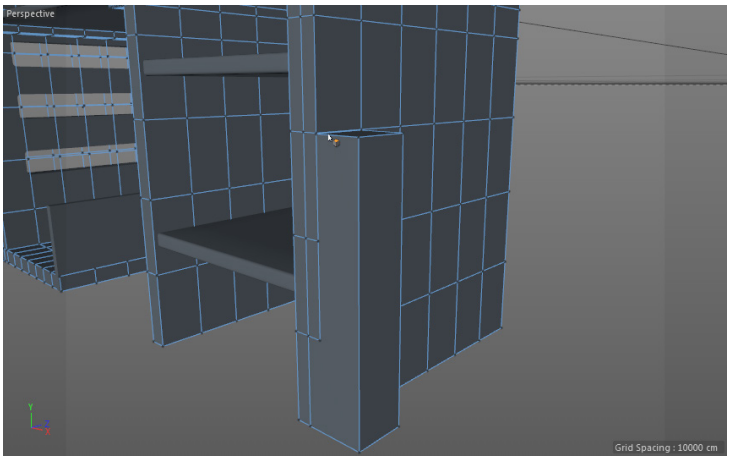

Figure 3-109 *Dragging the highlighted polygon*

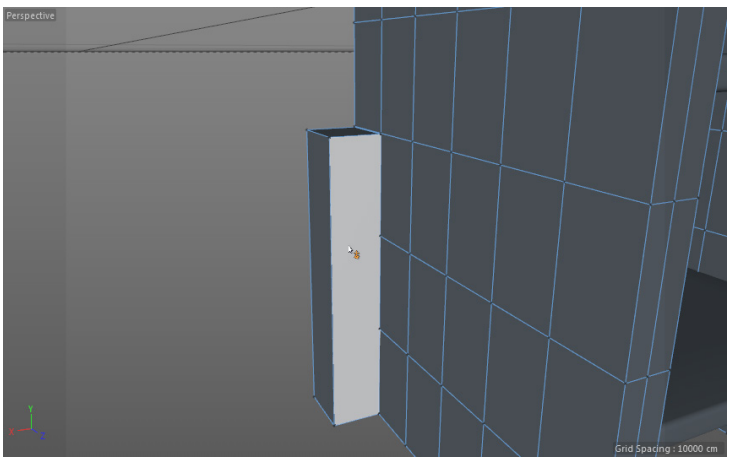

Figure 3-110 *Highlighted polygon*

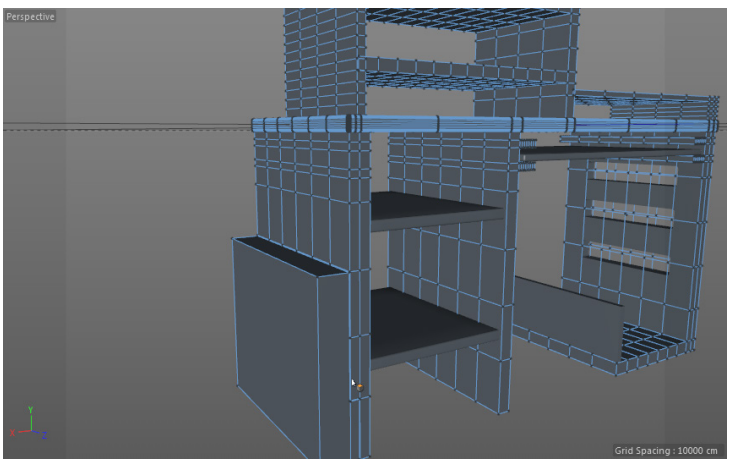

Figure 3-111 *Dragging the highlighted polygon*

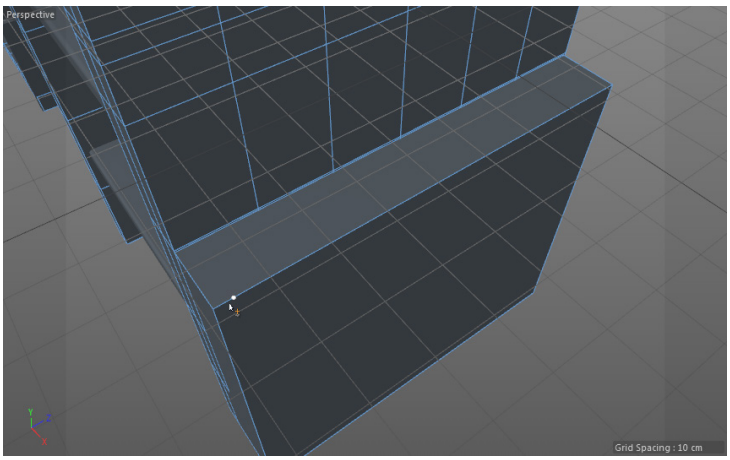

Figure 3-112 *Clicking on an edge*

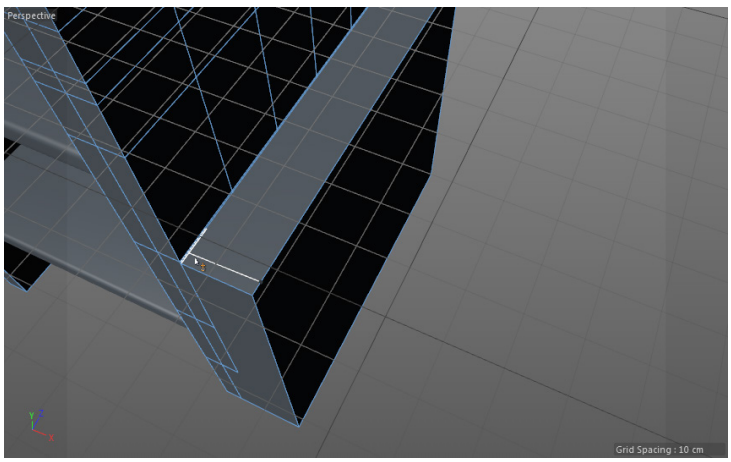

Figure 3-113 *Clicking on second edge to create a new edge*

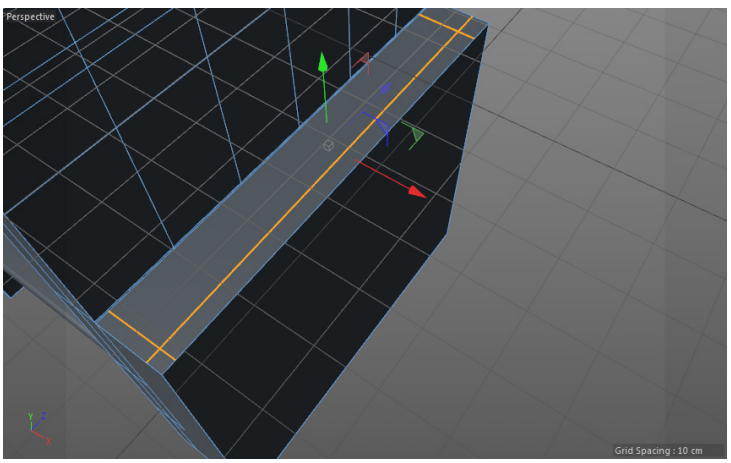

Figure 3-114 *Three new edges added to the magazine stand*

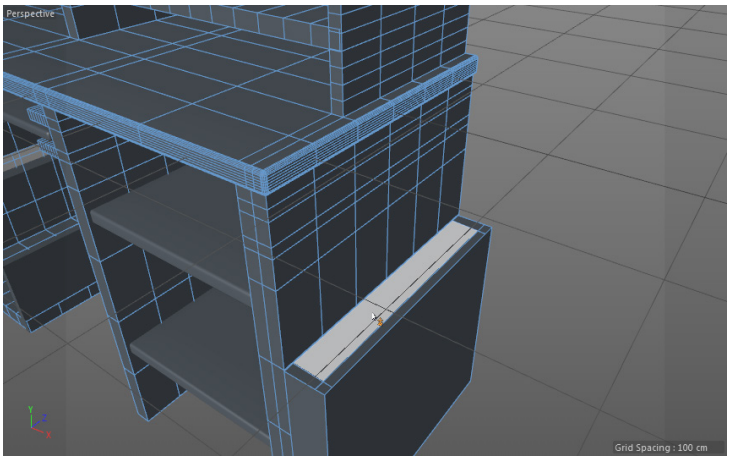

Figure 3-115 *Highlighted polygon*

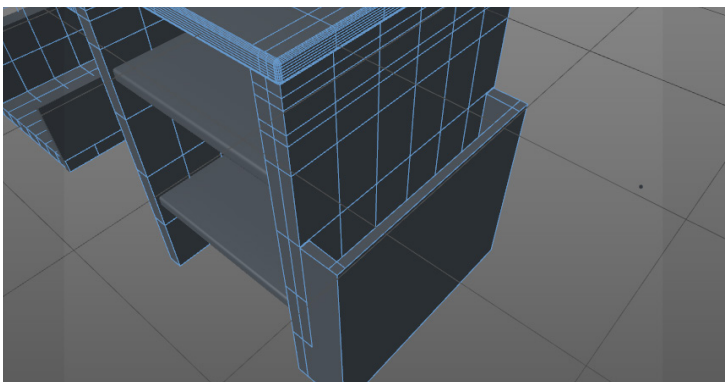

Figure 3-116 *Dragging the highlighted polygon downward*

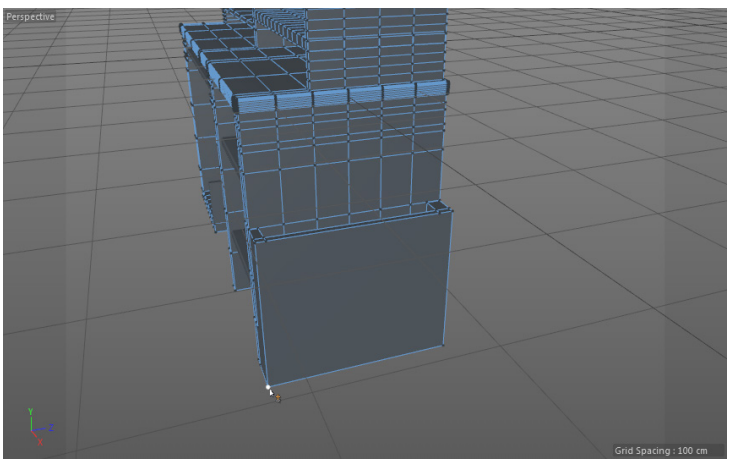

Figure 3-117 *Clicking on the corner point*

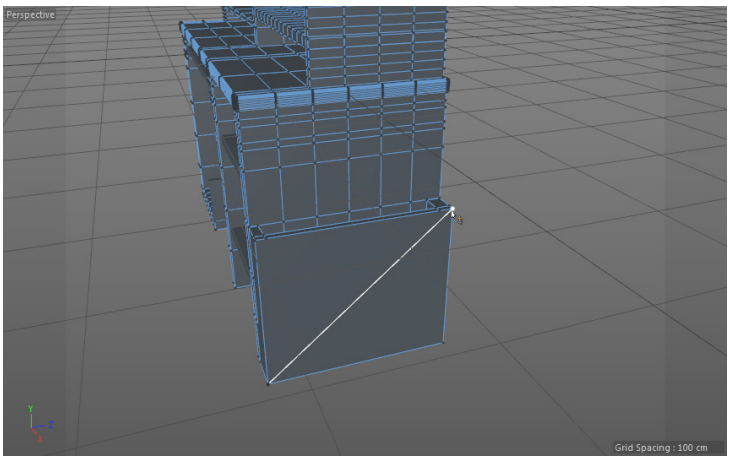

Figure 3-118 *The new edge created*

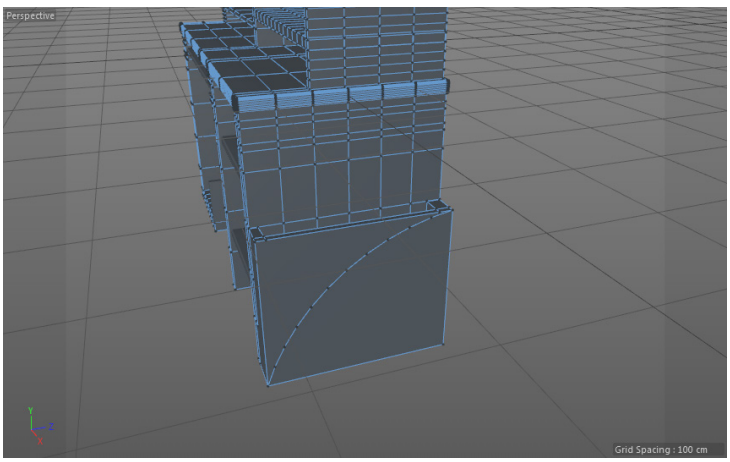

Figure 3-119 *The edge converted to an arc shape*

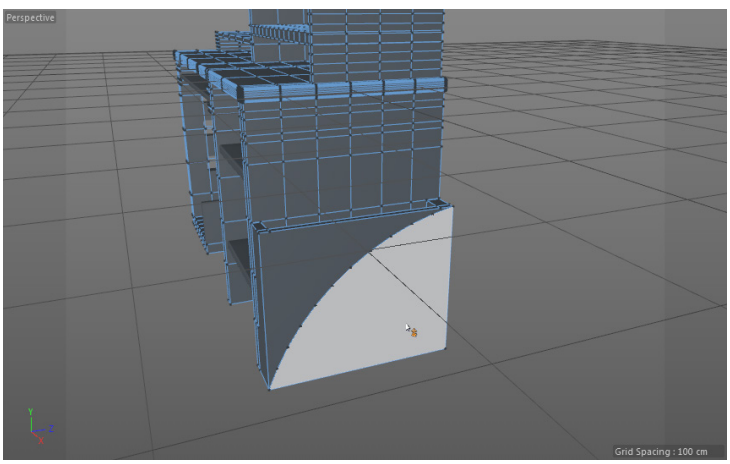

Figure 3-120 *Highlighted polygon*

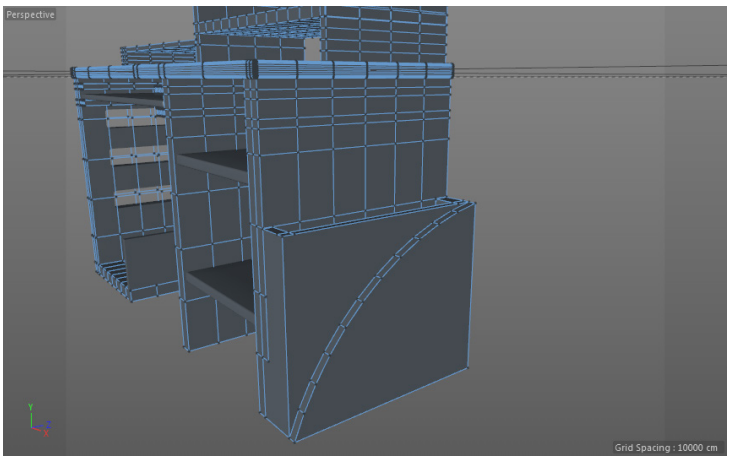

Figure 3-121 *The extruded polygon*



Figure 3-122 *Model of a vase*

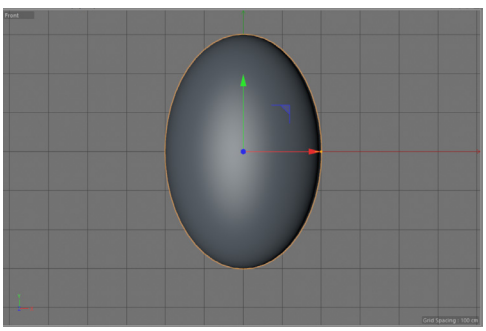

Figure 3-123 *vase displayed in the Front viewport*

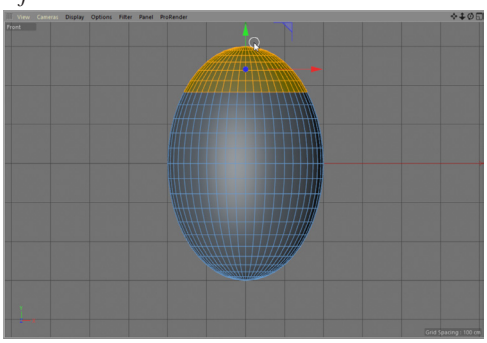

Figure 3-124 *Selected Polygons*

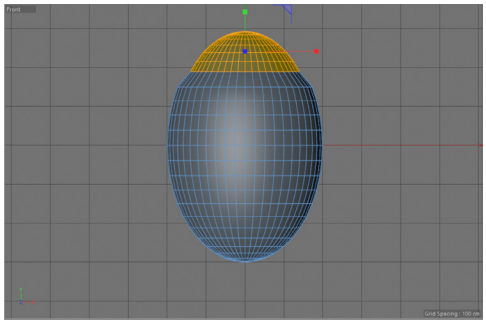

Figure 3-125 *Selected polygons scaled uniformly*

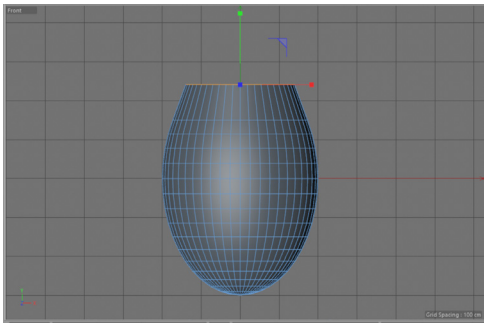

Figure 3-126 *Selected Polygons scaled in Y-axis*

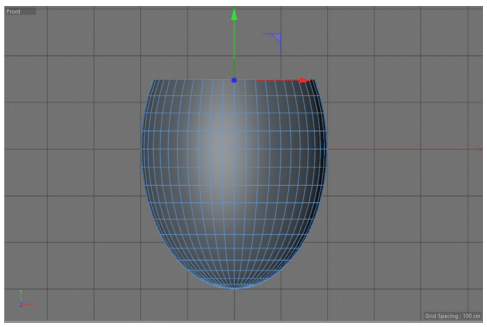

Figure 3-127 *Selected polygons moved downword*

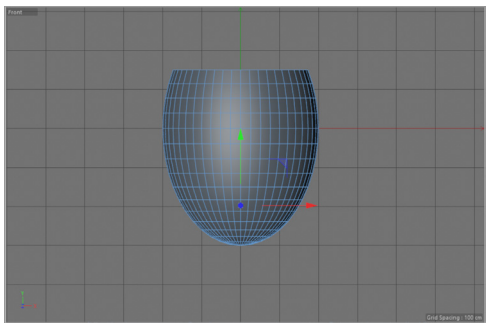

Figure 3-128 *Selected Polygons Extruded*

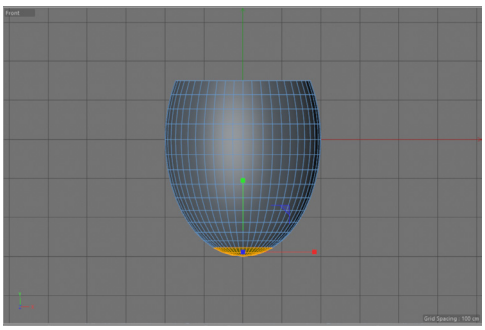

Figure 3-129 *Bottommost polygons selected*

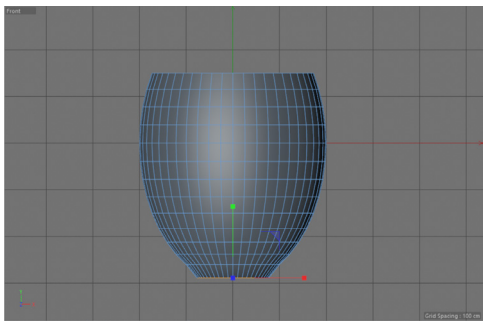

Figure 3-130 *Selected polygons scaled in y-axis*

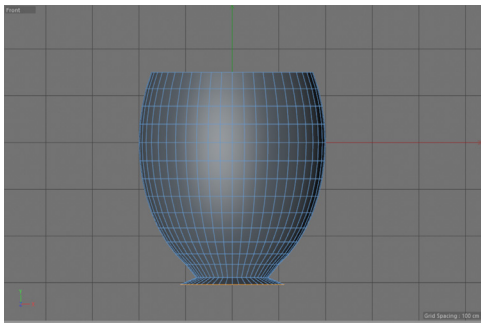

Figure 3-131 *Selected polygons beveled*

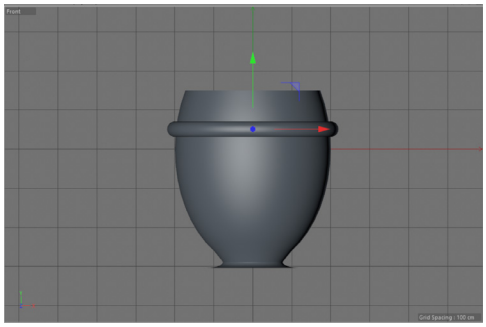

Figure 3-132 *Torus moved upwards*

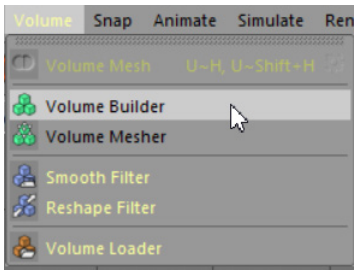

Figure 3-133 *Choosing* ***Volume Builder*** *from the* ***Volume*** *menu*

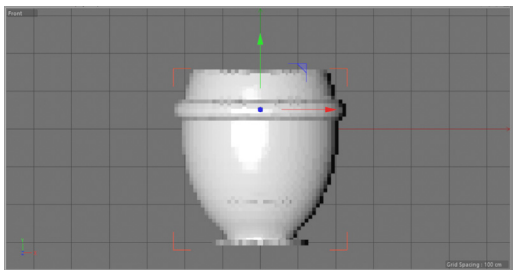

Figure 3-134 *Voxel objects displayed*

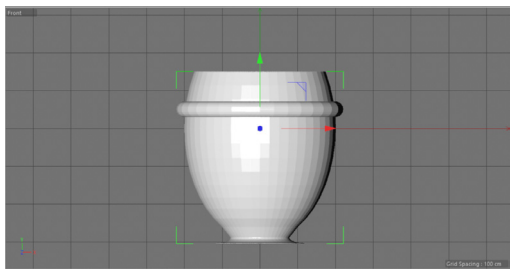

Figure 3-135 *Voxel objects smoothened*

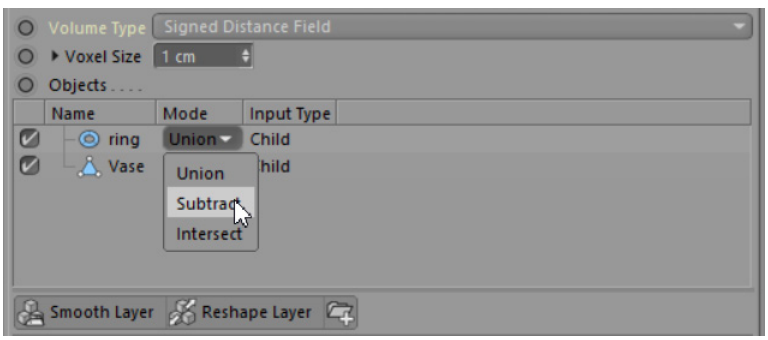

Figure 3-136 *Choosing* ***Subtract*** *from the* ***Mode*** *drop-down list*

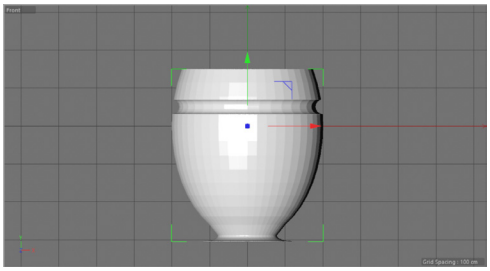

Figure 3-137 *Groove created on vase*

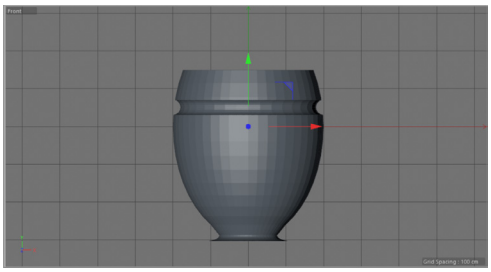

Figure 3-138 *vase turns dark grey*

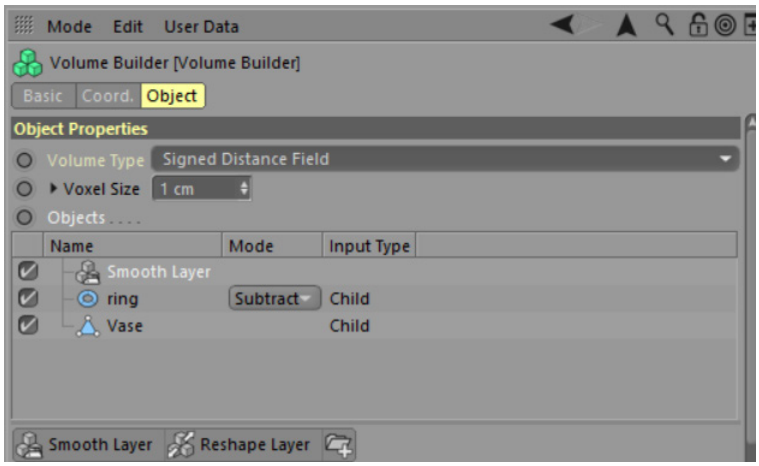

Figure 3-139 ***Smooth Layer*** *added to the* ***Objects*** *area*

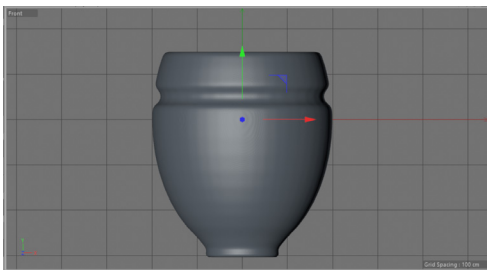

Figure 3-140 *vase smoothened*

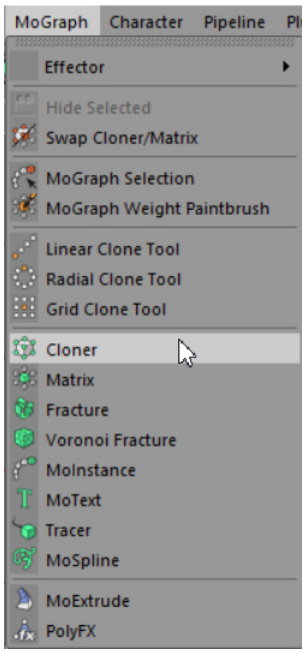

Figure 3-141 *Choosing* ***Cloner*** *from the* ***MoGraph*** *menu*

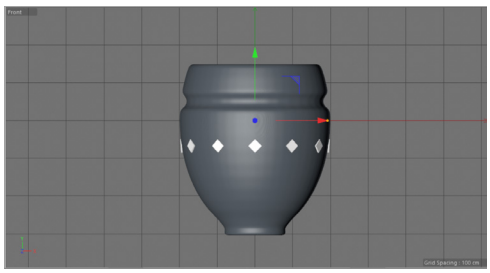

Figure 3-142 *Cloner placed on vase*

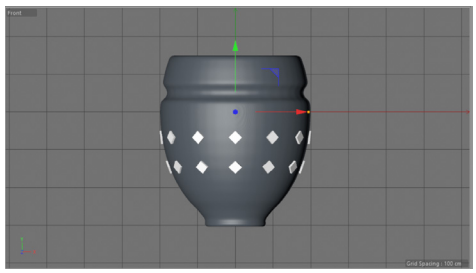

Figure 3-143 *Cloner.1 placed on vase*

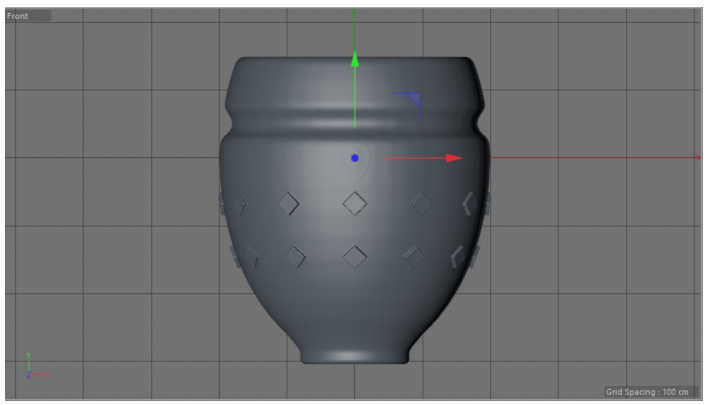

Figure 3-144 *vase displayed in the viewport*

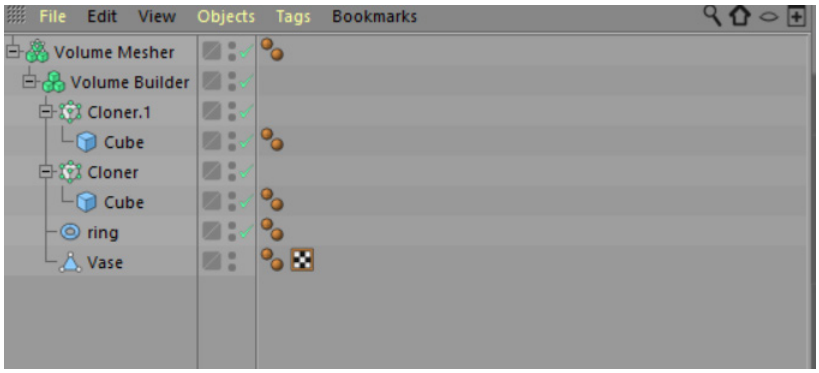

Figure 3-145 *List of all the objects in the Object Manager*



Figure 3-146 *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*

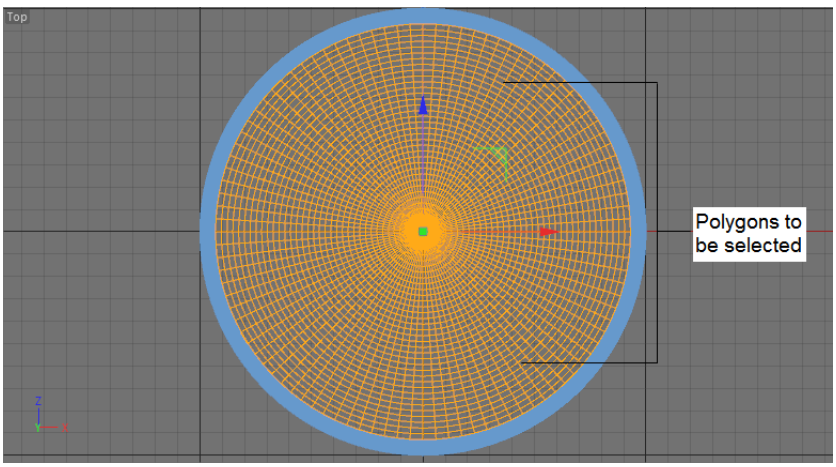

Figure 4-2 *The polygons to be selected*

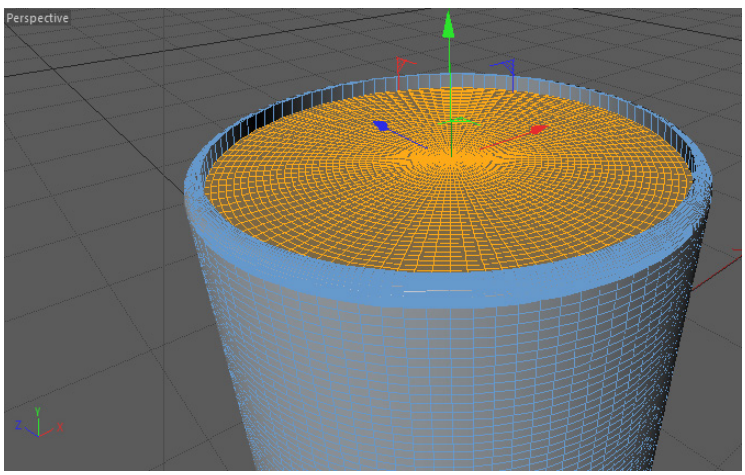

Figure 4-3 *Moving the polygons of the Candle downward*

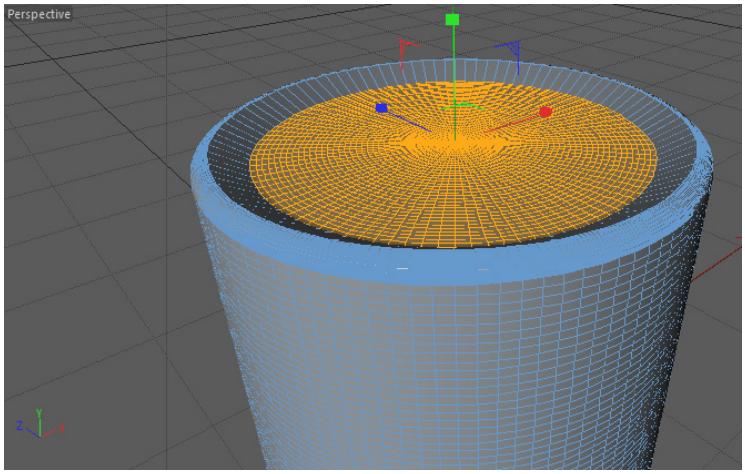

Figure 4-4 *Scaling down the polygons of Candle*

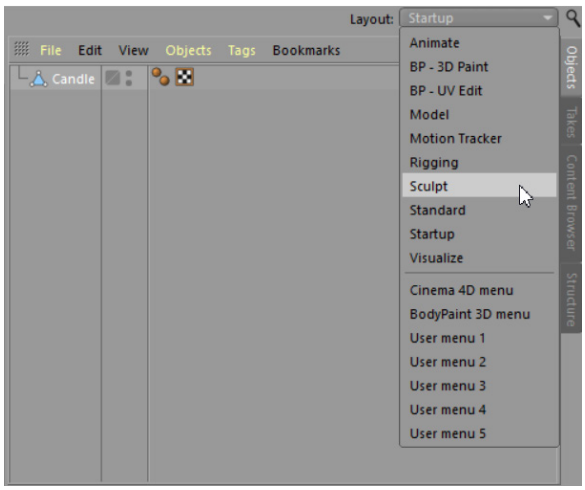

Figure 4-5 *Selecting* ***Sculpt*** *from the* ***Layout*** *drop-down list*

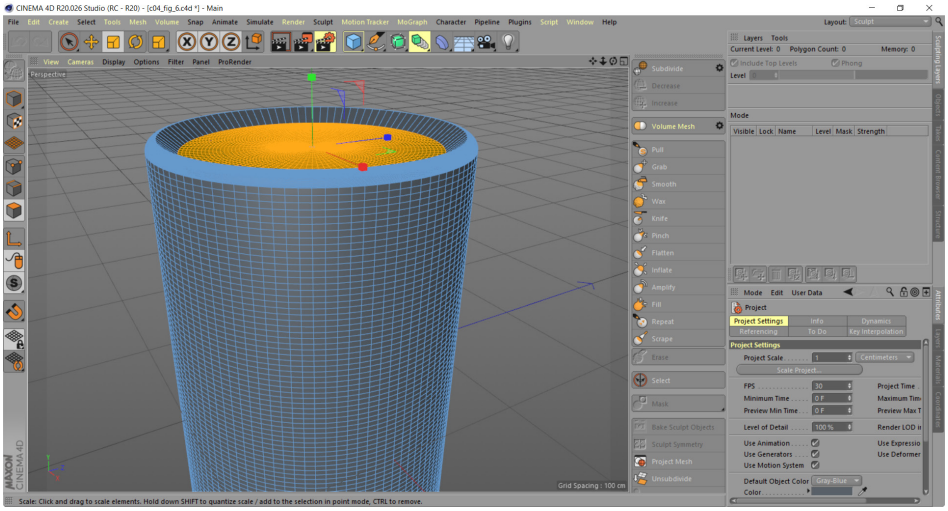

Figure 4-6 *The* ***Sculpt*** *layout*

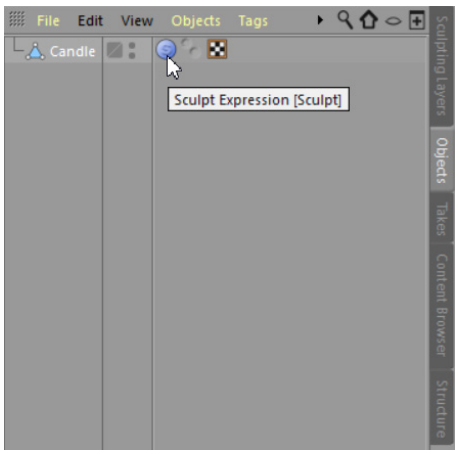

Figure 4-7 *The* ***Sculpt Expression [Sculpt]*** *tag added to the Object Manager*

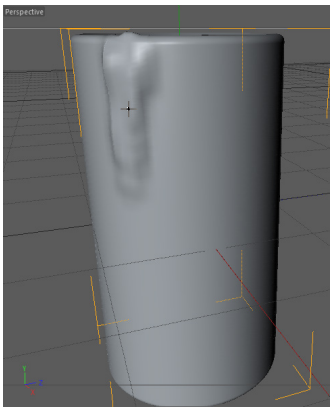

Figure 4-8 *The strokes added*

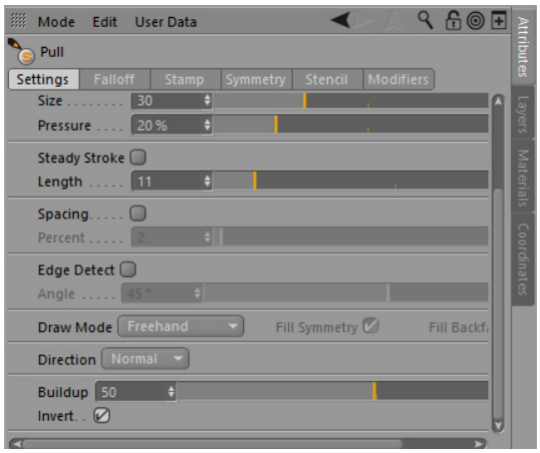

Figure 4-9 *The* ***Invert*** *check box selected in the* ***Settings*** *area in the Attribute Manager*

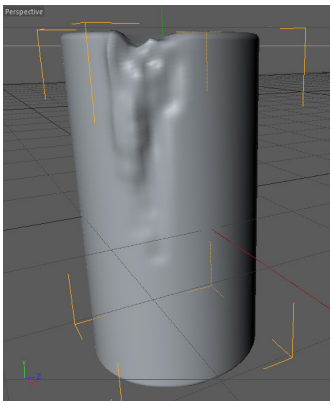

Figure 4-10 *Strokes added to the Candle*

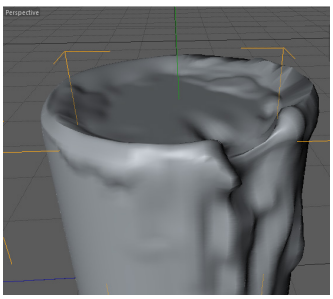

Figure 4-11 *Strokes added on the top of Candle*

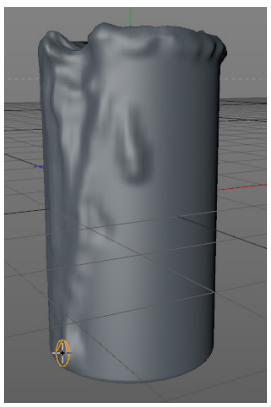

Figure 4-12 *Adding strokes to the bottom of the Candle*

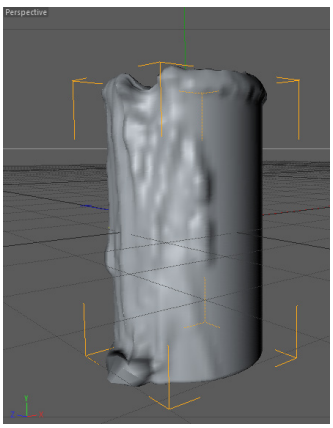

Figure 4-13 *More strokes added to the bottom of the Candle*

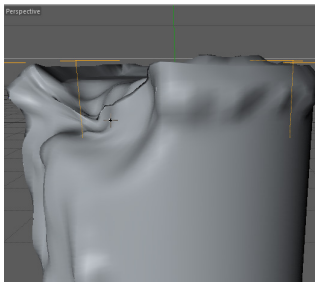

Figure 4-14 *Adding strokes to the top of Candle*

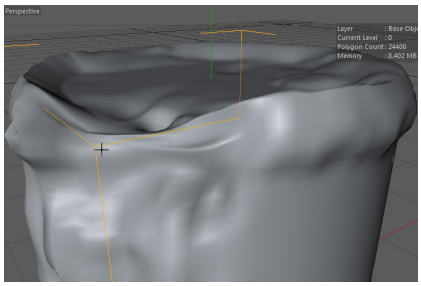

Figure 4-15 *The smoothened surface of Candle*

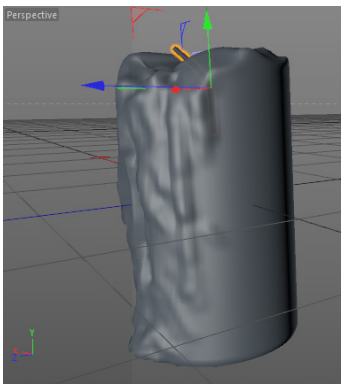

Figure 4-16 *The Wick of the Candle*

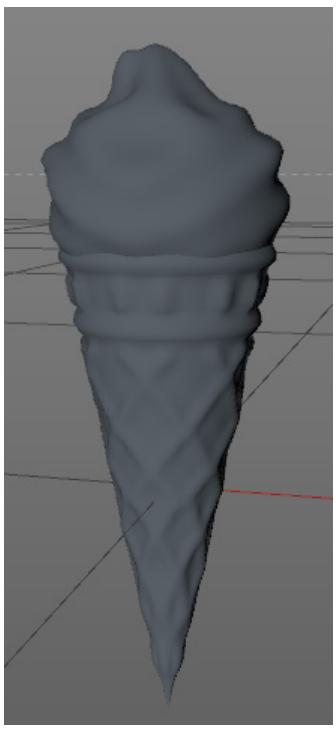

Figure 4-17 *The ice cream cone*

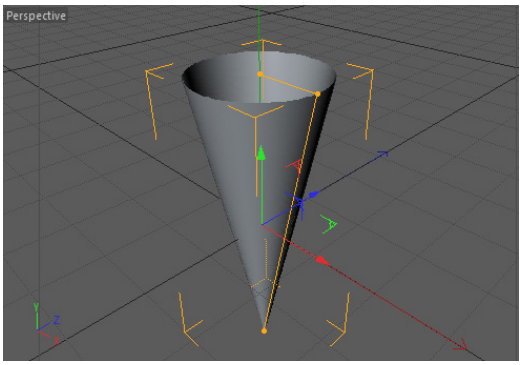

Figure 4-18 *The Cone displayed in the Perspective viewport*

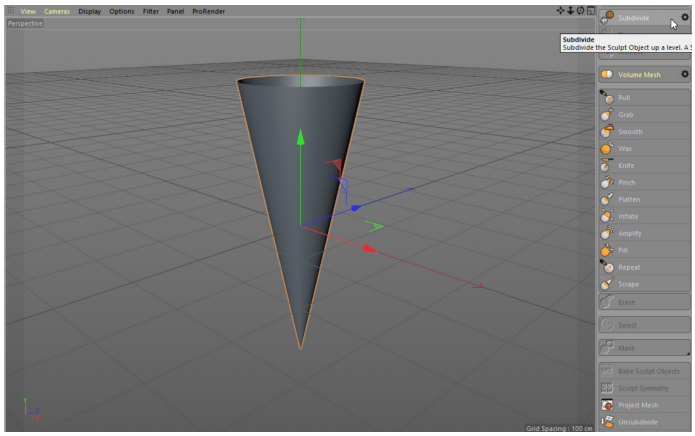

Figure 4-19 *Choosing the* ***Subdivide*** *tool from the* ***Sculpting*** *menu*

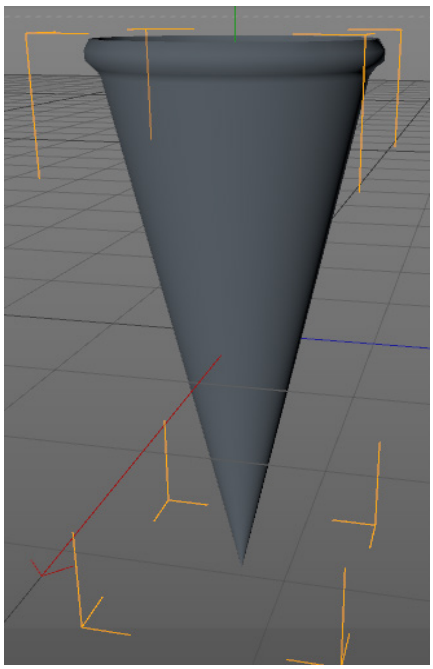

Figure 4-20 *Applying strokes on the top of the Cone*

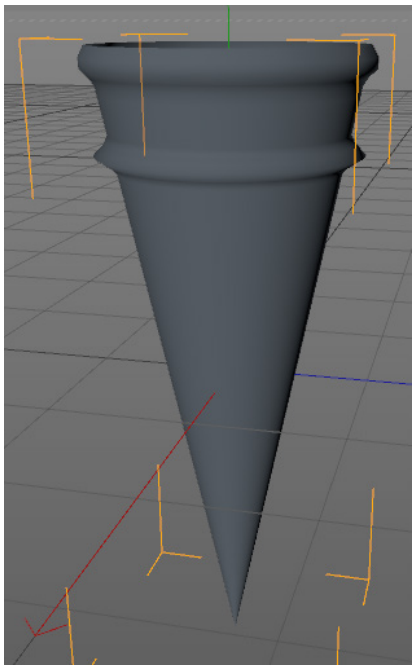

Figure 4-21 *The strokes added*

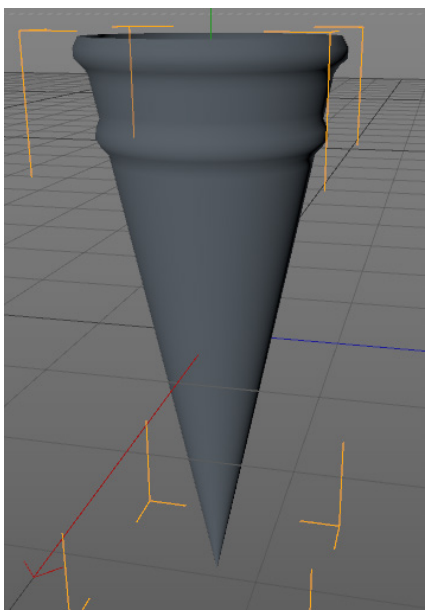

Figure 4-22 *Cone smoothened using the* ***Smooth*** *tool*

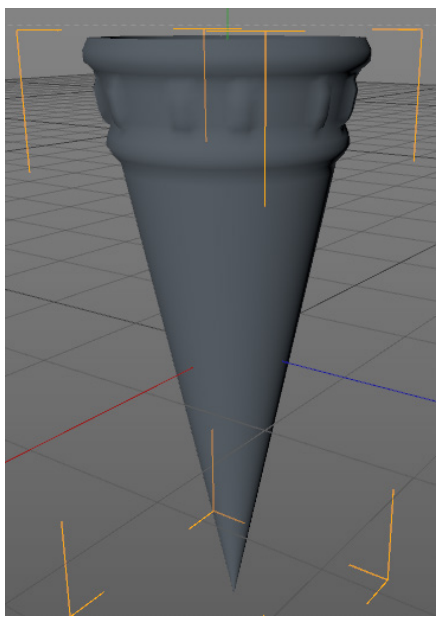

Figure 4-23 *Creating a pattern on Cone in the Perspective viewport*

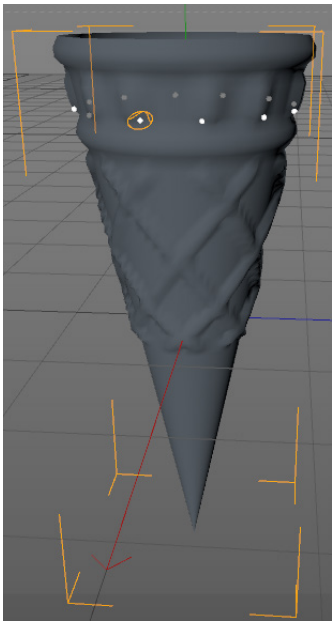

Figure 4-24 *Creating a pattern on Cone using the* ***Inflate*** *tool*

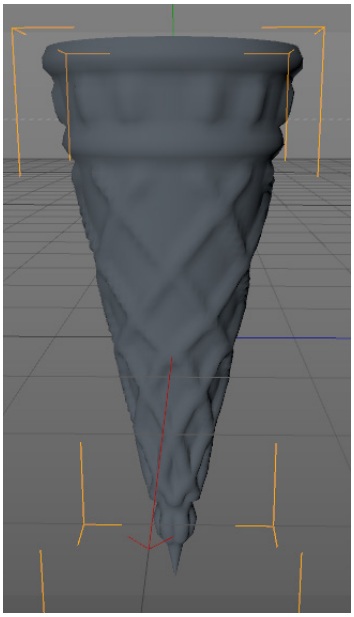

Figure 4-25 *The pattern displayed on Cone*

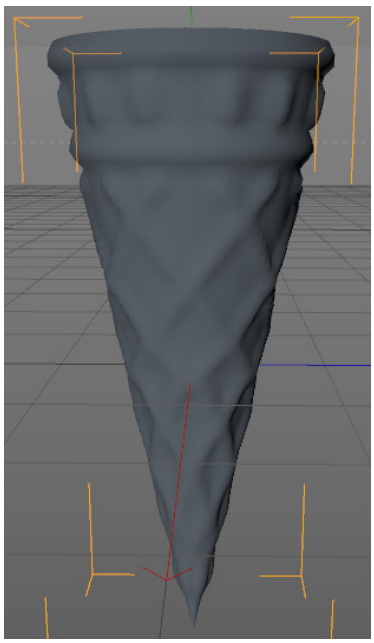

Figure 4-26 *Smoothening the surface of Cone using the* ***Smooth*** *tool*

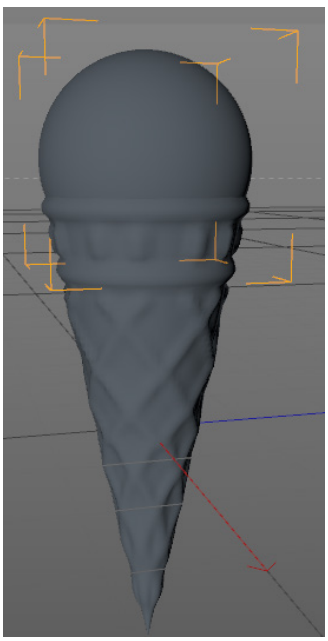

Figure 4-27 *The Scoop displayed in the Perspective viewport*

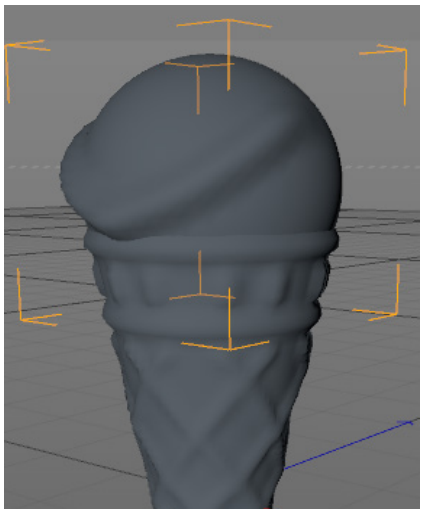

Figure 4-28 *Adding strokes on the Scoop in the Perspective viewport*

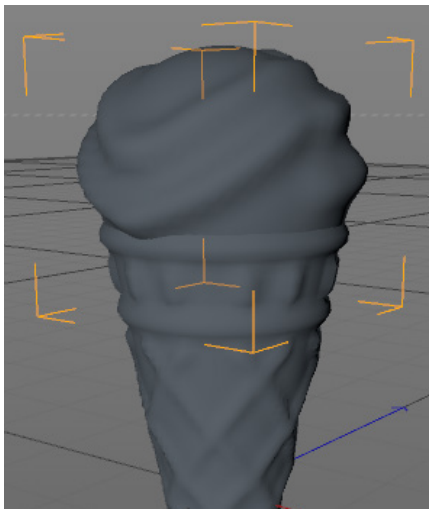

Figure 4-29 *Adding stroke on Scoop using the* ***Pull*** *tool*

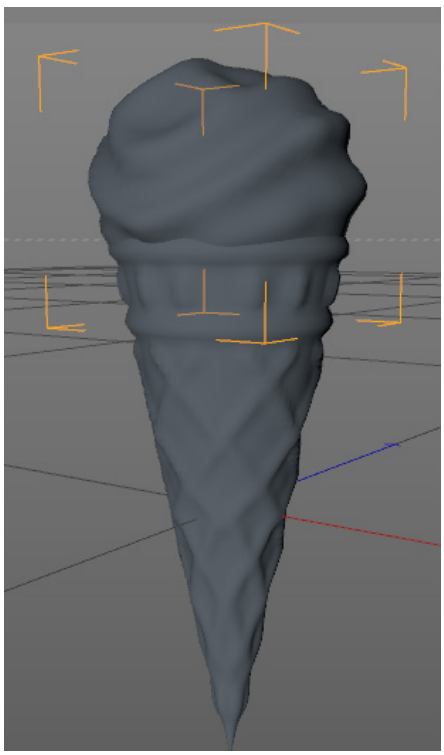

Figure 4-30 *Creating the pattern on Scoop in the Perspective viewport*



Figure 4-31 *The peak of Scoop created*

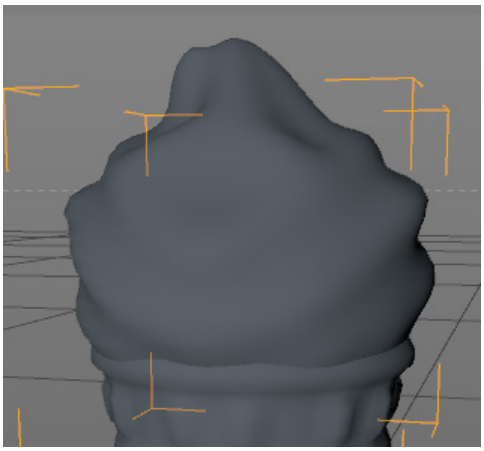

Figure 4-32 *The smooth peak of the Scoop in the Perspective viewport*



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*

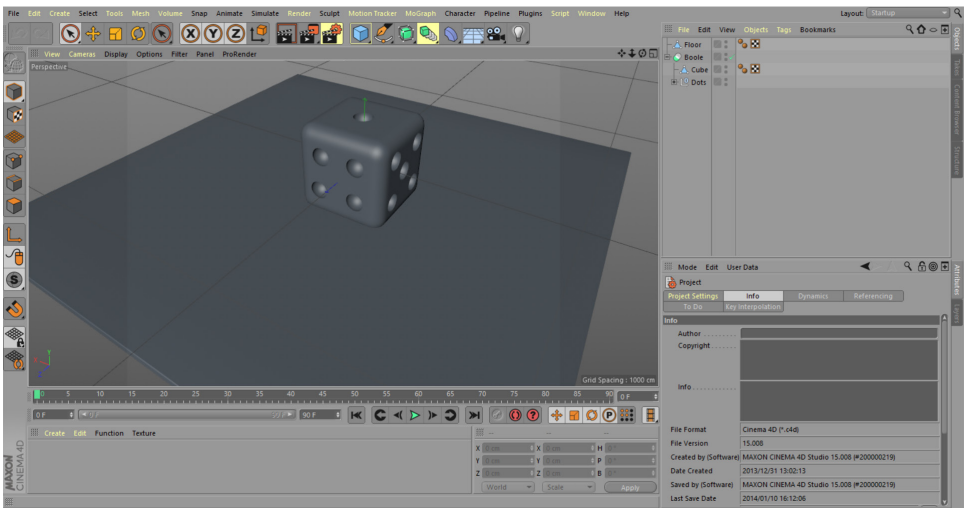

Figure 5-2 *The c05_tut1_start.c4d file*

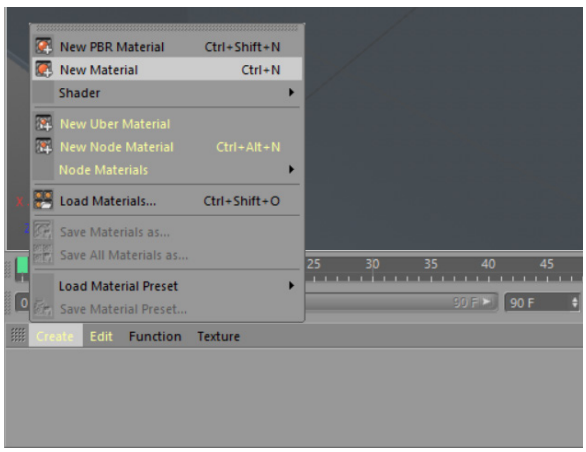

Figure 5-3 *Choosing* ***New Material*** *from the Material Manager menu*

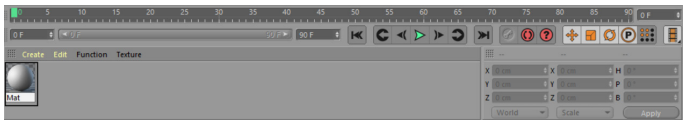

Figure 5-4 *Displaying the material slot in the Material Manager*

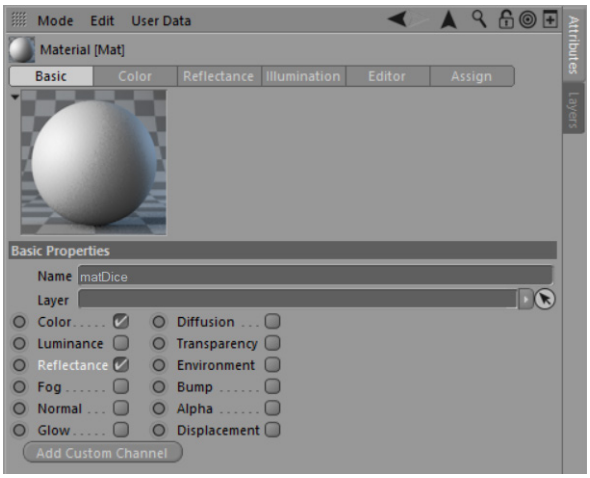

Figure 5-5 *The* ***Reflectance*** *check box selected*

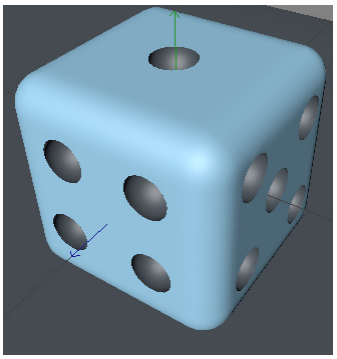

Figure 5-6 *The matDice material applied to Cube*

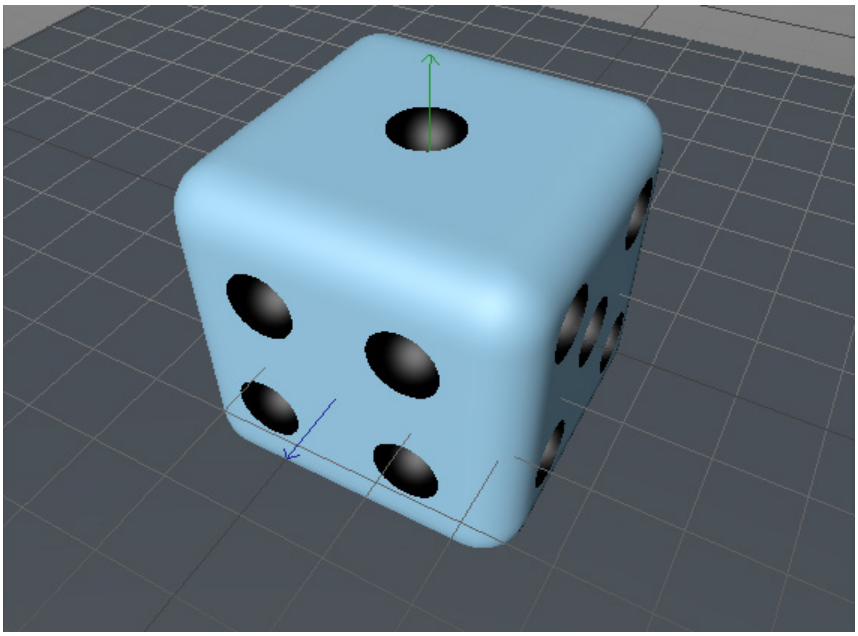

Figure 5-7 *The Dot material applied to dots of the Cube*

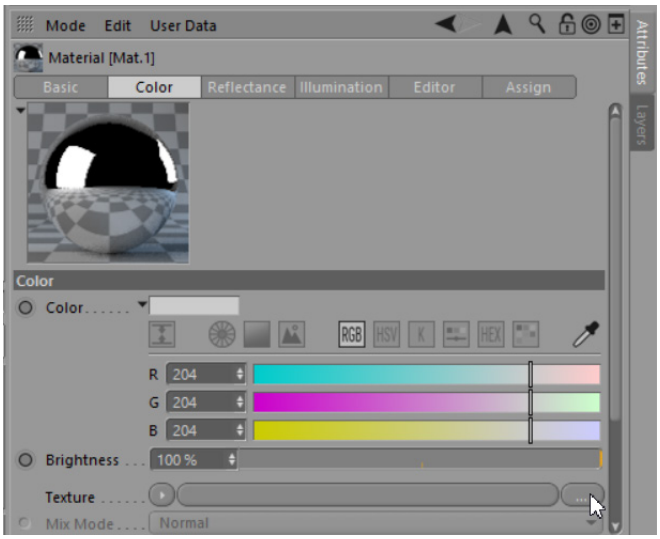

Figure 5-8 *Choosing the browse button*

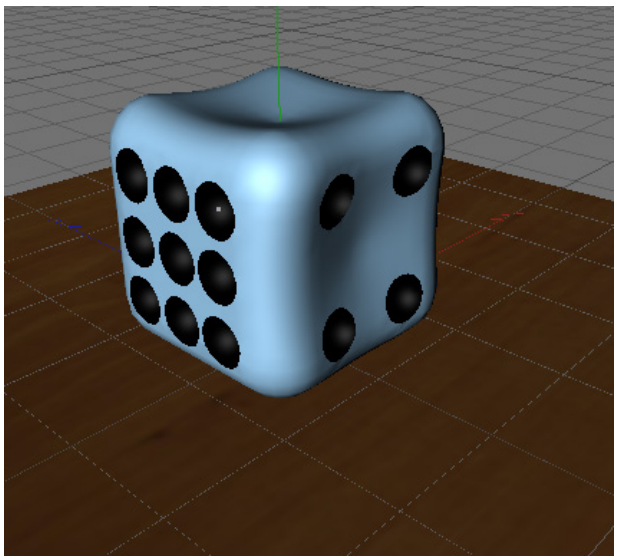

Figure 5-9 *The matFloor applied to Floor*

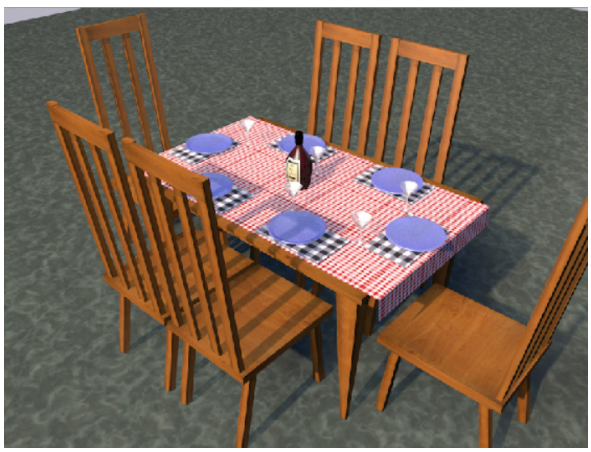

Figure 5-10 *The textured dining table set*

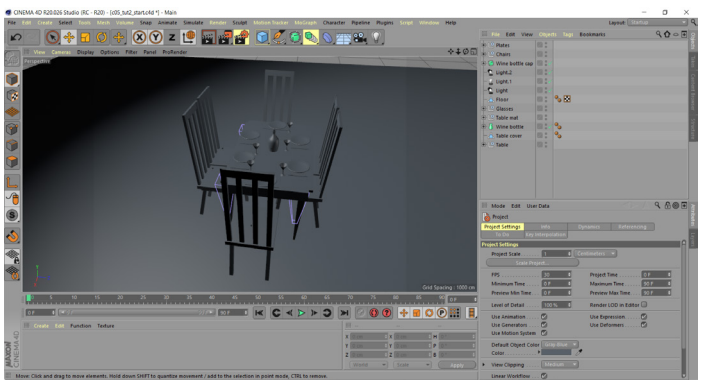

Figure 5-11 *The c05_tut2_start.c4d file*

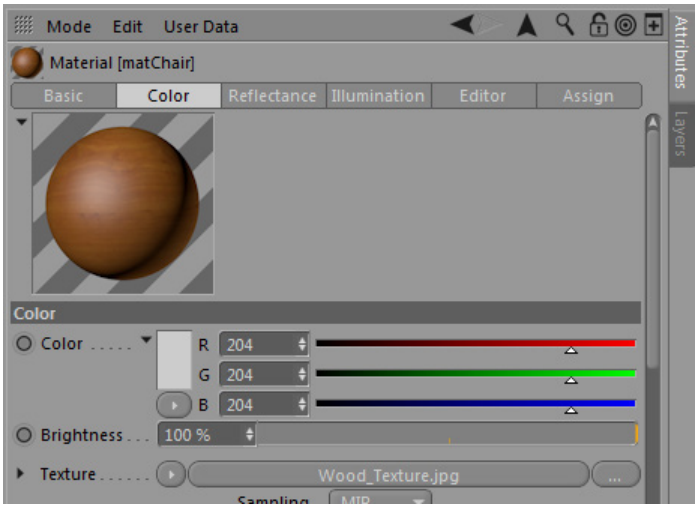

Figure 5-12 *The Wood_Texture.jpg added to the* ***Color*** *area of Attribute Manager*

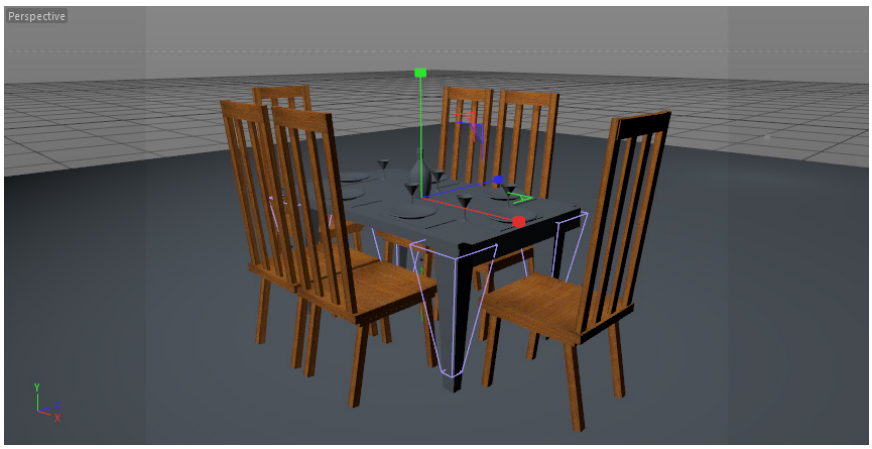

Figure 5-13 *The matChair applied to the chairs*

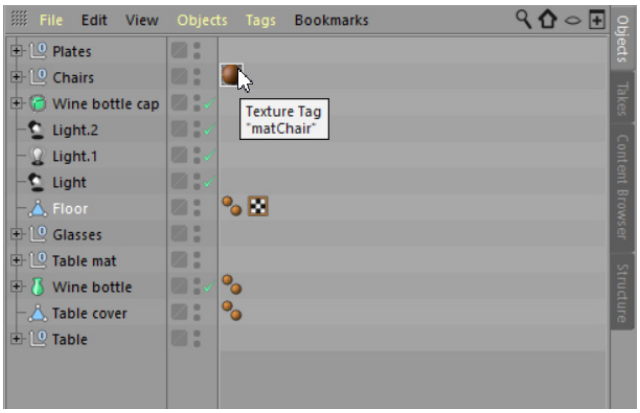

Figure 5-14 *The* ***Texture Tag "matChair"*** *in the Object Manager*

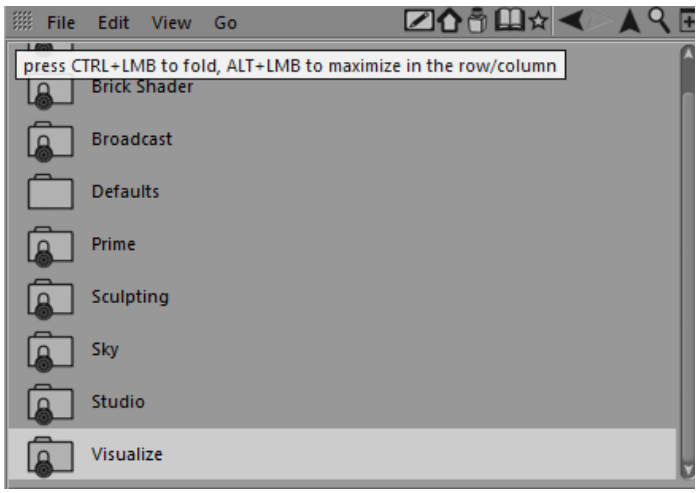

Figure 5-15 *Choosing the* ***Visualize*** *folder in the Content Browser*

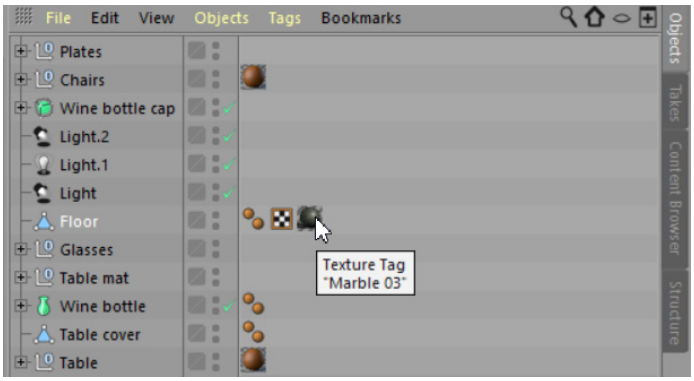

Figure 5-16 *The* ***Texture Tag "Marble 03"*** *selected in the Object Manager*

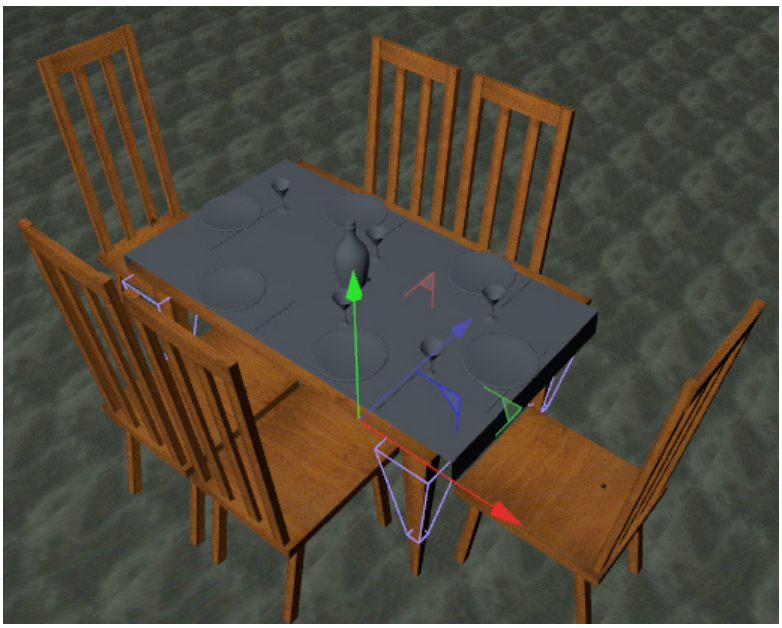

Figure 5-17 *The Marble 03 texture uniformly projected on the Floor*

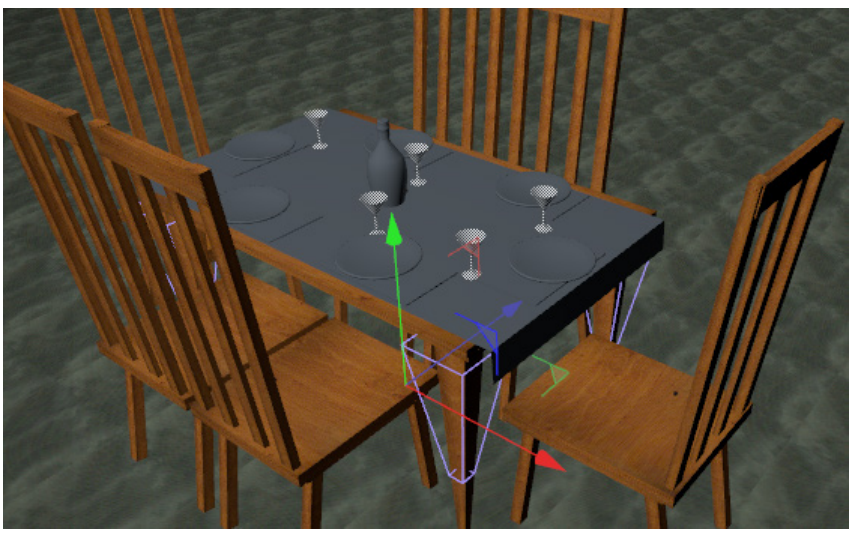

Figure 5-18 *The matGlass material applied to the Glasses*

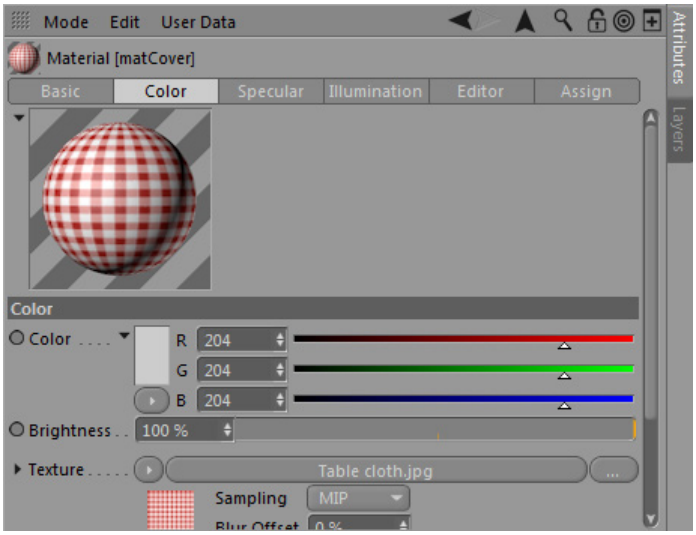

Figure 5-19 *The matCover material applied to the material slot*

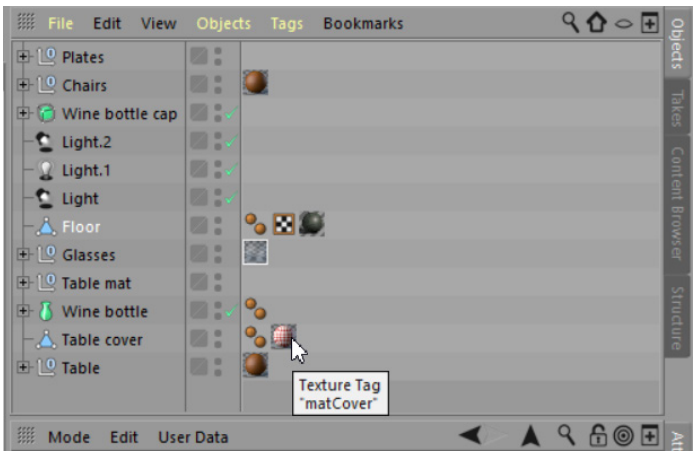

Figure 5-20 *The* ***Texture Tag "matCover"*** *selected in the Object Manager*

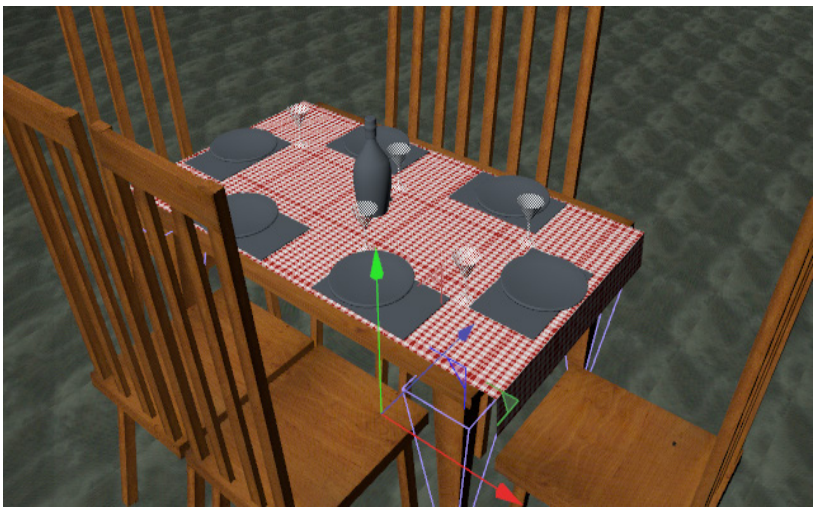

Figure 5-21 *The matCover material applied to Table cover*

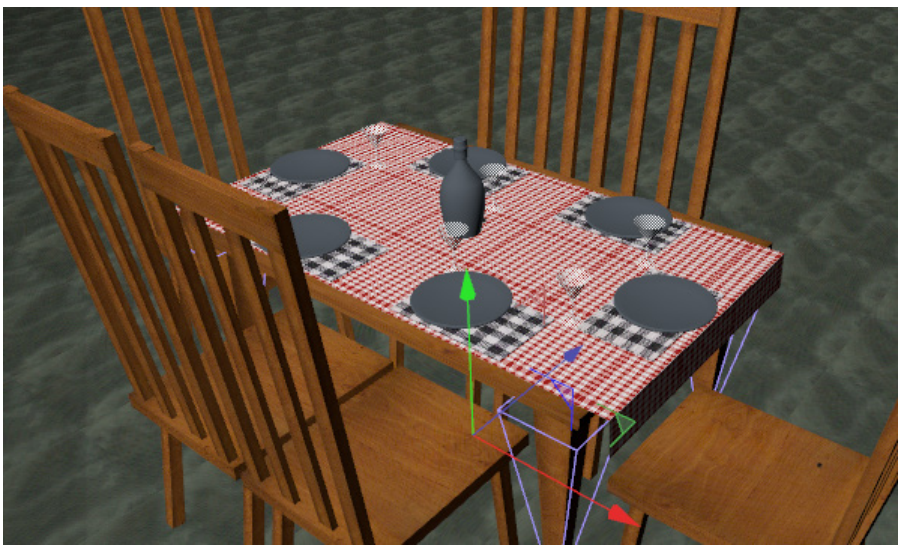

Figure 5-22 *The matTableMats material applied to the Table mat group*

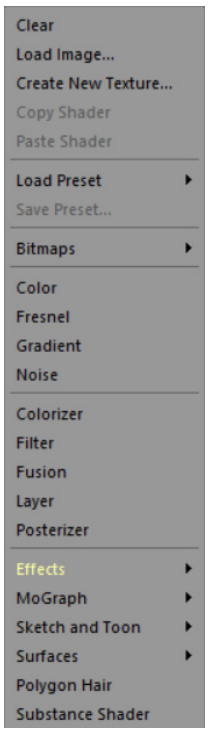

Figure 5-23 *The flyout displayed on choosing the triangle button next to the* ***Texture*** *parameter*

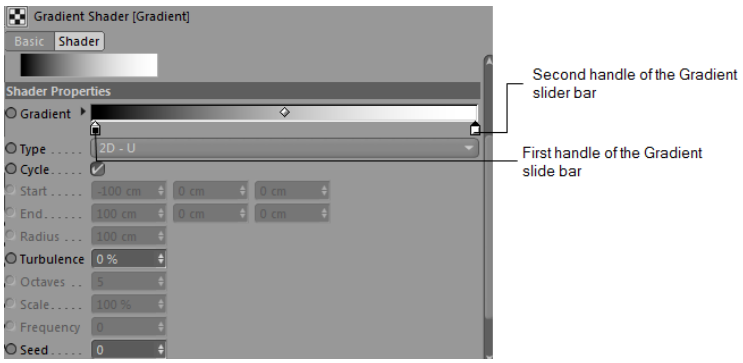

Figure 5-24 *The* ***Shader Properties*** *area of* ***Gradient*** *in the Attribute Manager*

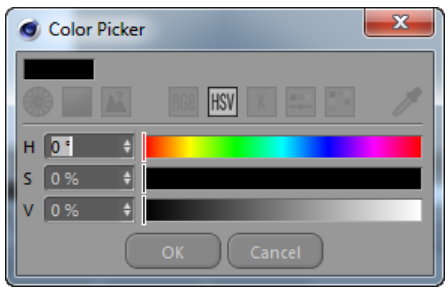

Figure 5-25 *The* ***Color Picker*** *dialog box*



Figure 5-26 *The matWine material applied to Wine bottle*

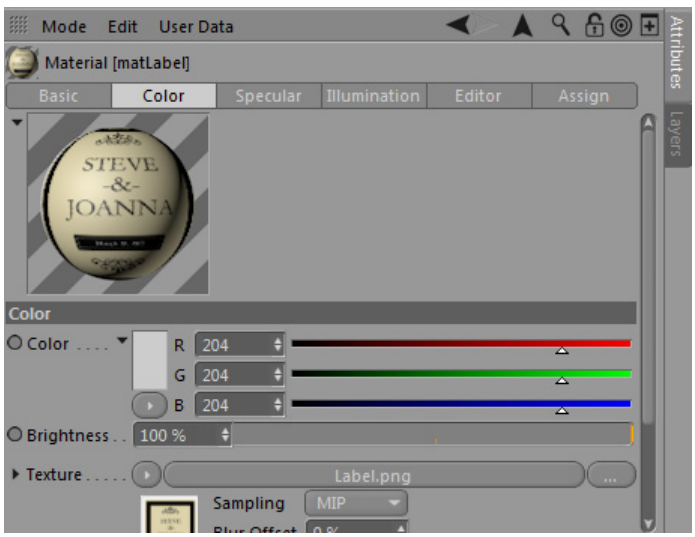

Figure 5-27 *The matLabel texture displayed in the* ***Color*** *area of Material Manager*

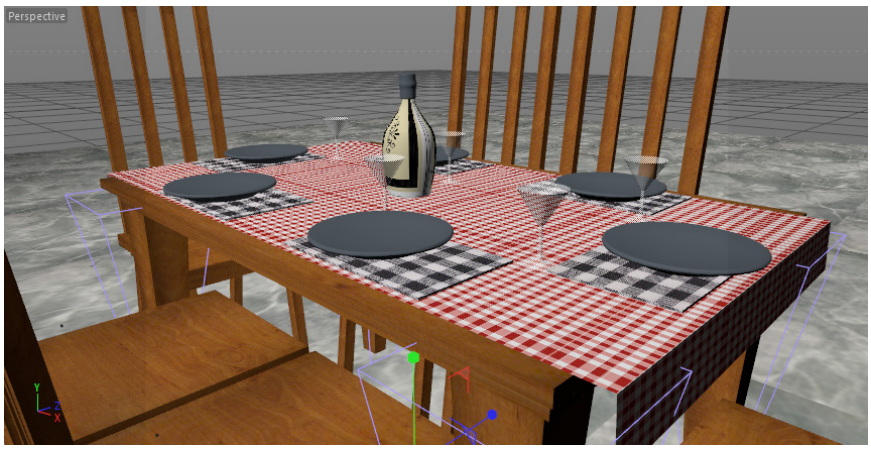

Figure 5-28 *The matLabel texture applied to Wine bottle*

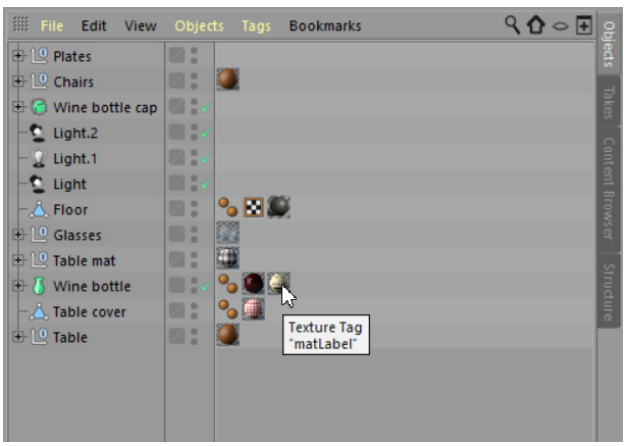

Figure 5-29 *Selecting the* ***Texture Tag*** *"****matLabel****" in the Object Manager*



Figure 5-30 *The matLabel material projected properly on the wine bottle in the Perspective viewport*



Figure 5-31 *The matCap material applied to the Wine bottle cap*

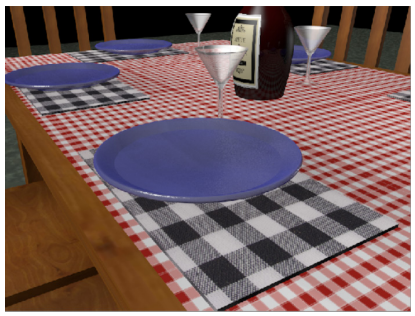

Figure 5-32 *The matplate material applied to the plates*



Figure 5-33 *The exterior scene with the materials applied*

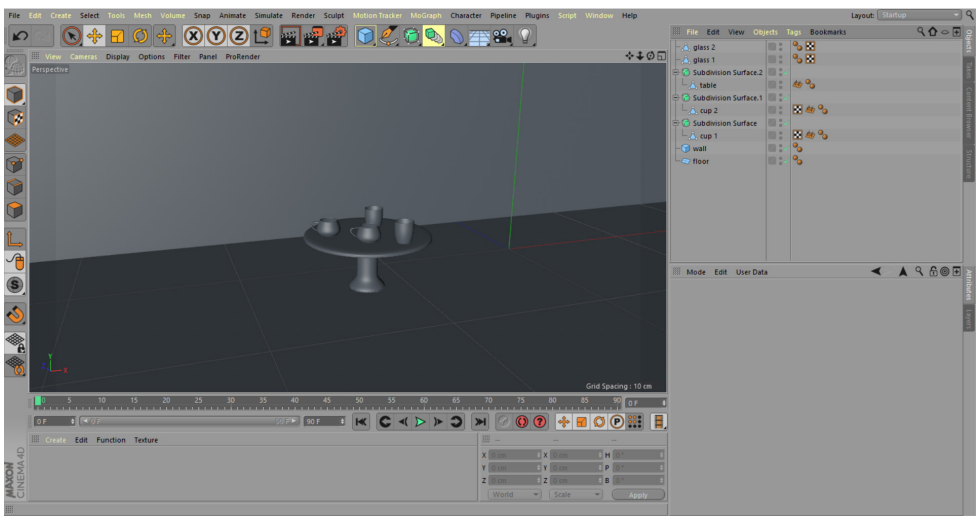

Figure 5-34 *The c05_tut3_start.c4d file*

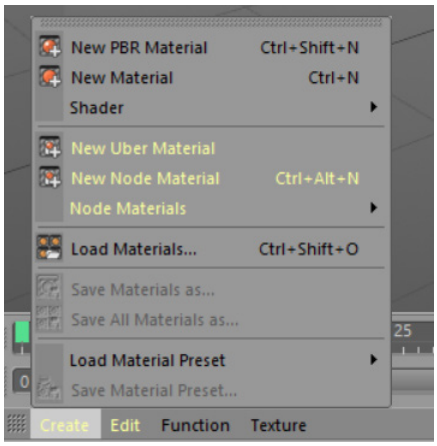

Figure 5-35 *Choosing* ***New Node Material*** *from the* ***Create*** *menu*

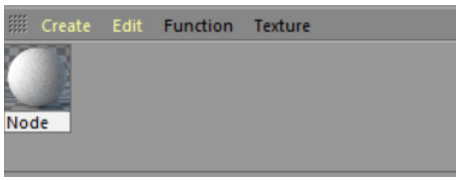

Figure 5-36 *New node material created in the Material Manager*

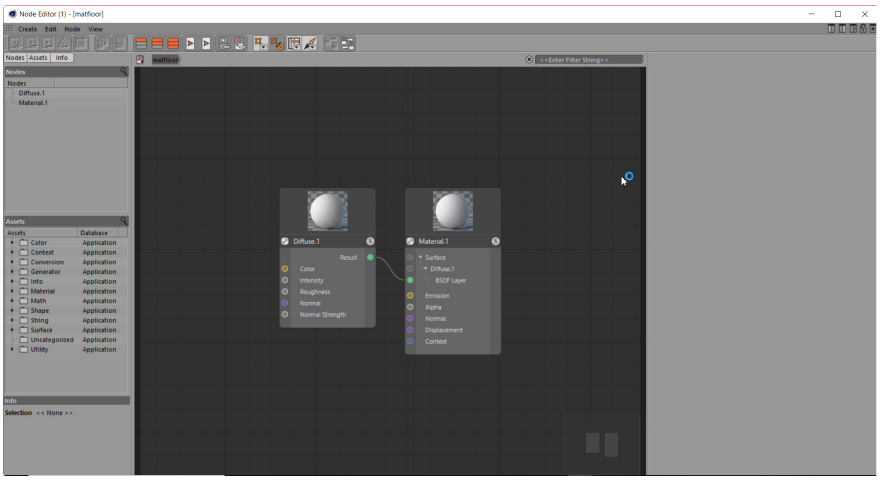

Figure 5-37 *The* ***Node Editor (1) [matfloor]*** *window*

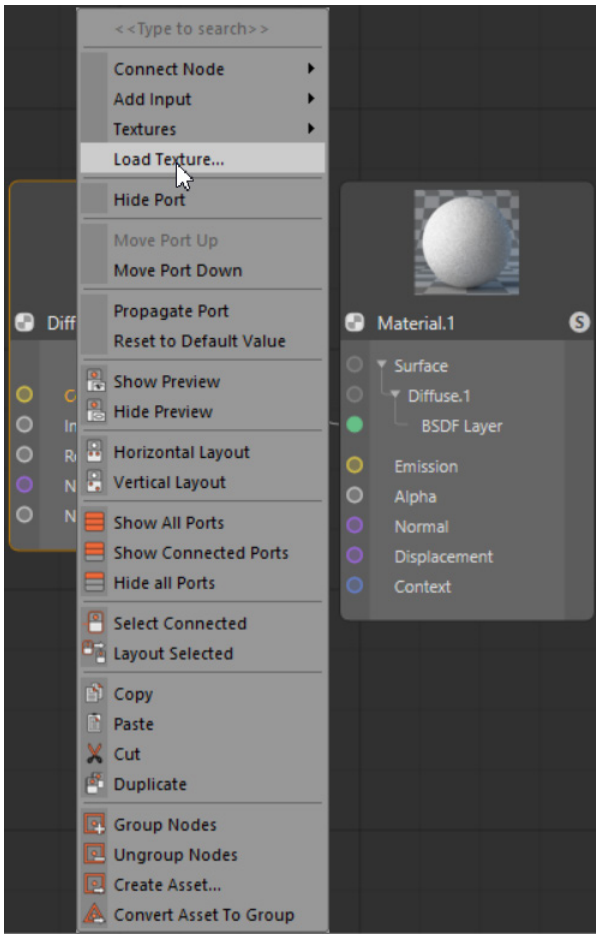

Figure 5-38 *Choosing* ***Load Texture*** *from the shortcut menu*

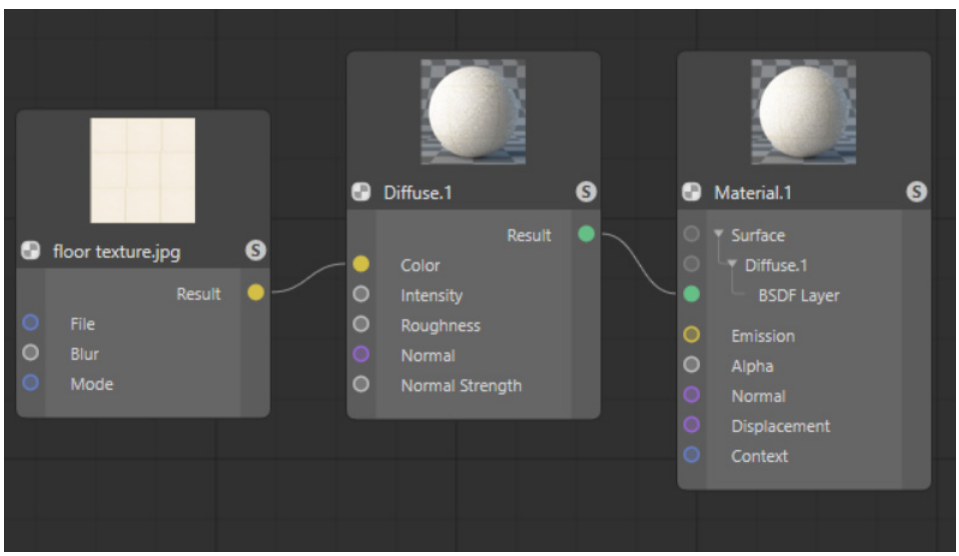

Figure 5-39 *The* ***floor texture.jpg*** *node added to the* ***Color*** *input of the* ***Diffuse.1*** *node*

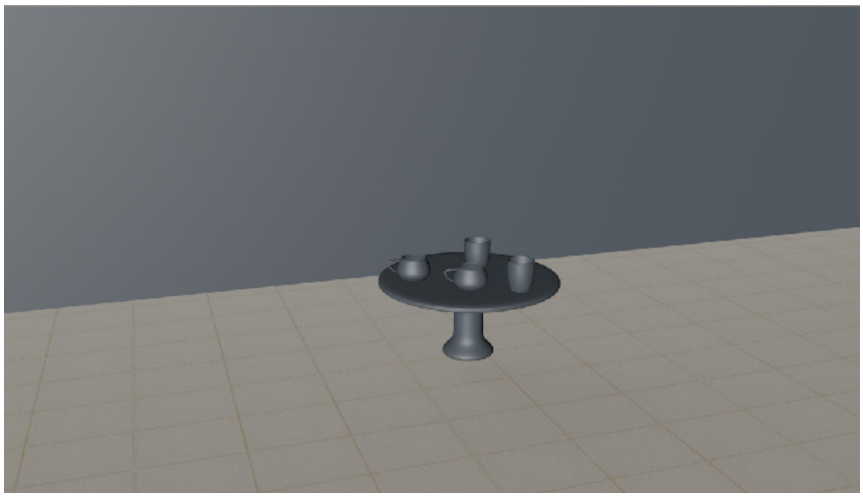

Figure 5-40 *The floor material displayed*

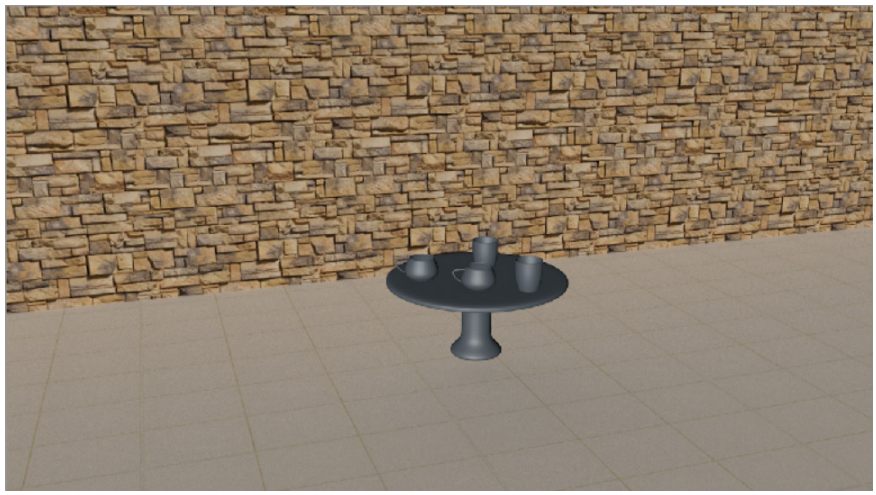

Figure 5-41 *The wall material displayed*

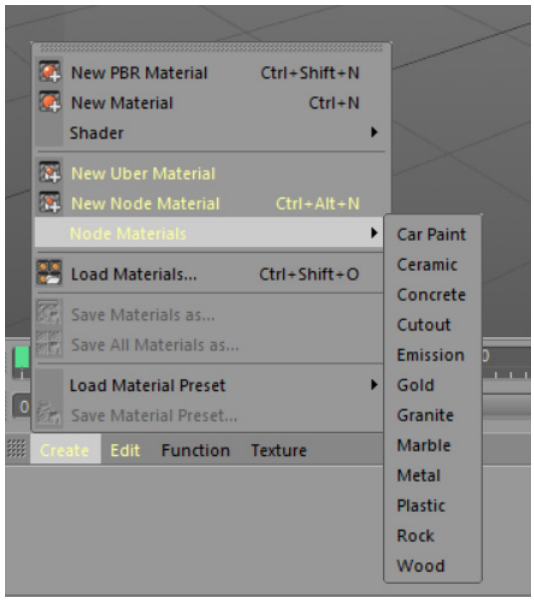

Figure 5-42 *The cascading menu displayed*



Figure 5-43 *The mattable material displayed*

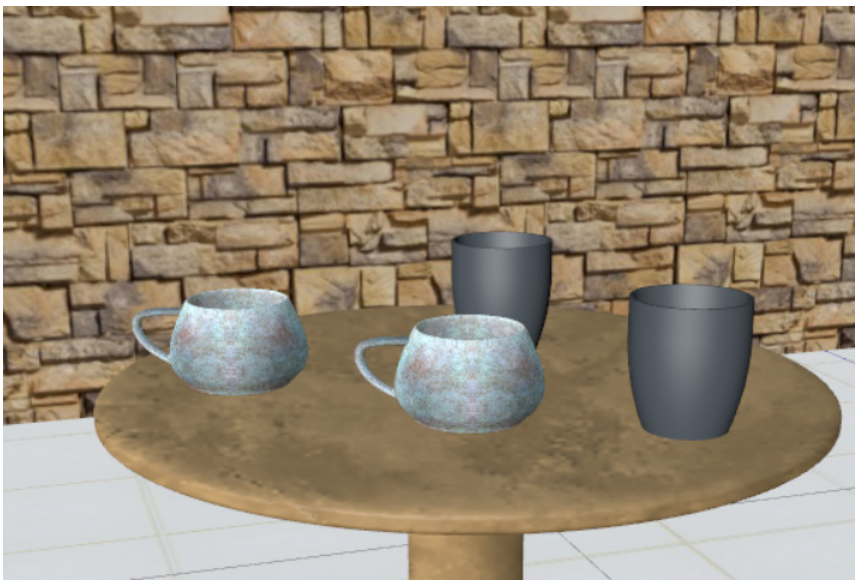

Figure 5-44 *The matcup material displayed*



Figure 5-45 *The matglass material displayed*

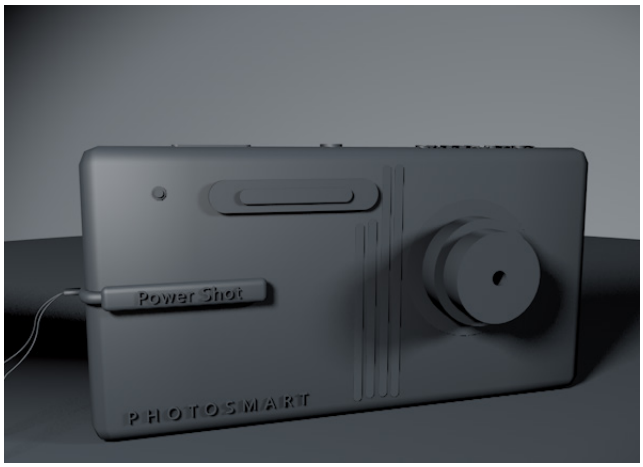

Figure 5-46 *The camera model*



Figure 5-47 *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*

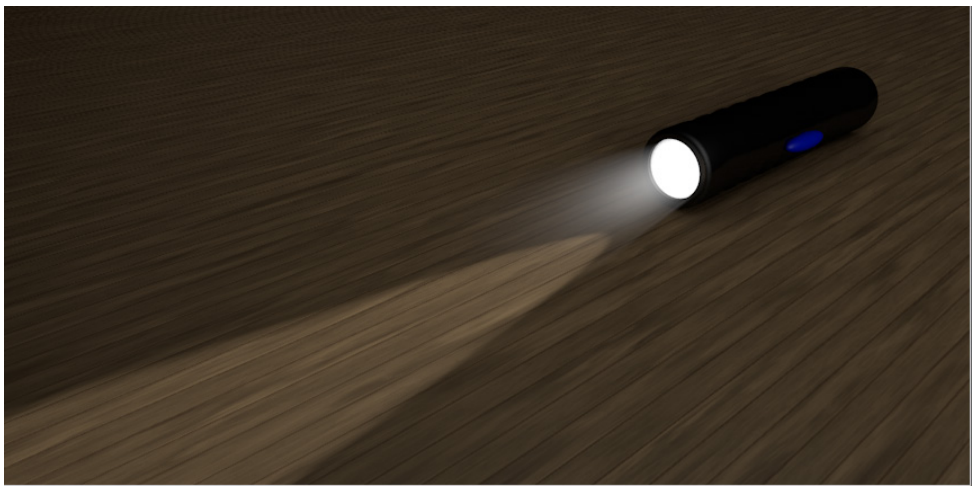

Figure 6-1 *The torchlight*

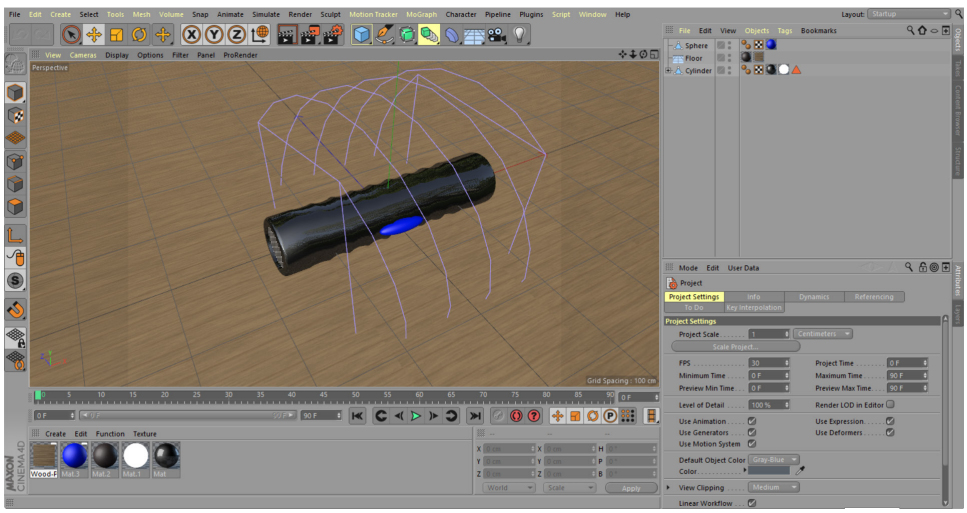

Figure 6-2 *The c06_tut1_start.c4d file*

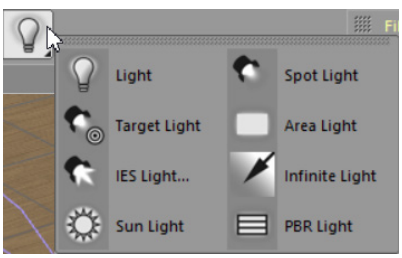

Figure 6-3 *The flyout displayed with various tools*

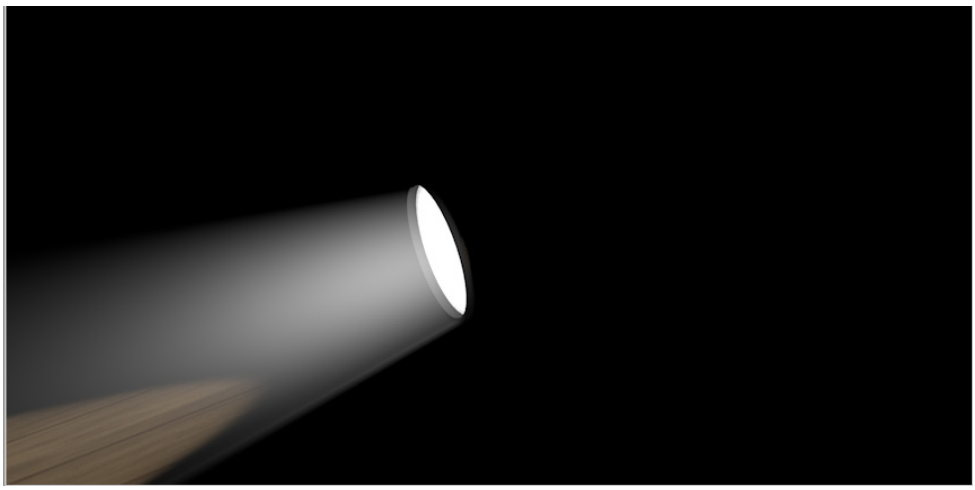

Figure 6-4 *The rendered view of the Perspective viewport*

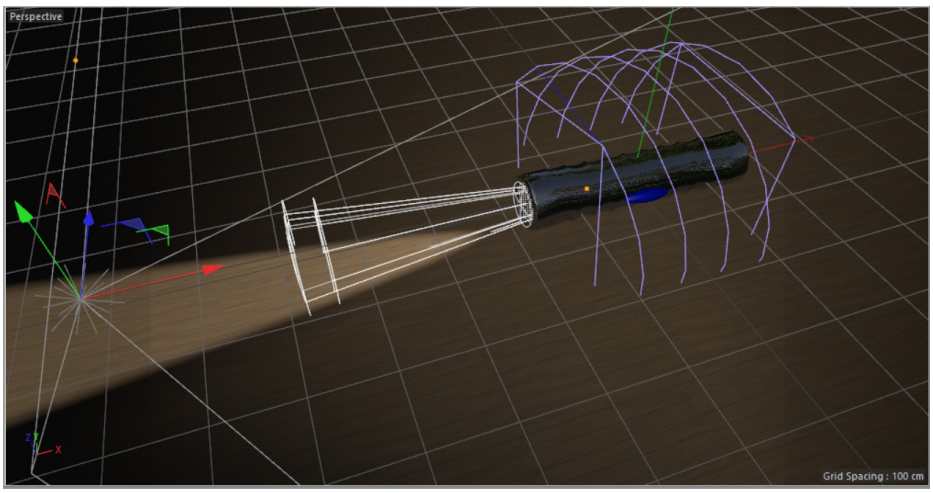

Figure 6-5 *Light.1 displayed in the Perspective viewport*

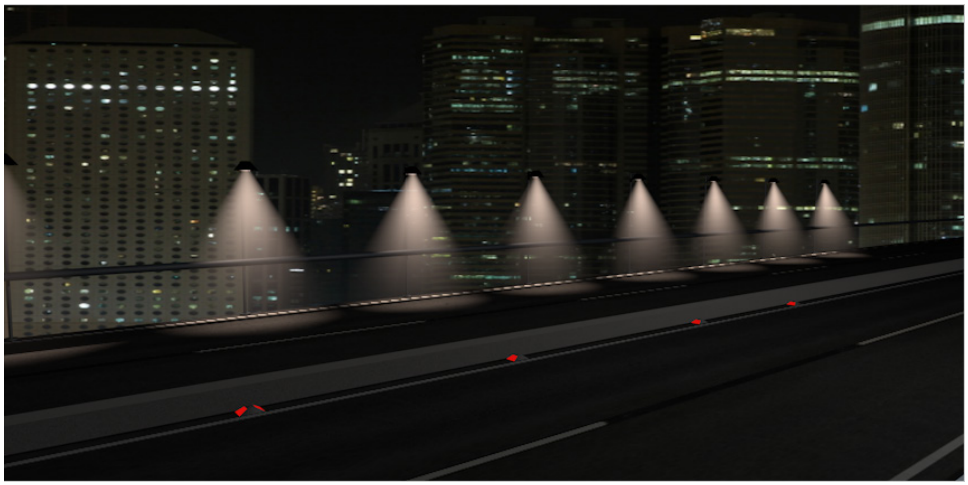

Figure 6-6 *The illuminated night scene*

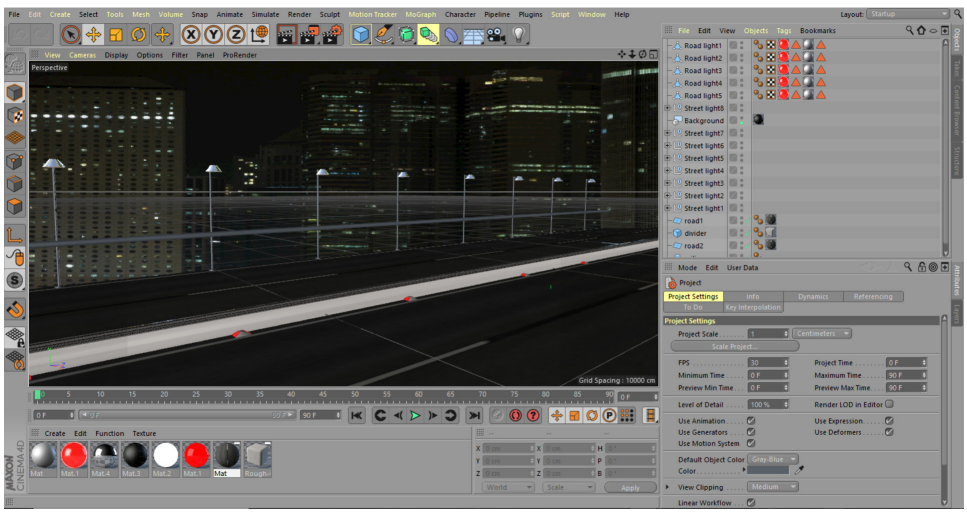

Figure 6-7 *The c06_tut2_start.c4d file*

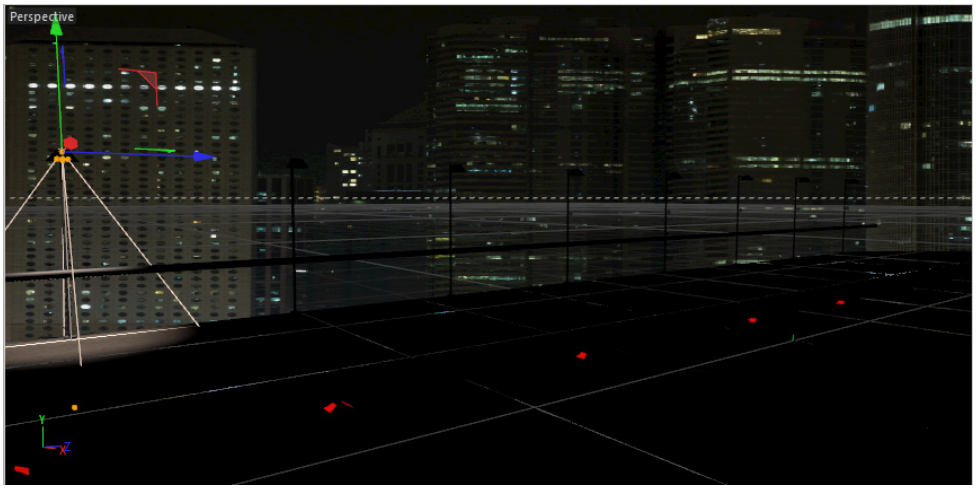

Figure 6-8 *Light positioned in the scene*

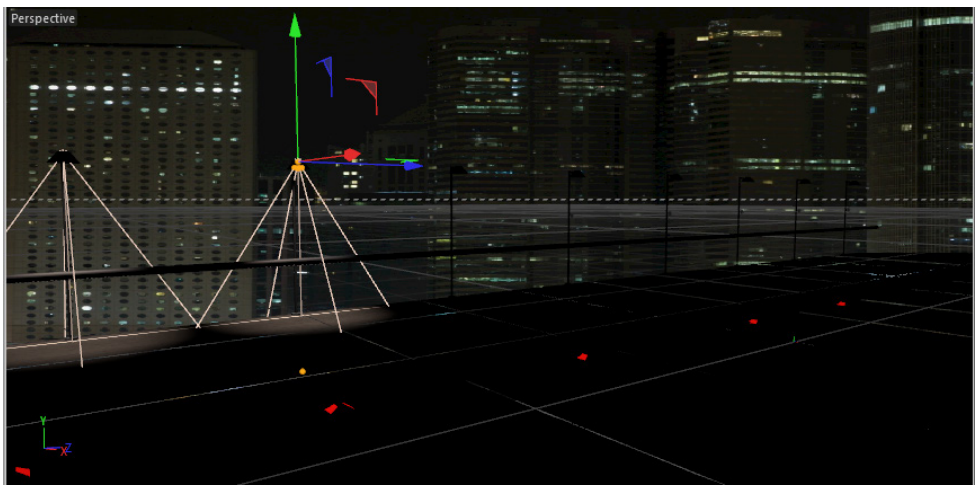

Figure 6-9 *Light.1 positioned in the scene*

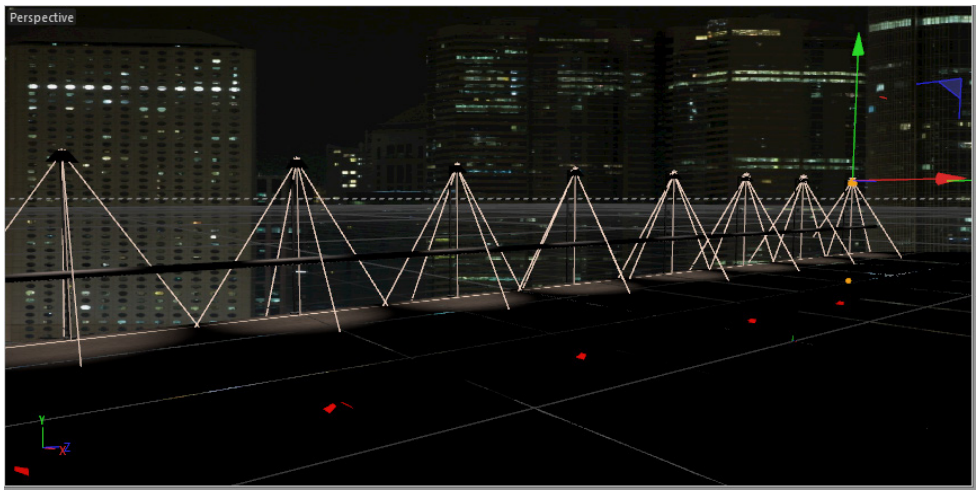

Figure 6-10 *Lights positioned in the Perspective viewport*

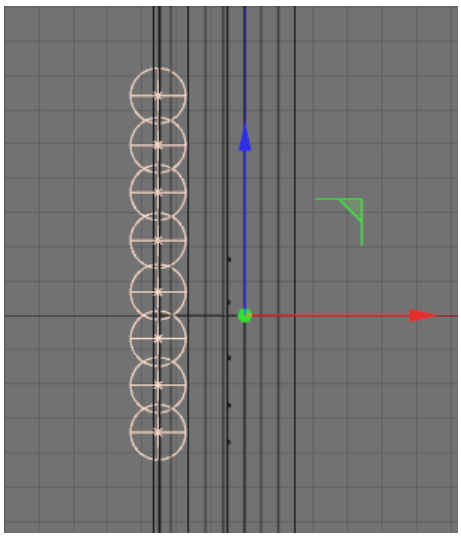

Figure 6-11 *Light.8 created in the Top viewport*

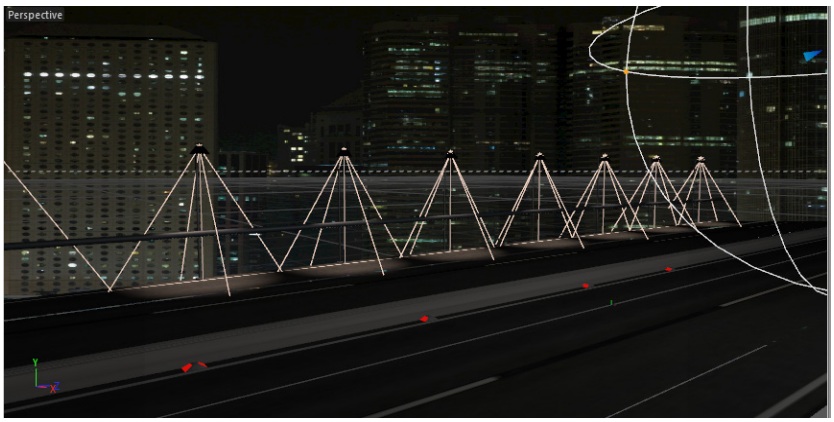

Figure 6-12 *Light.8 positioned in the scene*



Figure 6-13 *The light house*

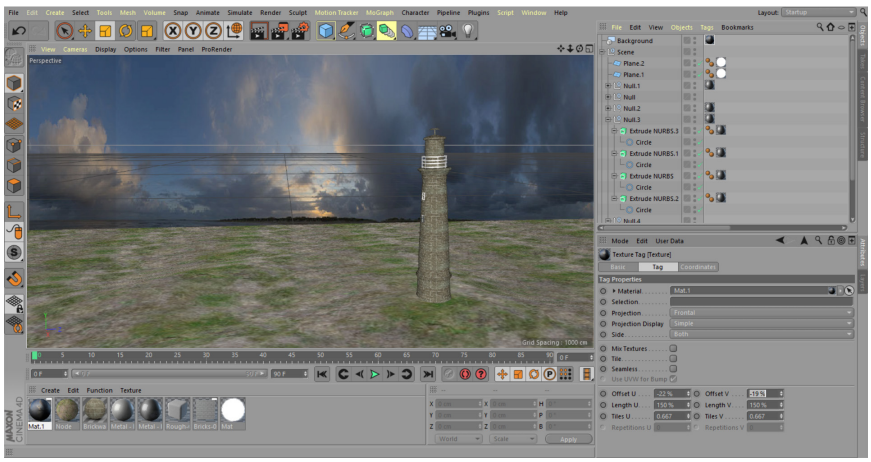

Figure 6-14 *The c06_tut3_start.c4d file*

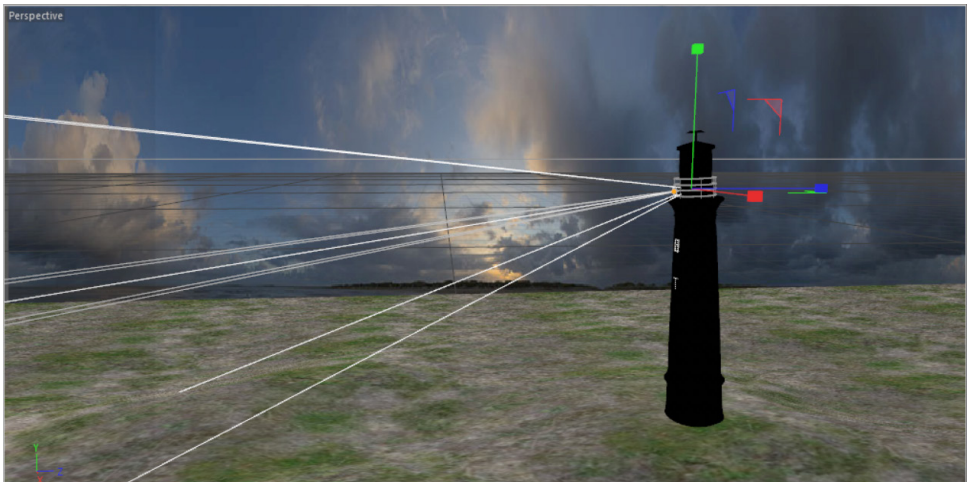

Figure 6-15 *The spot light positioned in the Perspective viewport*

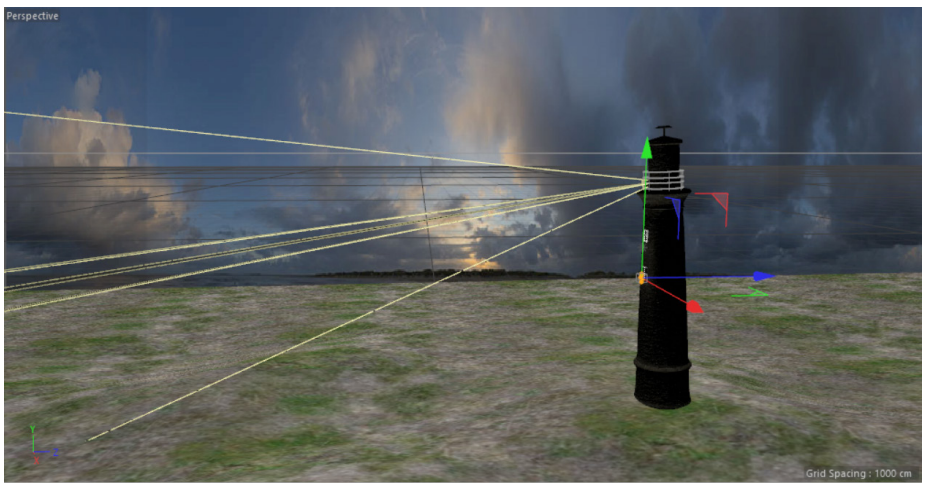

Figure 6-16 *The Area lights positioned in the Perspective viewport*

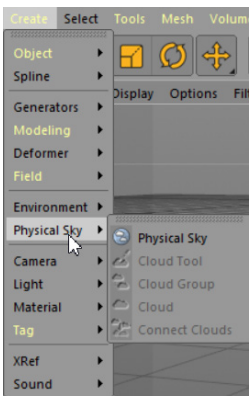

Figure 6-17 *Choosing* ***Physical Sky*** *from the main menu*

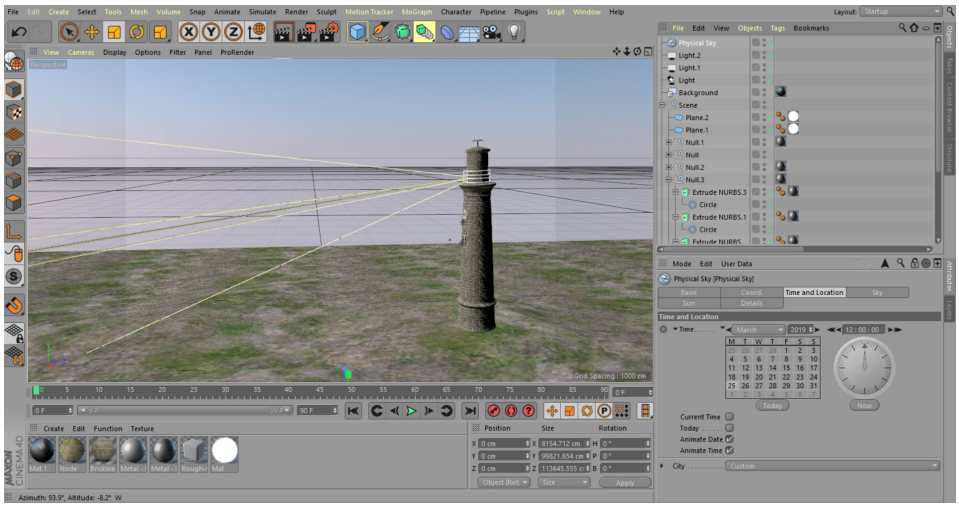

Figure 6-18 *Physical Sky added to the Object Manager*

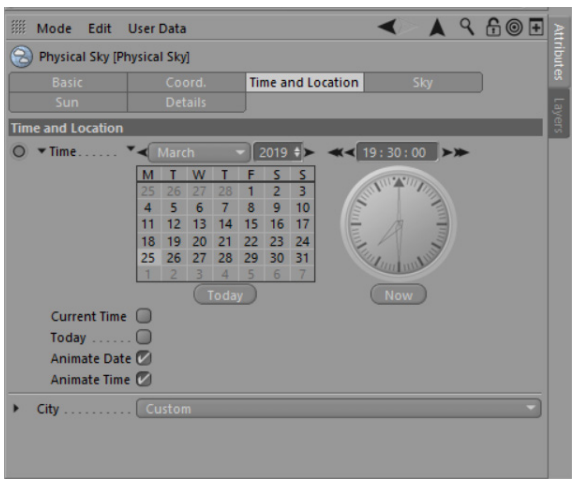

Figure 6-19 *The* ***Time and Location*** *area*



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*

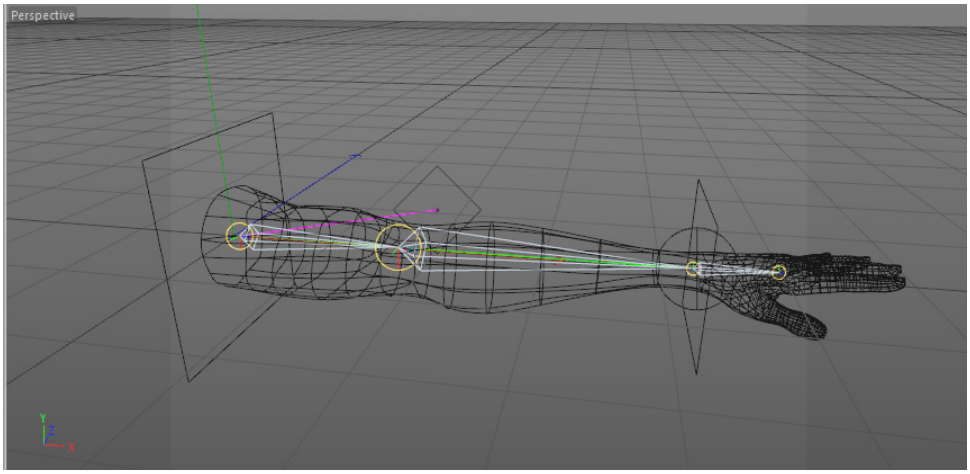

Figure 7-1 *The rig of the hand*

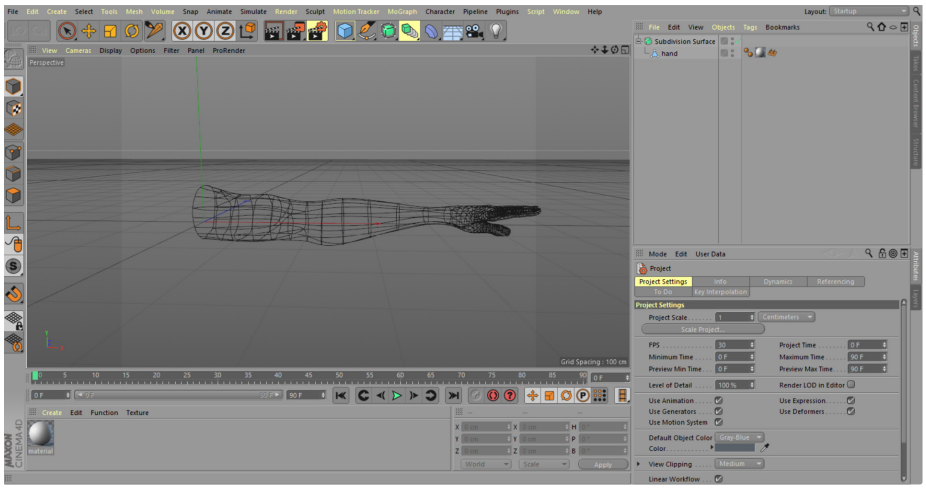

Figure 7-2 *The c07_tut1_start file*

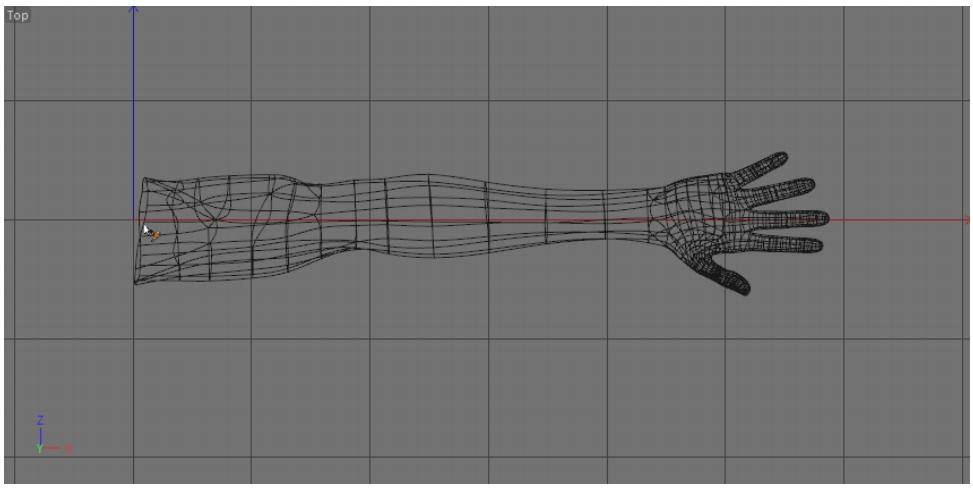

Figure 7-3 *Clicking on the shoulder joint of the hand*

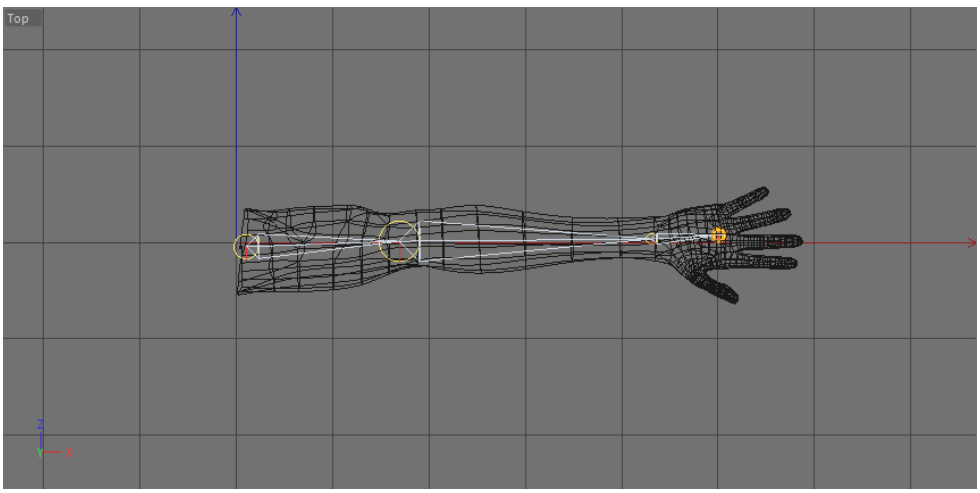

Figure 7-4 *Bone structure created*

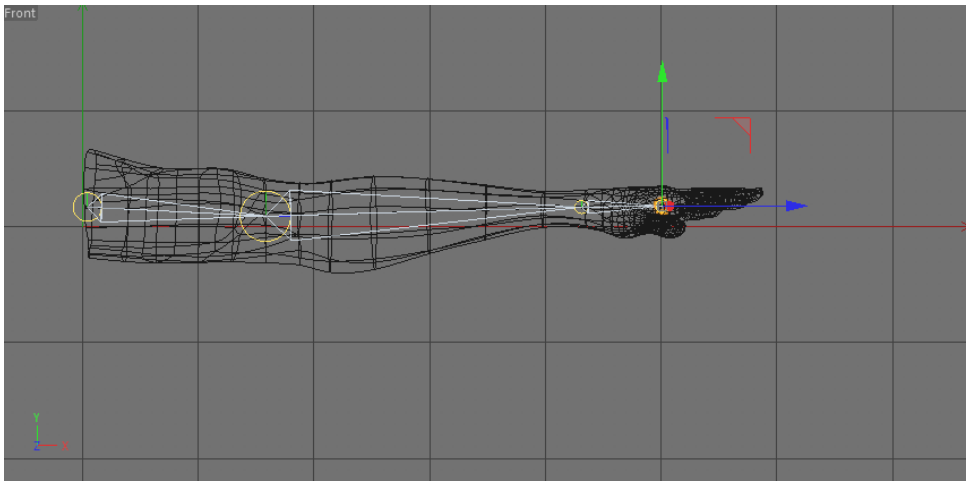

Figure 7-5 *All joints aligned in the Front viewport*

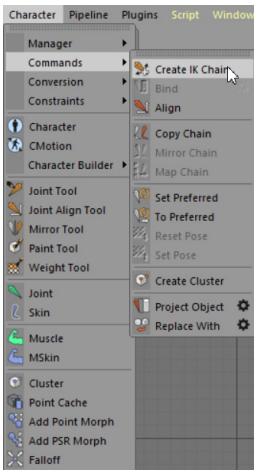

Figure 7-6 *Choosing the* ***Create IK Chain*** *from the main menu*

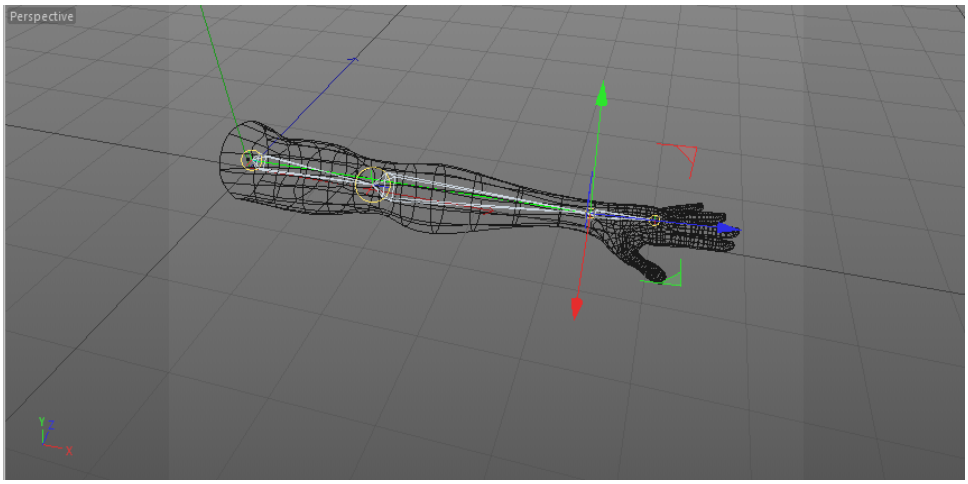

Figure 7-7 *The IK chain created in the Perspective viewport*

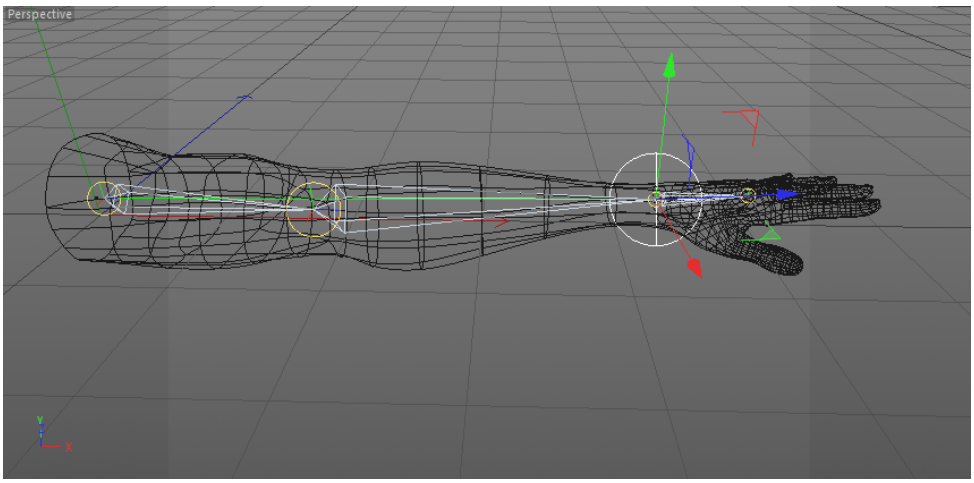

Figure 7-8 *The changed icon of wrist_joint.Goal*

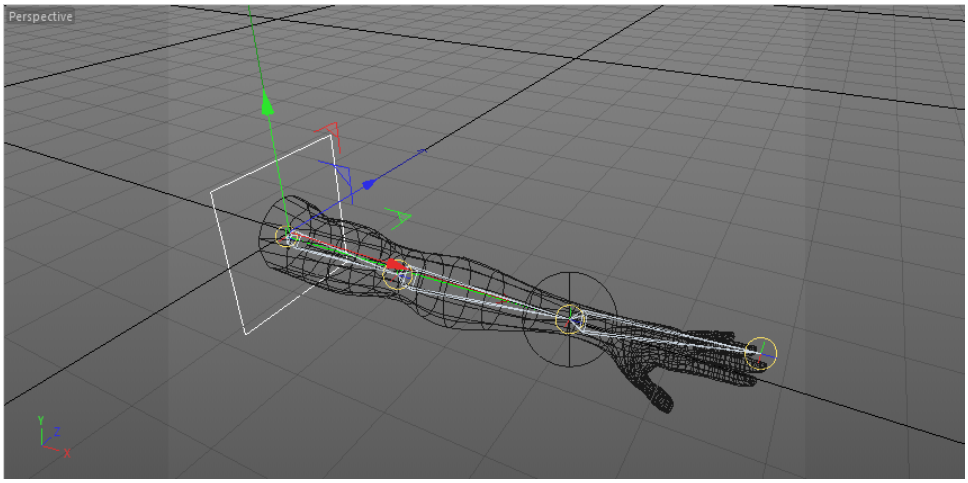

Figure 7-9 *The shoulder control in the Perspective viewport*

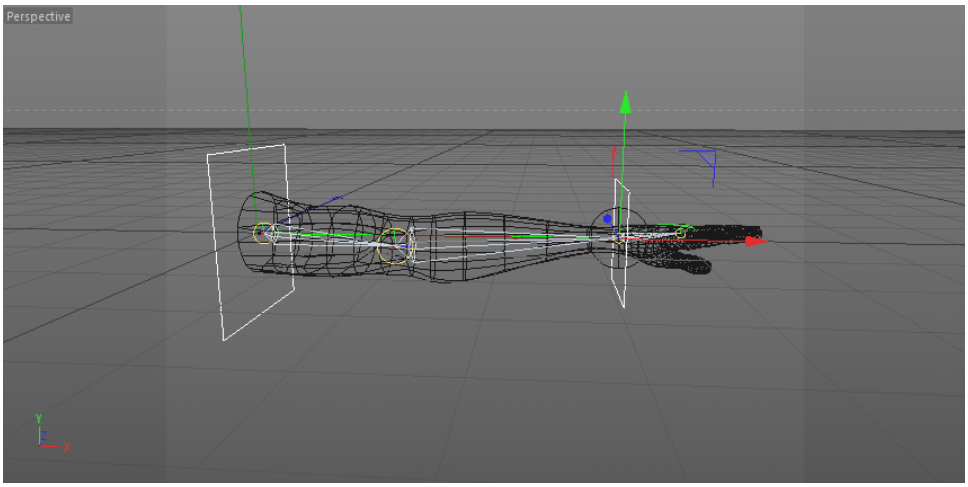

Figure 7-10 *Displaying the controllers of hand*

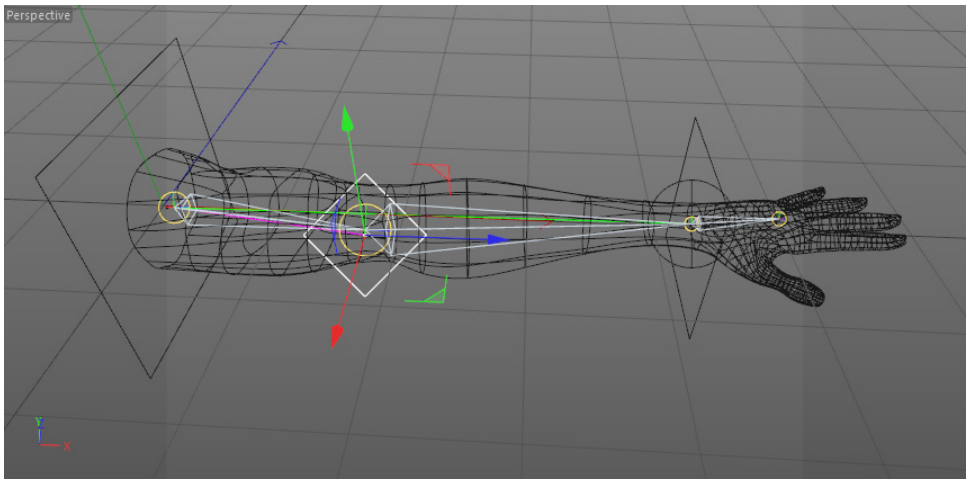

Figure 7-11 *The changed icon of shoulder_joint.Pole*

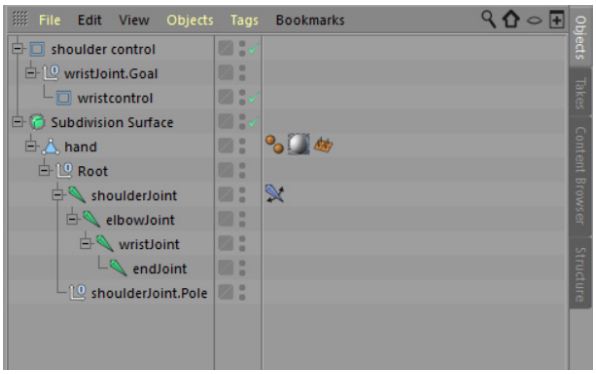

Figure 7-12 *Hierarchy for controls in the Object Manager*

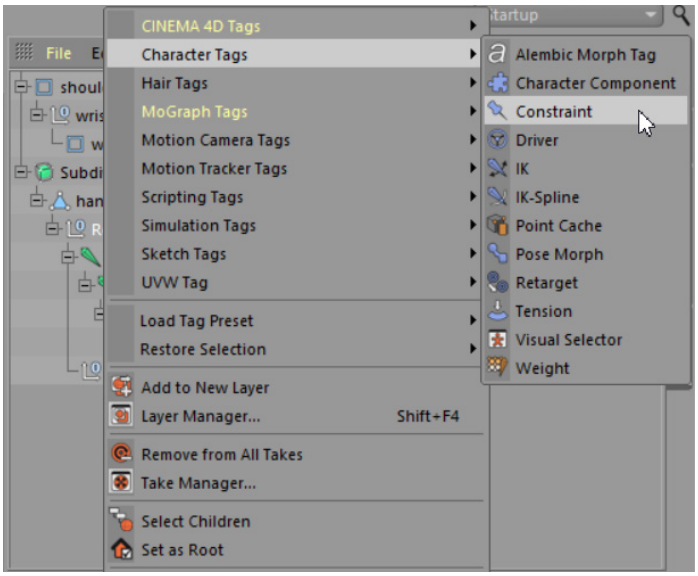

Figure 7-13 *Choosing* ***Constraint*** *from the shortcut menu*

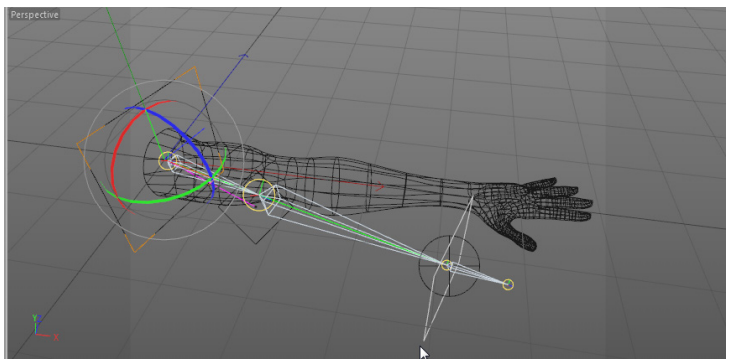

Figure 7-14 *All joints and controls rotating along with shoulder control in the Perspective viewport*

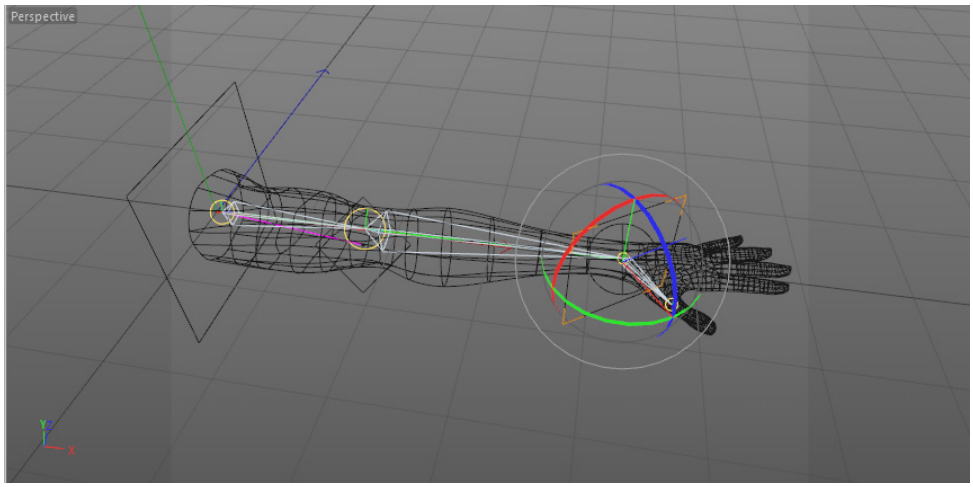

Figure 7-15 *The wrist_joint and end_joint rotating along with wrist control*

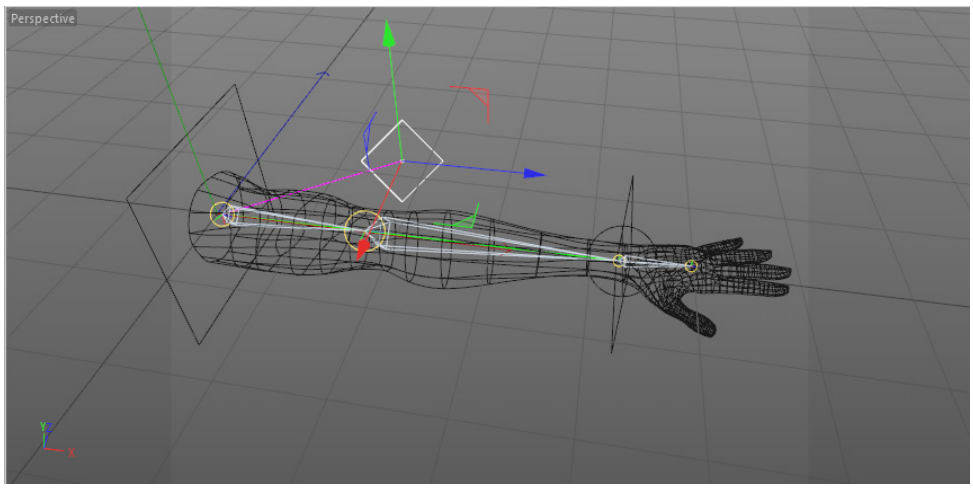

Figure 7-16 *Position of shoulder_joint.Pole changed*

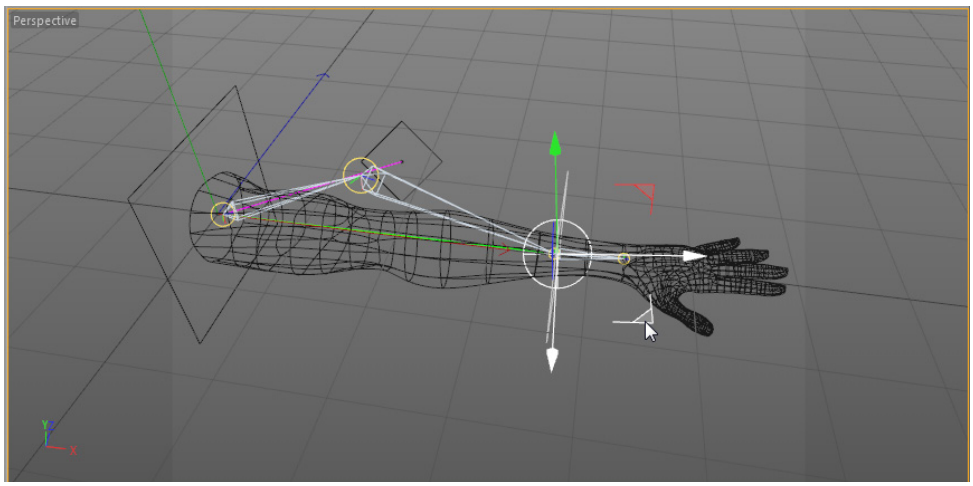

Figure 7-17 *Elbow movement controlled by wrist_joint.Goal*

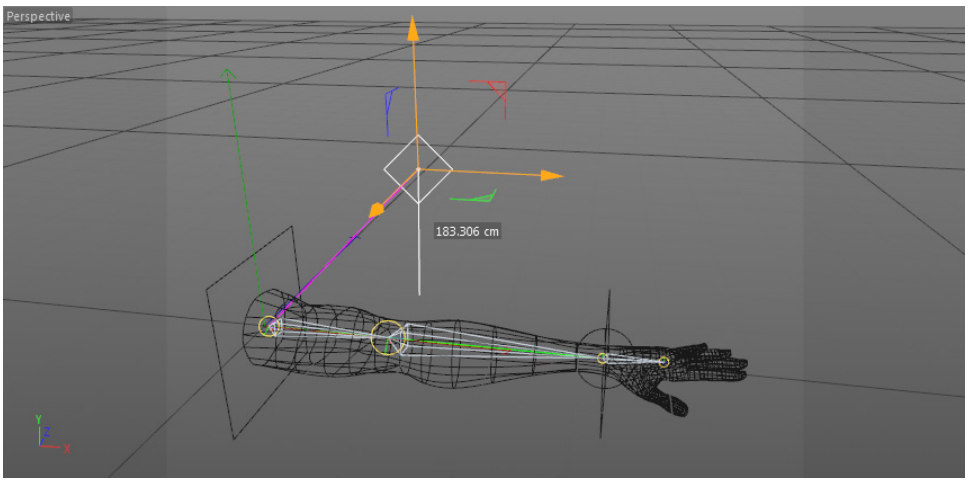

Figure 7-18 *Elbow rotation controlled by shoulder_joint.Pole*

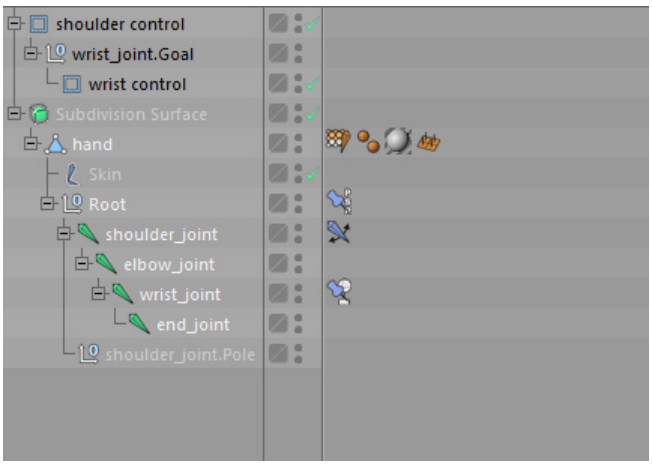

Figure 7-19 *Skin added in the Object Manager*

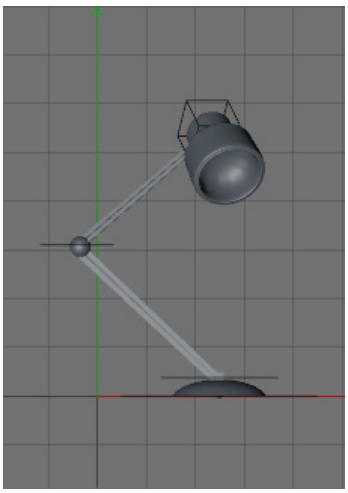

Figure 7-20 *Rig for a table lamp*

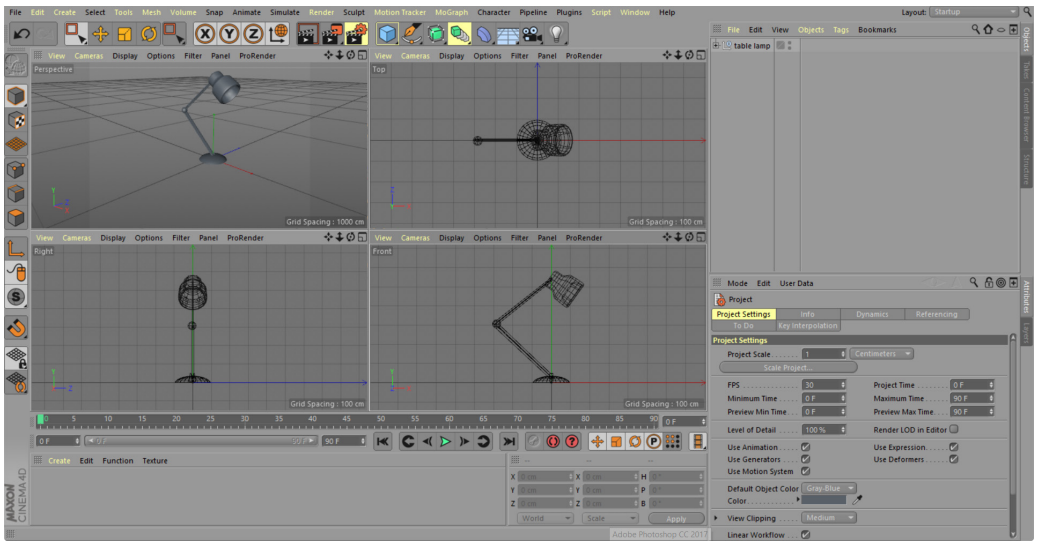

Figure 7-21 *The c07_tut2_start file*

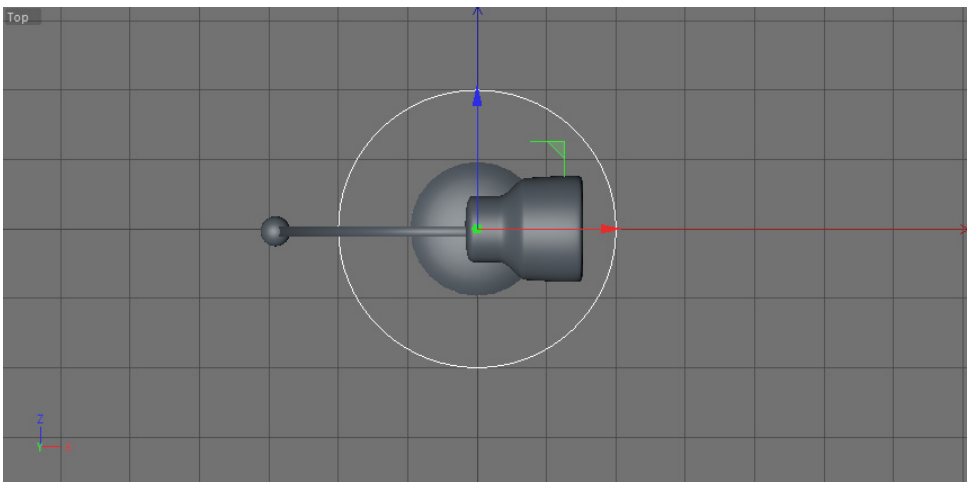

Figure 7-22 *The main control in the Top viewport*

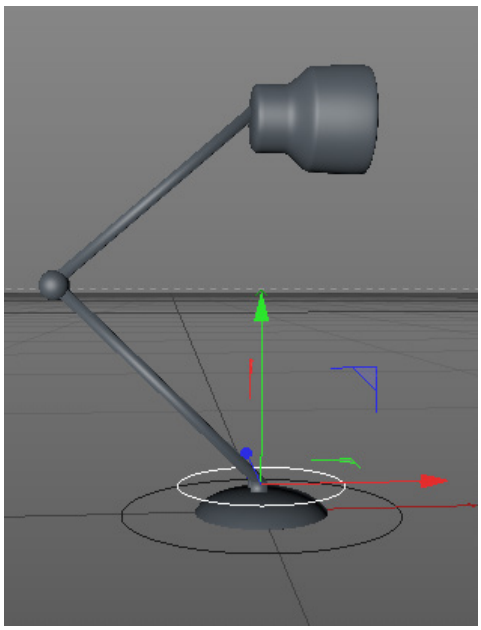

Figure 7-23 *The support control in the Perspective viewport*

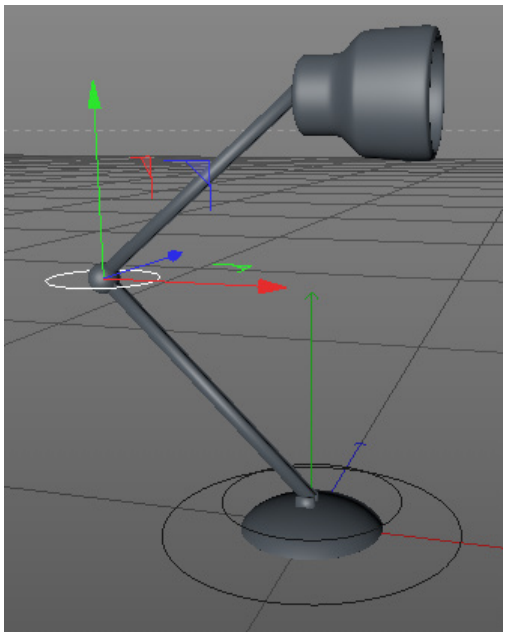

Figure 7-24 *The center control in the Perspective viewport*

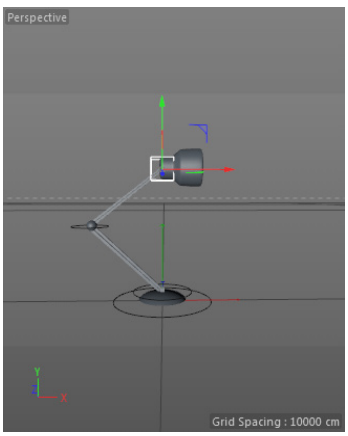

Figure 7-25 *The lamp control in the Perspective viewport*

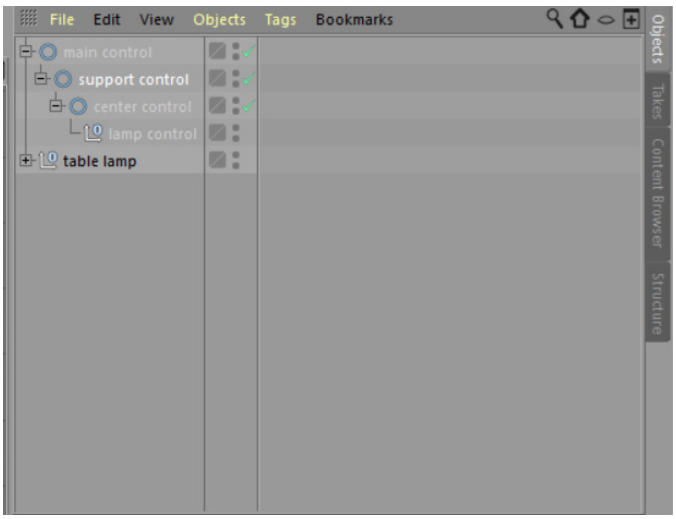

Figure 7-26 *All controls connected in the Object Manager*

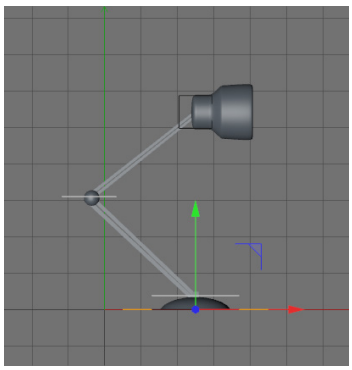

Figure 7-27 *The table lamp moving along with main control*

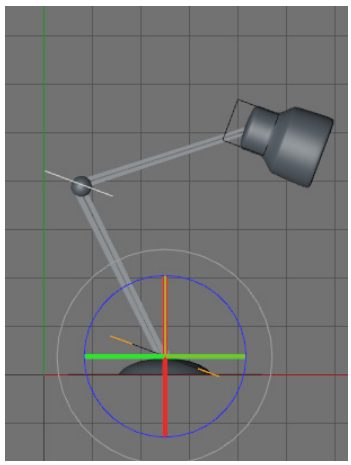

Figure 7-28 *Supports and lamp shade rotating along with support control*

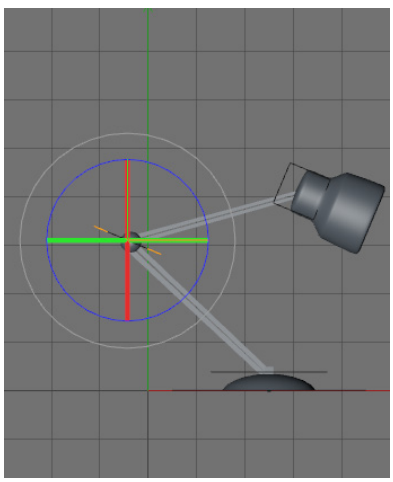

Figure 7-29 *The support2 and lamp shade rotating along with center control*

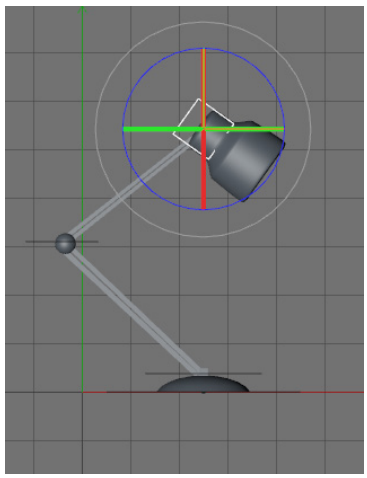

Figure 7-30 *The lamp shade rotating along with lamp control*

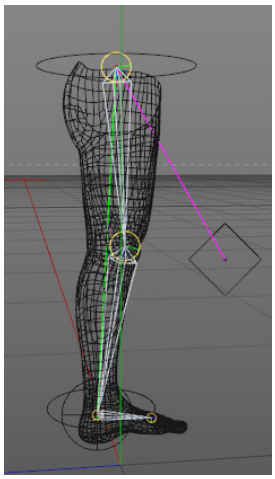

Figure 7-31 *Rig for a human leg*

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*

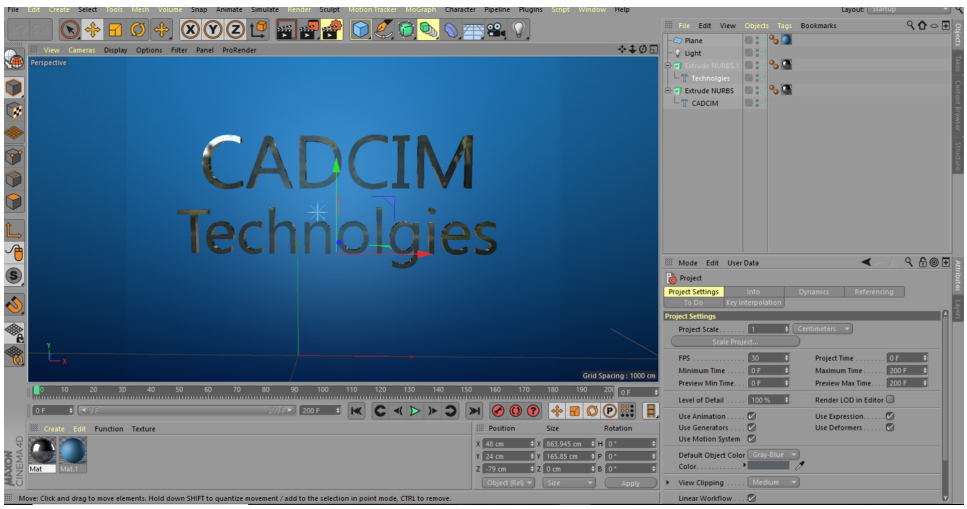

Figure 8-2 *The c08_tut1_start.c4d file*

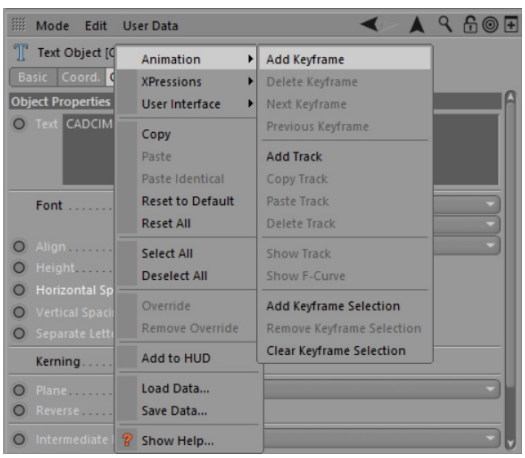

Figure 8-3 *Choosing the* ***Add Keyframe*** *option from the shortcut menu*



Figure 8-4 *Timeslider set to frame 20*

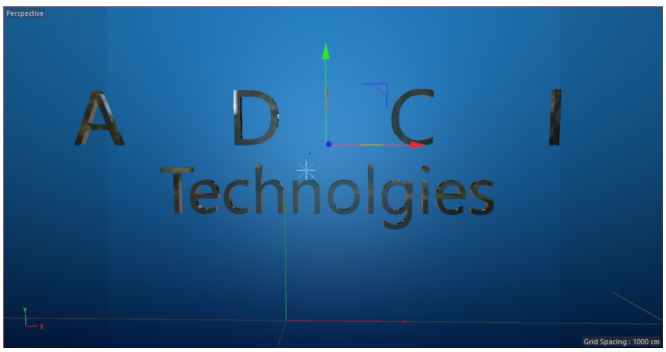

Figure 8-5 *The space added between the text*



Figure 8-6 *The CADCIM text at frame 65*



Figure 8-7 *The CADCIM text at frame 75*

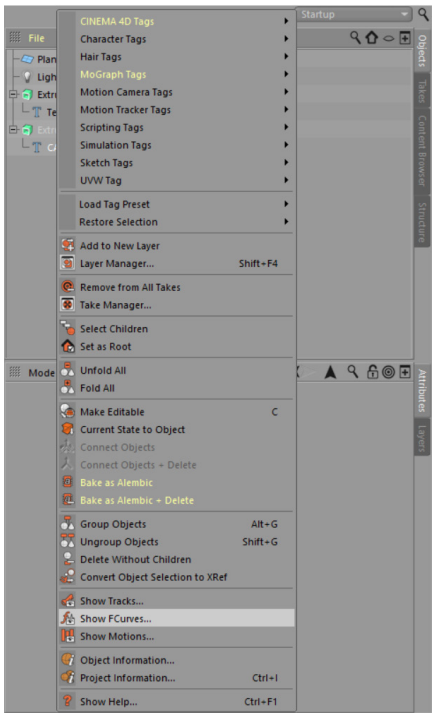

Figure 8-8 *Choosing* ***Show FCurves*** *from the shortcut menu*

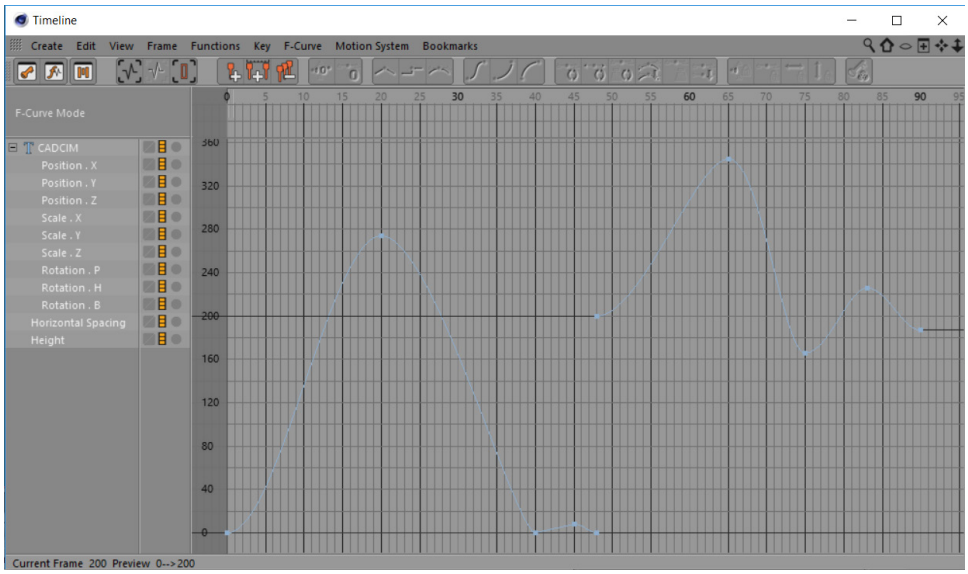

Figure 8-9 *The* ***Timeline*** *window*

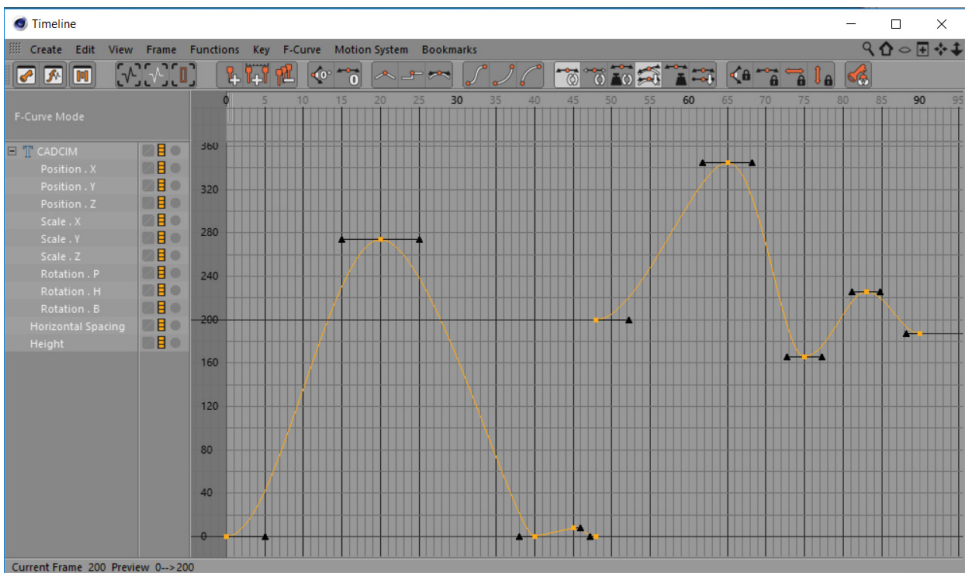

Figure 8-10 *Selecting all the keys in the* ***Timeline*** *window*

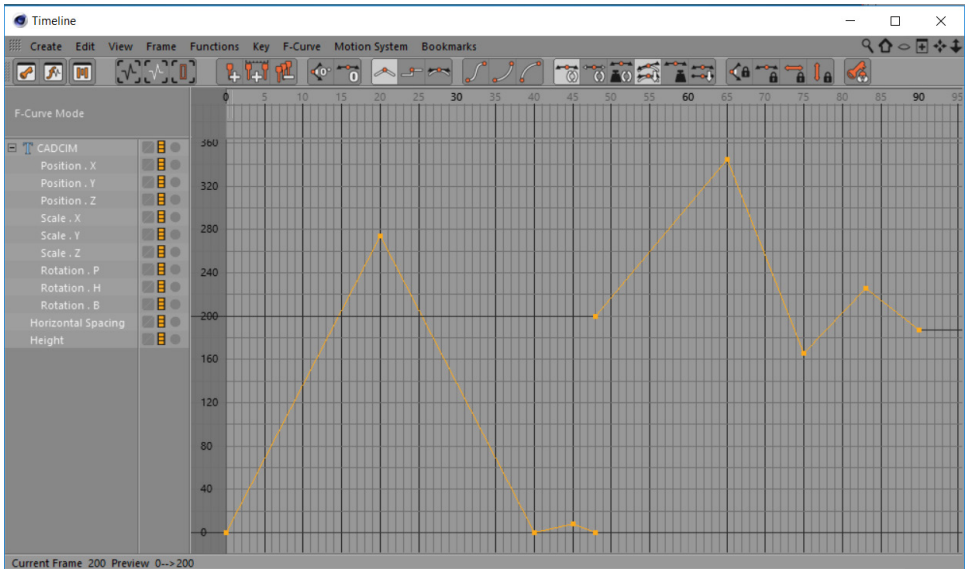

Figure 8-11 *Displaying the linear shape of curves*

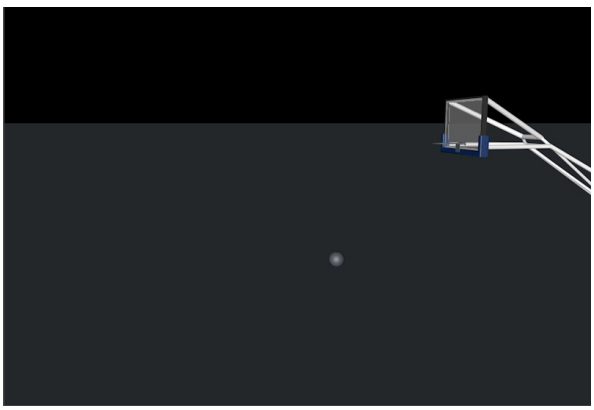

Figure 8-12 *The basket ball at frame 66*

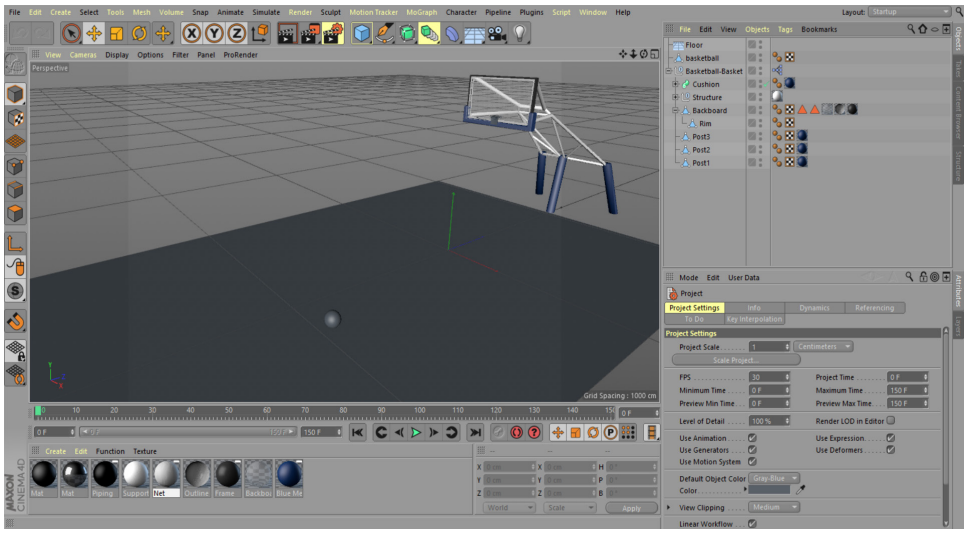

Figure 8-13 *The c08_tut2_start.c4d file*

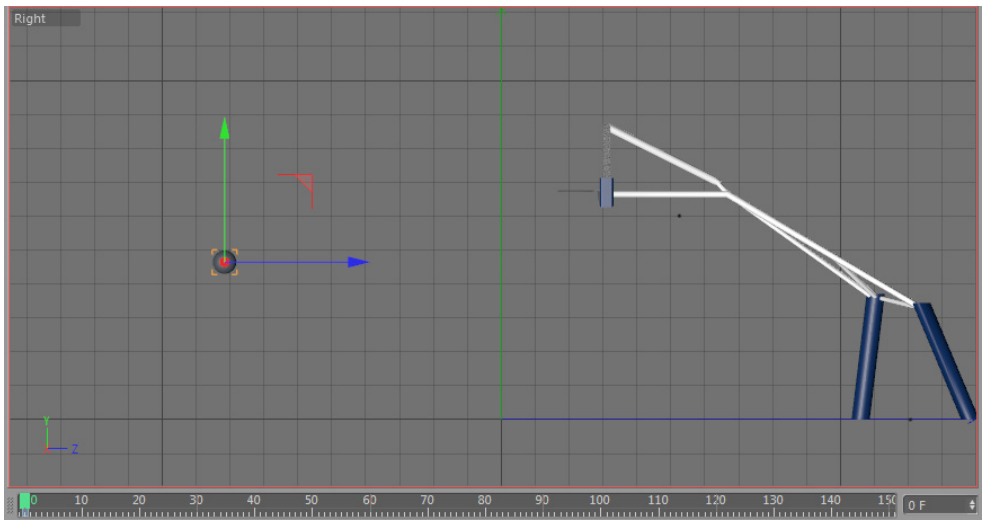

Figure 8-14 *The basketball at frame 0*

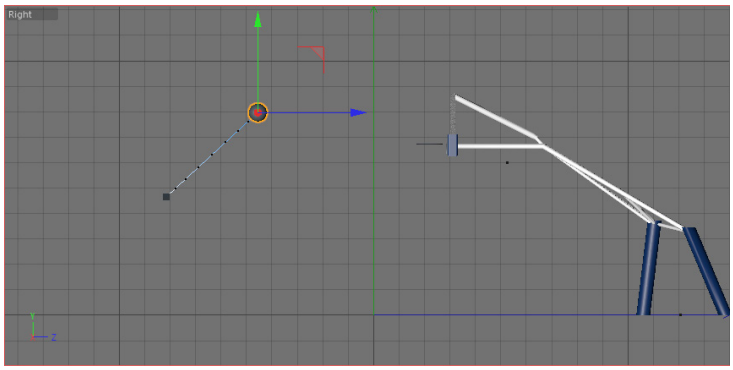

Figure 8-15 *The basketball at frame 10*

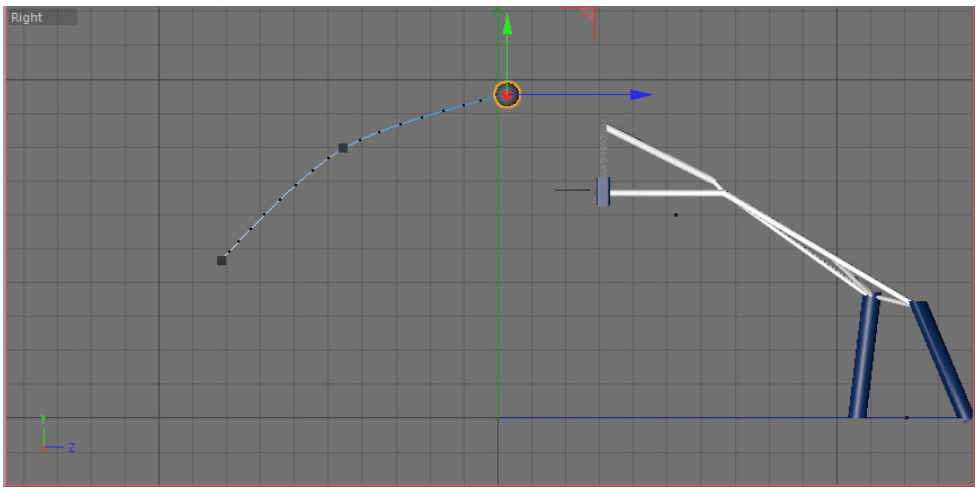

Figure 8-16 *The basketball at frame 20*

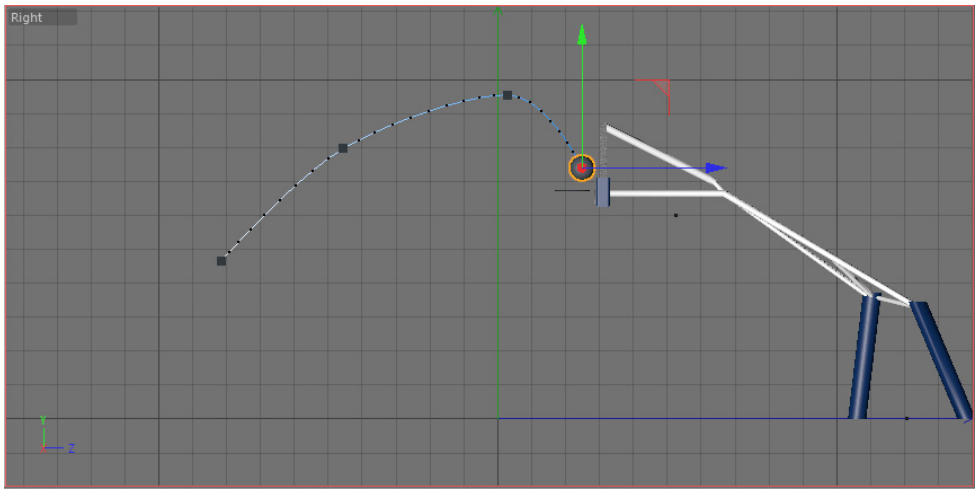

Figure 8-17 *The basketball at frame 30*

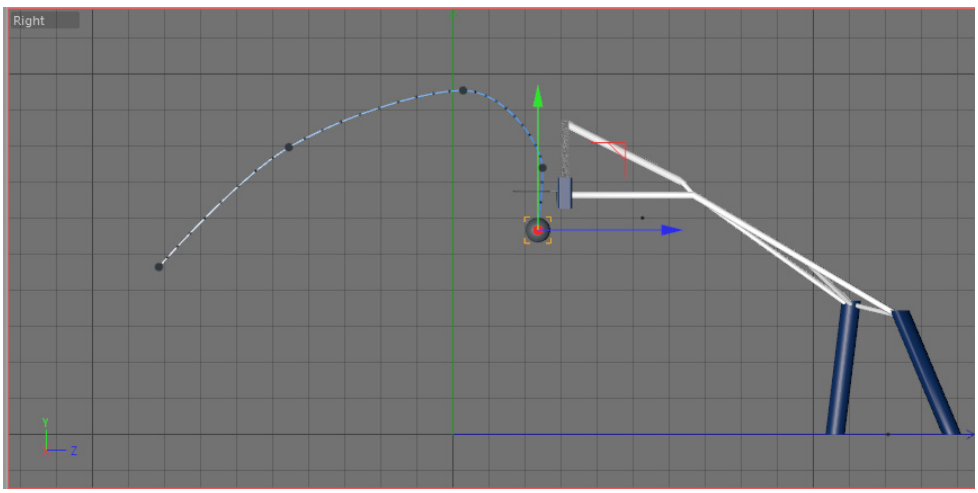

Figure 8-18 *The basketball at frame 34*

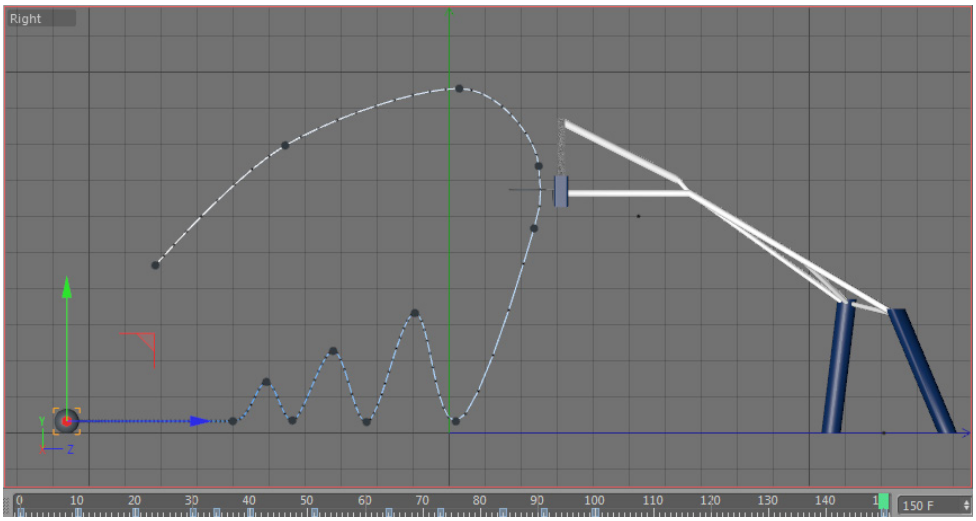

Figure 8-19 *The basketball at frame 150*

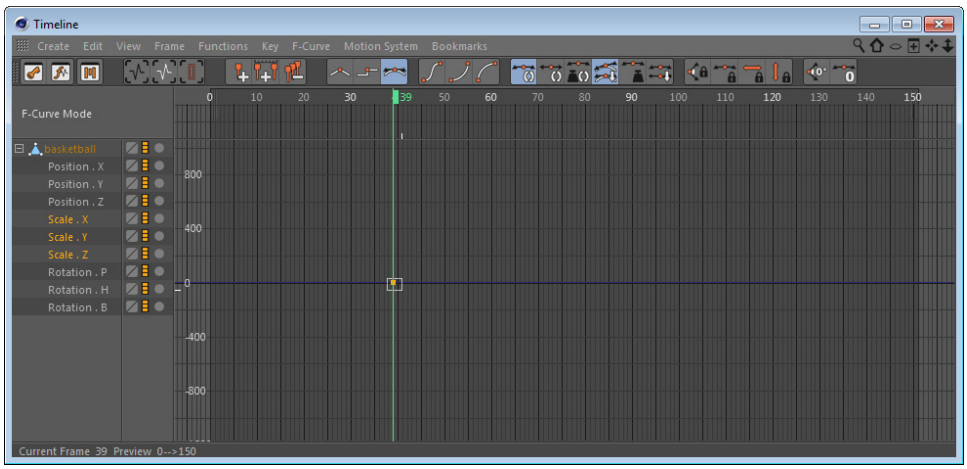

Figure 8-20 *Selecting the keyframe from the* ***Timeline*** *window*

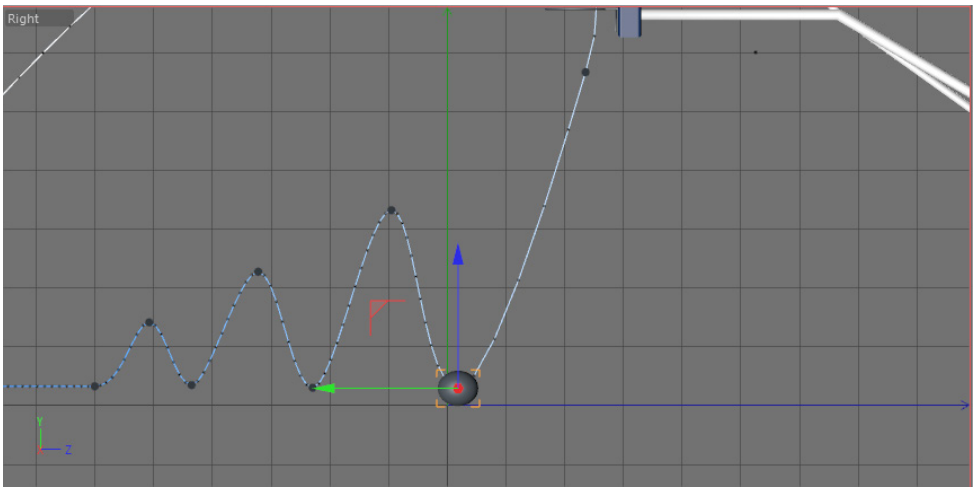

Figure 8-21 *Squashed basketball at frame 40*

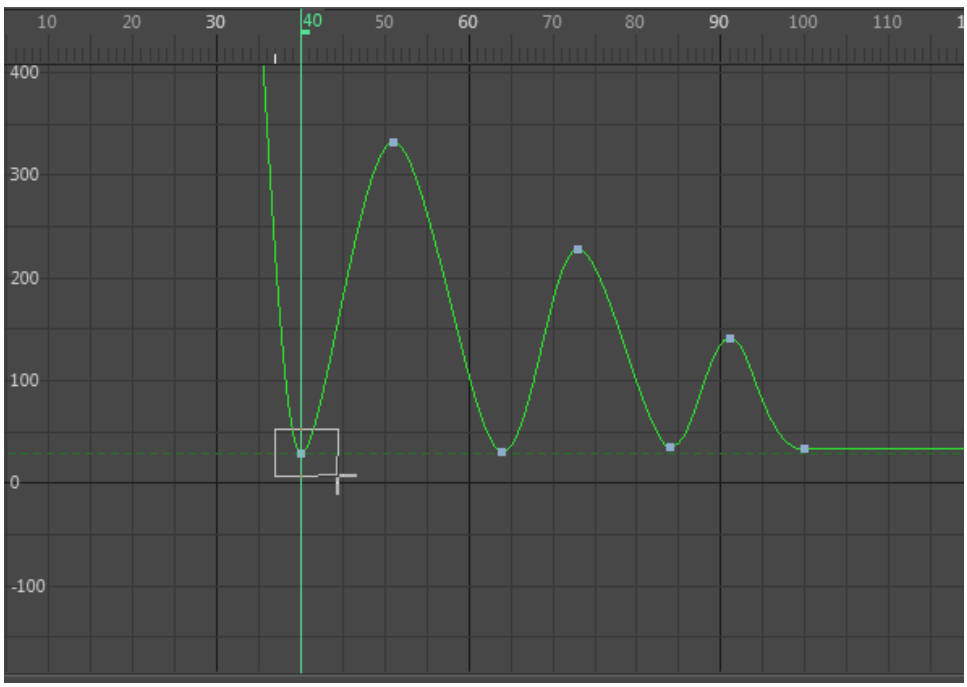

Figure 8-22 *Selecting the keyframe from the* ***Timeline*** *window*

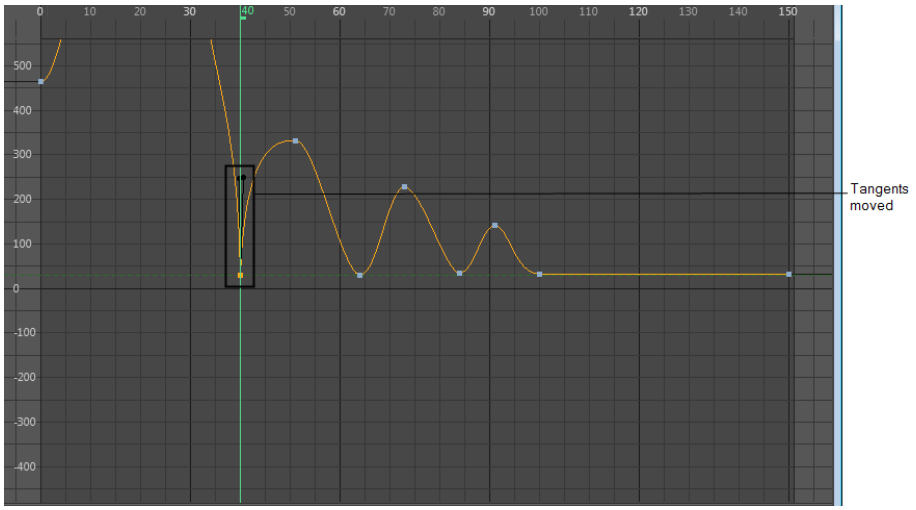

Figure 8-23 *Moving the tangents in the* ***Timeline*** *window*

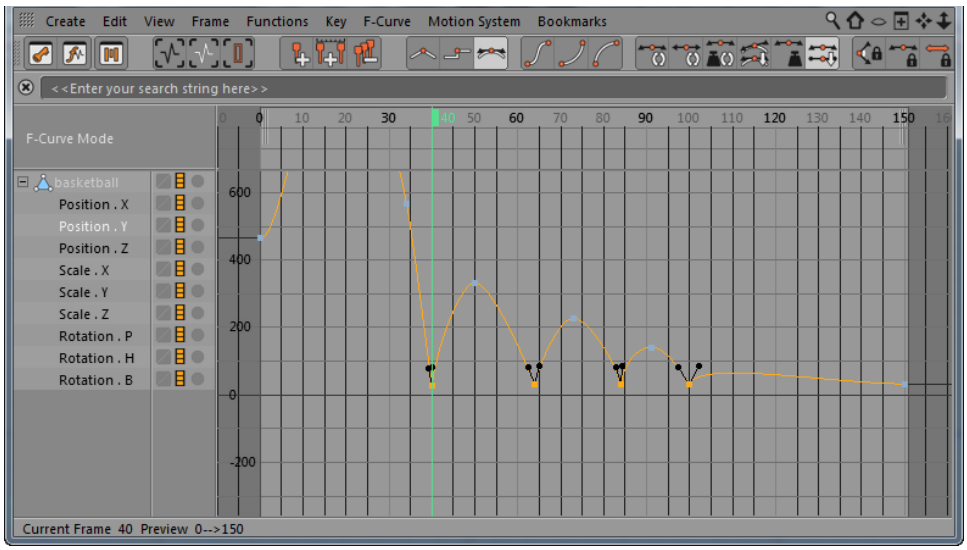

Figure 8-24 *Moving the tangents at other frames*

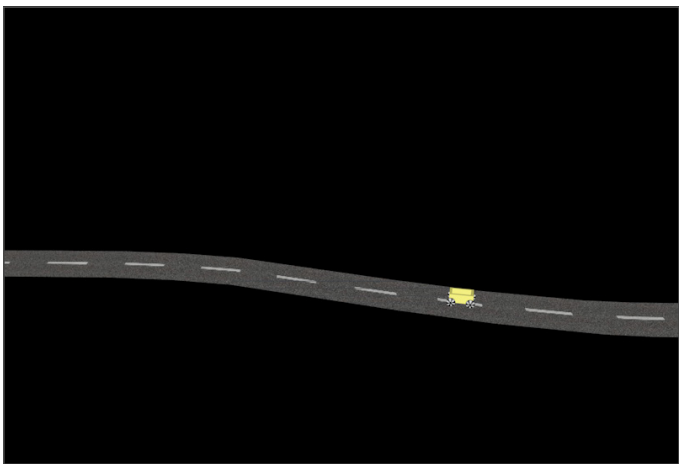

Figure 8-25 *Moving cart at frame 45*

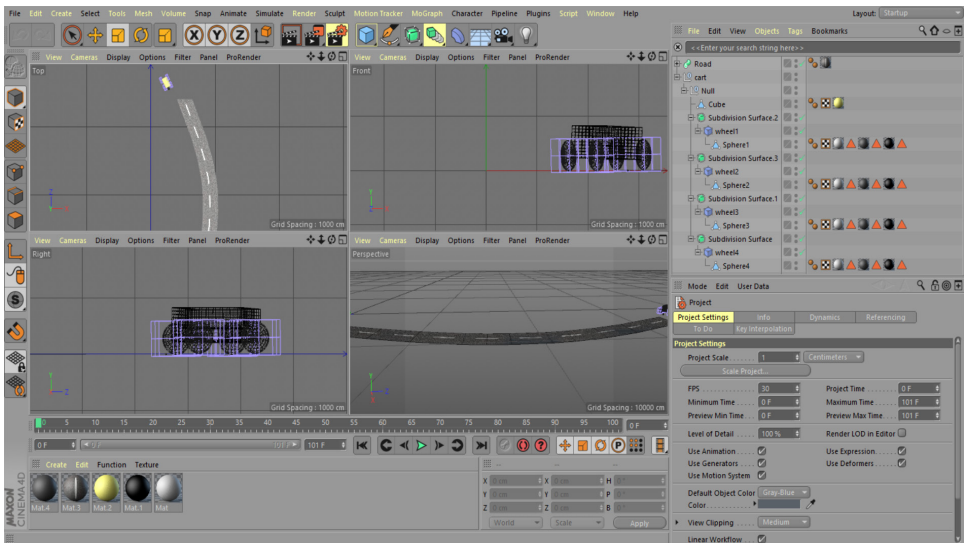

Figure 8-26 *The c08_tut3_start file*

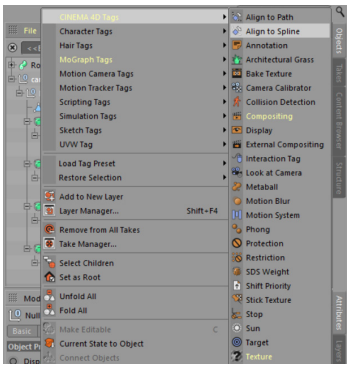

Figure 8-27 *Choosing* ***Align to Spline*** *from the shortcut menu*

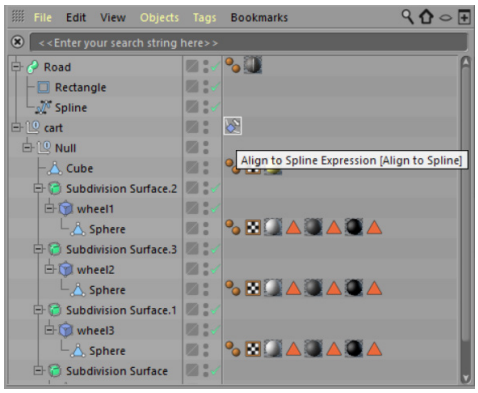

Figure 8-28 *The* ***Align to Spline Expression [Align to Spline]*** *tag in the Object Manager*

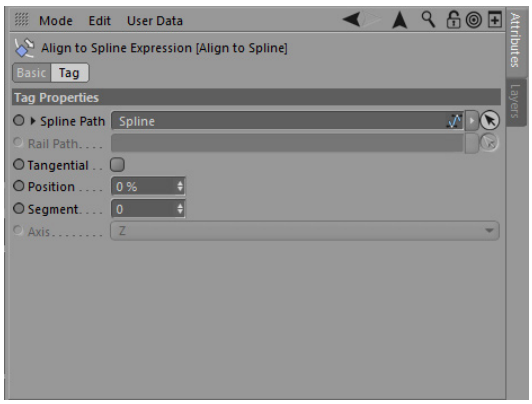

Figure 8-29 *Spline displayed in the* ***Spline Path*** *edit box*

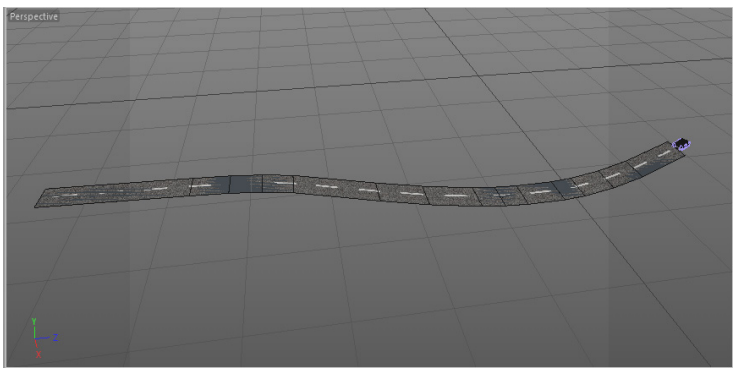

Figure 8-30 *cart aligned with Road*

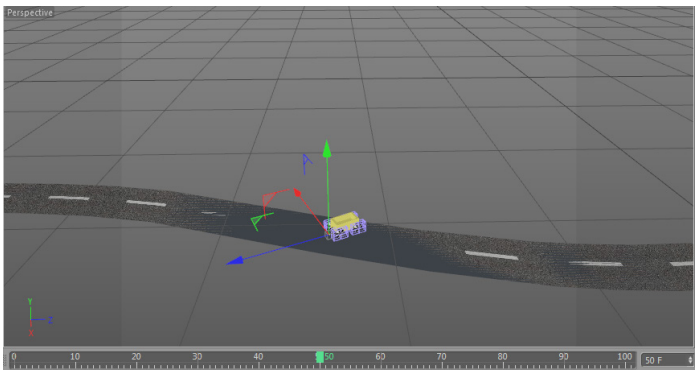

Figure 8-31 *cart at frame 50*

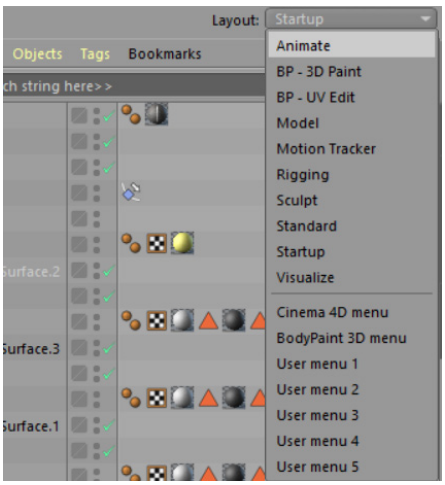

Figure 8-32 *Selecting* ***Animate*** *from the* ***Layout*** *drop-down list*

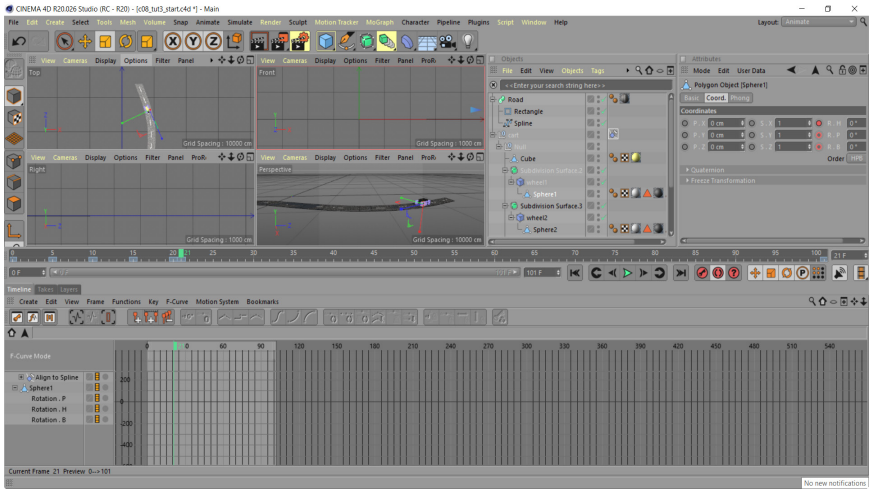

Figure 8-33 *The* ***Animate*** *layout displayed*

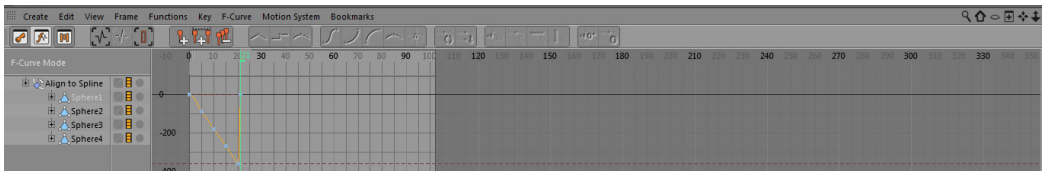

Figure 8-34 *The modified size of the Timeline panel*

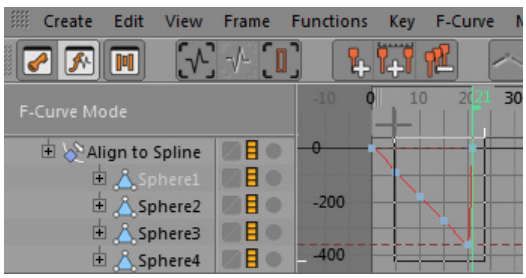

Figure 8-35 *Selecting all keyframes*

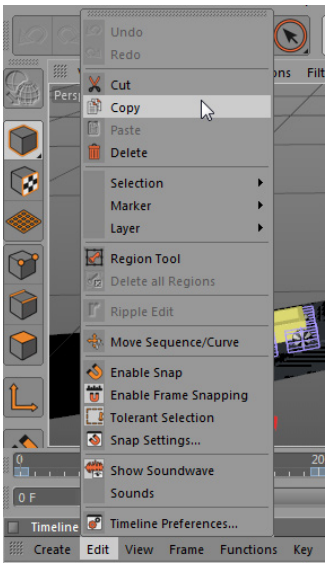

Figure 8-36 *Choosing* ***Copy*** *from the* ***Edit*** *menu*

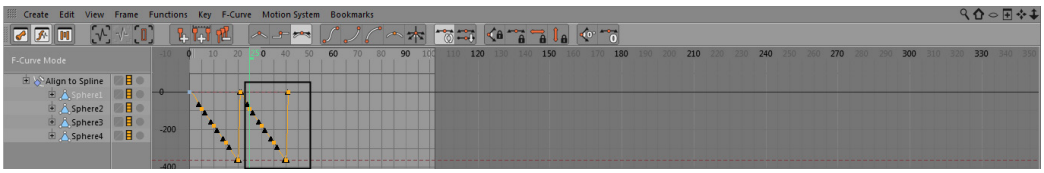

Figure 8-37 *Copied keyframes*

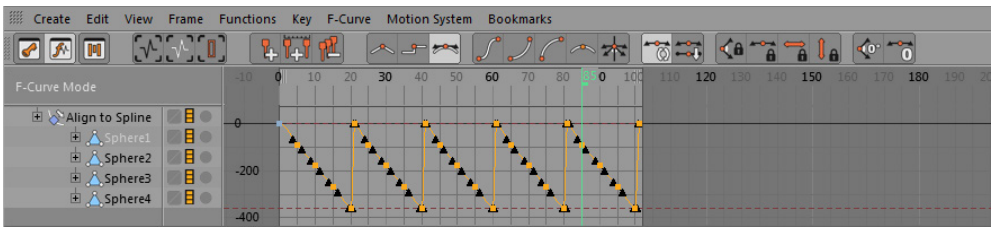

Figure 8-38 *All keyframes for Sphere1*

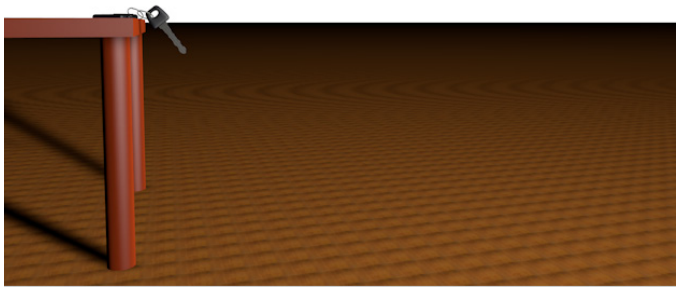

Figure 8-39 *The c08_exr01_start file*

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*

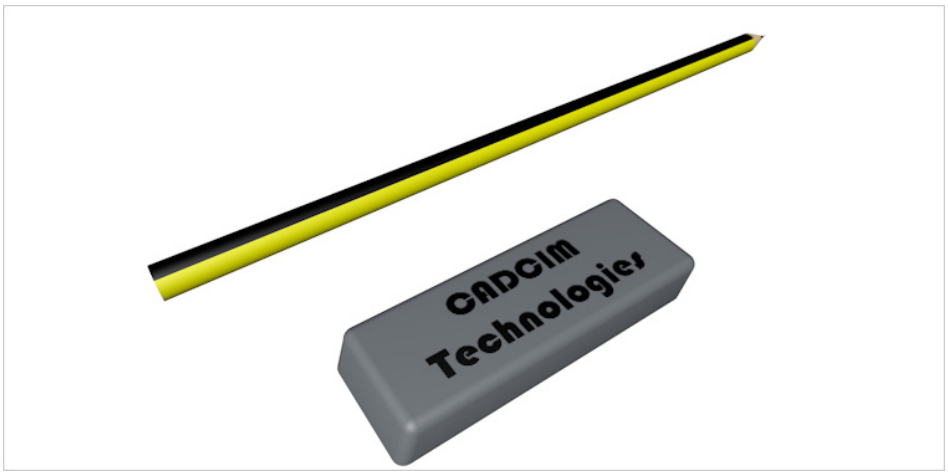

Figure 9-1 *The final output*

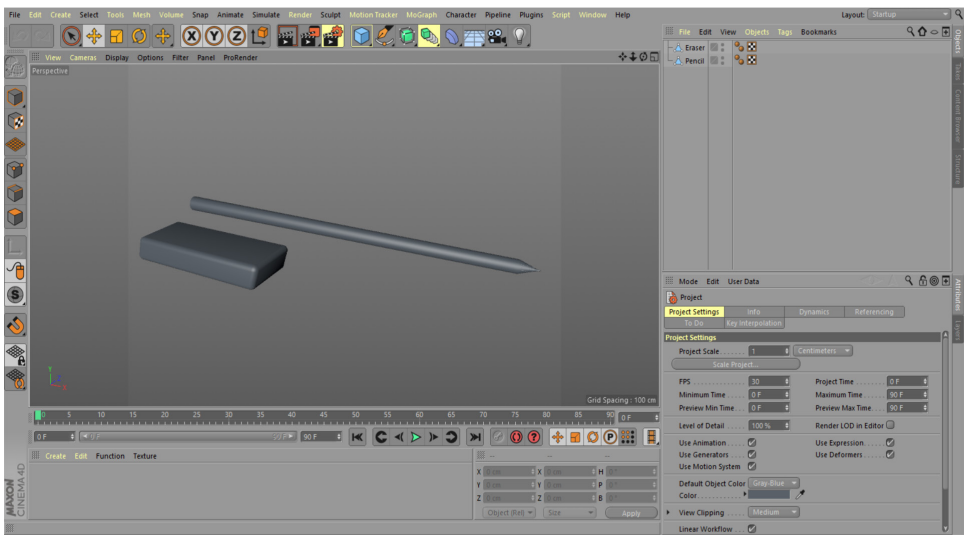

Figure 9-2 *The c09_tut1_start.c4d file*

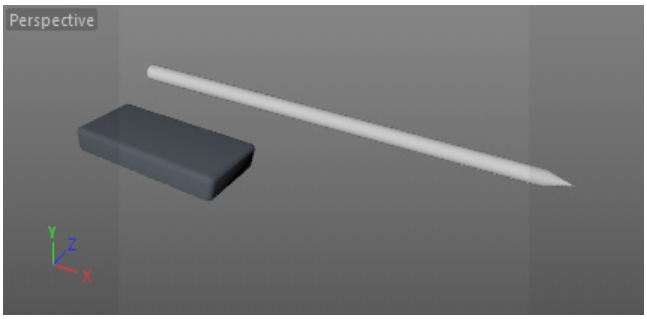

Figure 9-3 *The material applied to Pencil*

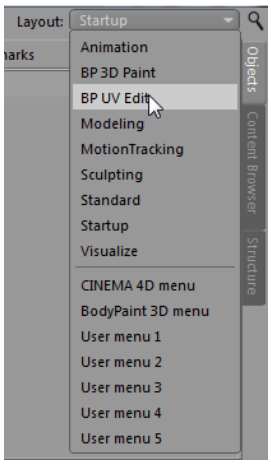

Figure 9-4 *The* ***Layout*** *drop-down list*

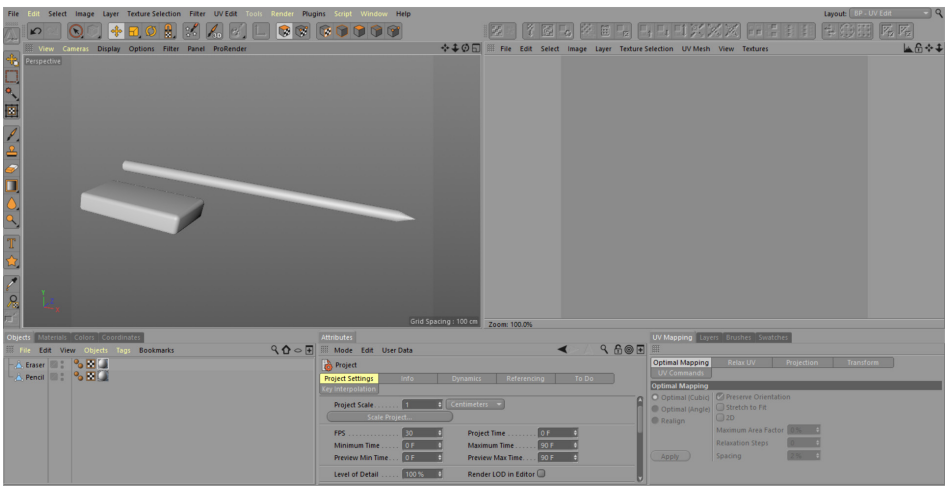

Figure 9-5 *The* ***BP UV Edit*** *layout*

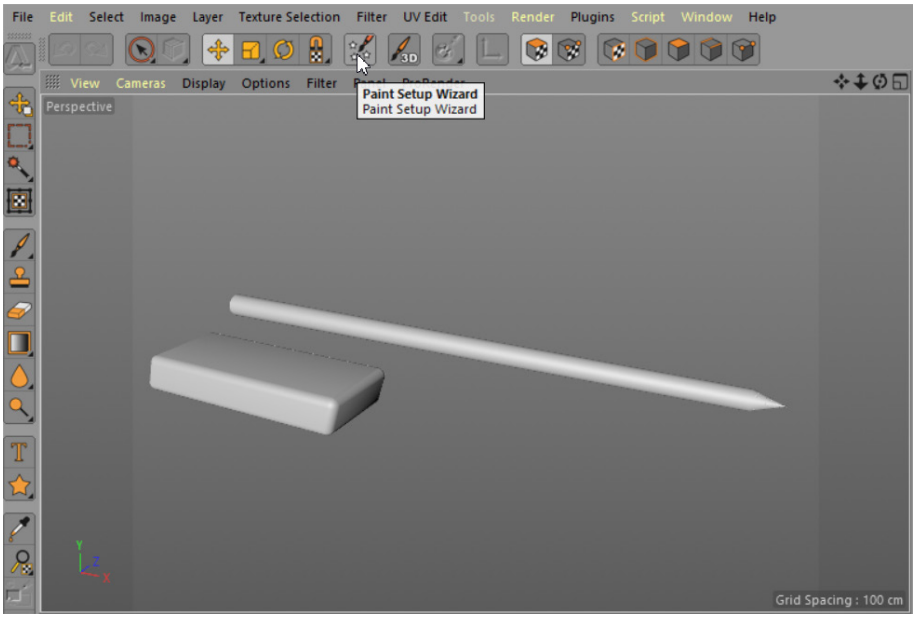

Figure 9-6 *Choosing the* ***Paint Setup Wizard*** *tool from the Command Palette*

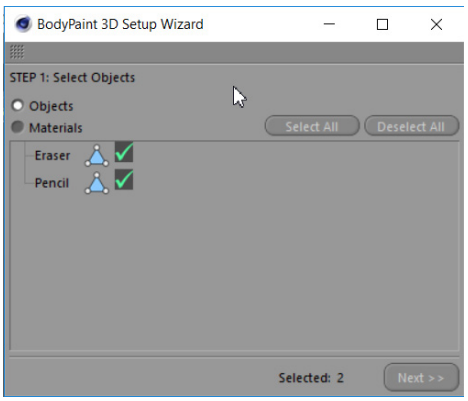

Figure 9-7 *The* ***BodyPaint 3D Setup Wizard*** *dialog box*

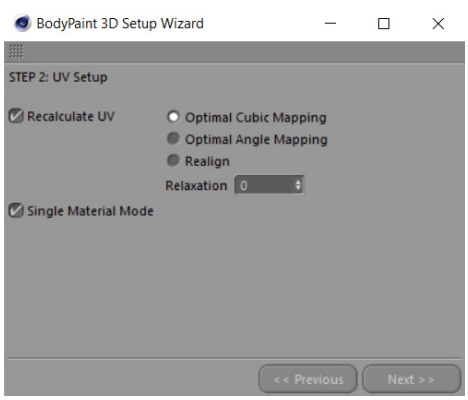

Figure 9-8 *The* ***STEP 2: UV Setup*** *area*

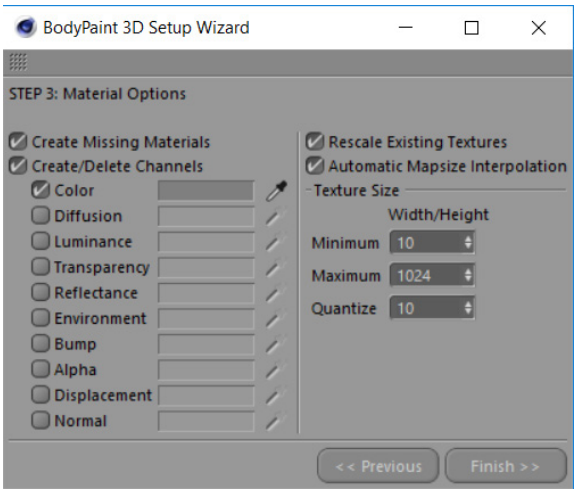

Figure 9-9 *The* ***Material Options*** *area in the* ***BodyPaint 3D Setup Wizard*** *dialog box*

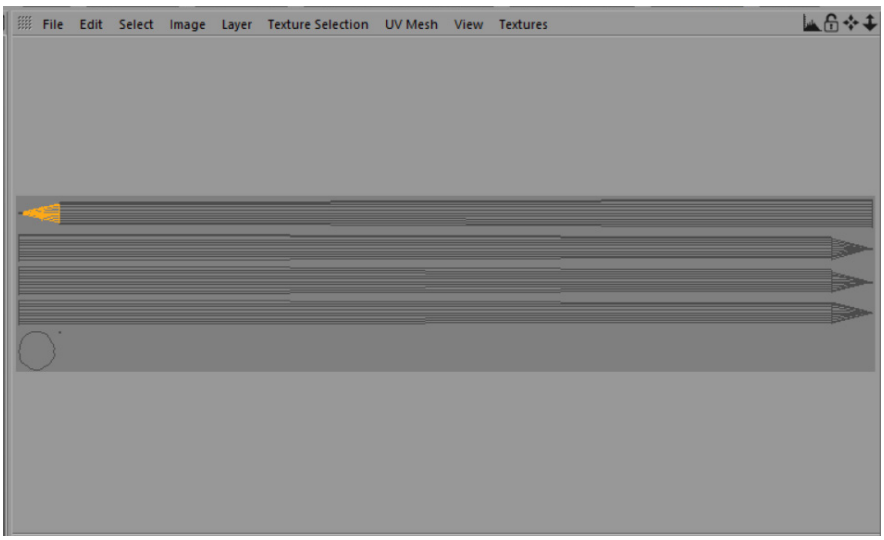

Figure 9-10 *The UV Mesh of Pencil*

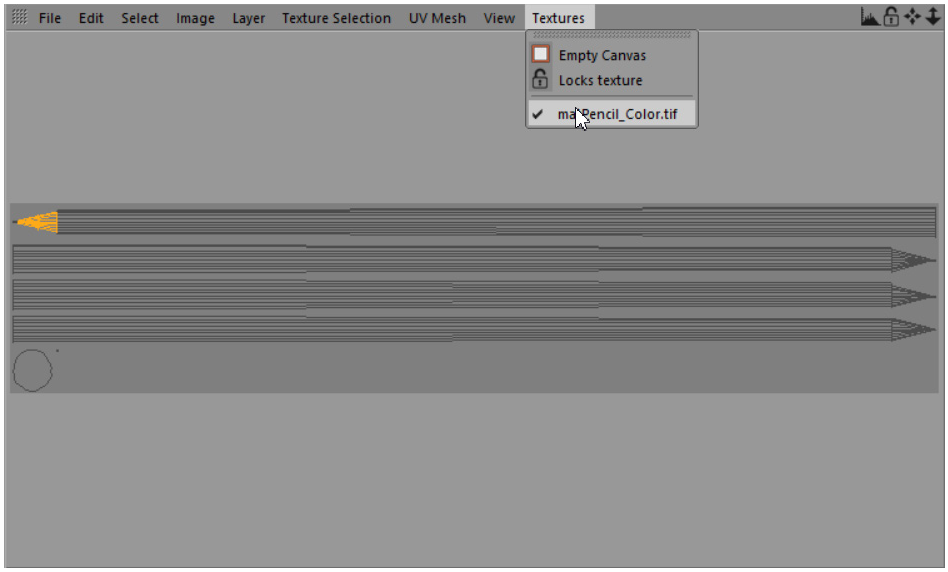

Figure 9-11 *The matPencil_Color.tif option chosen from the* ***Textures*** *menu*

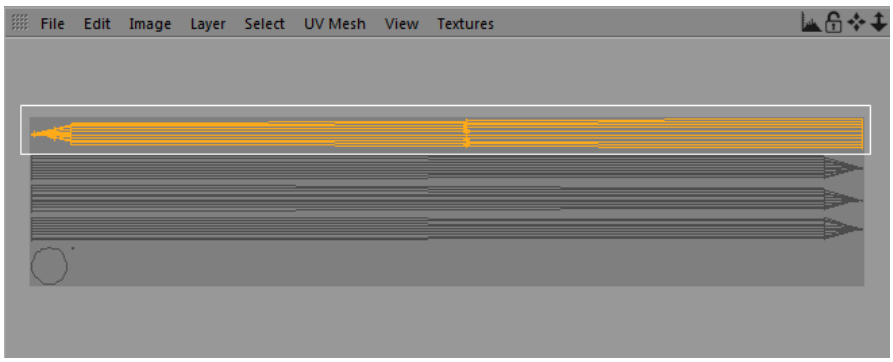

Figure 9-12 *The selected polygons of Pencil*

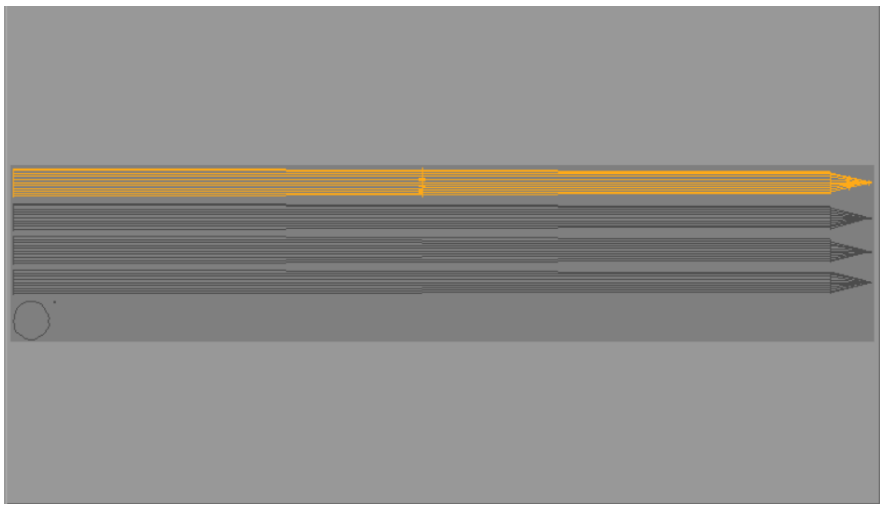

Figure 9-13 *The mirrored polygons*

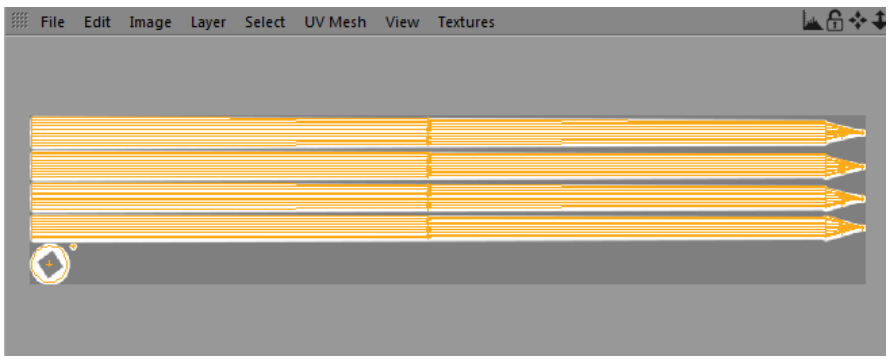

Figure 9-14 *The outlined polygons*

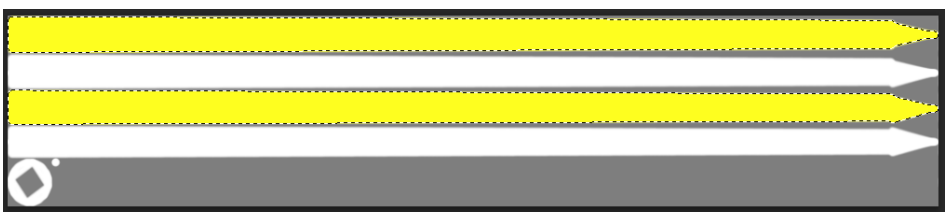

Figure 9-15 *The yellow color in the selected area of the canvas*



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



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

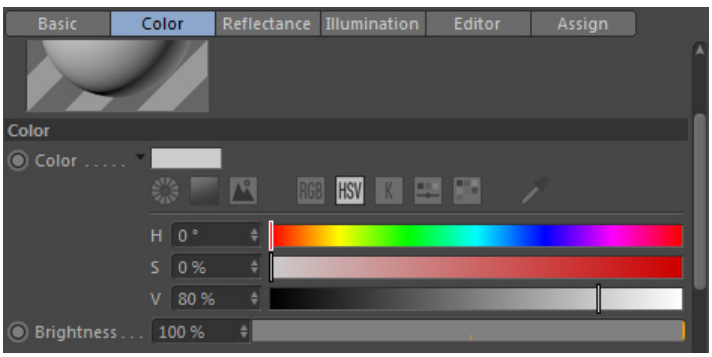

Figure 9-18 *Choosing the browse button in the Attribute Manager*

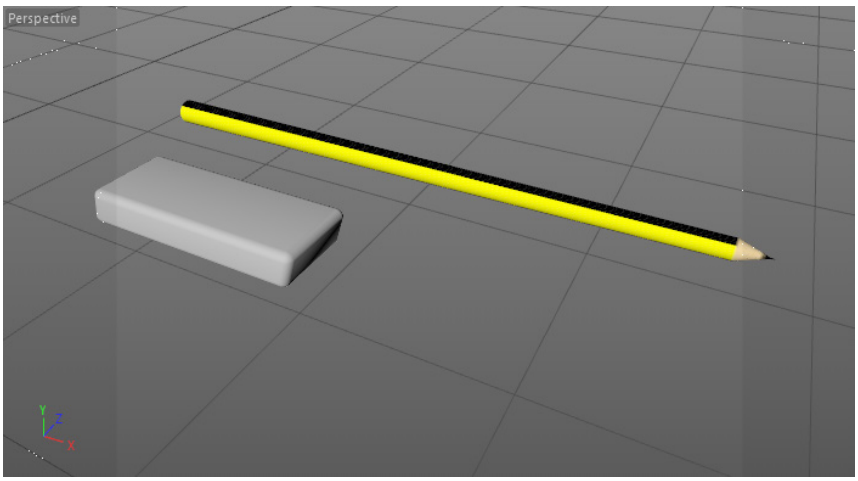

Figure 9-19 *The texture applied to Pencil*

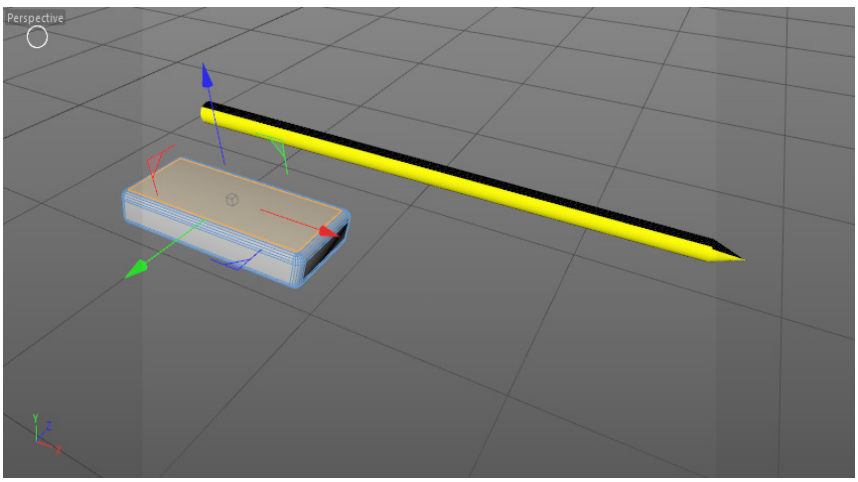

Figure 9-20 *The top polygon of the Eraser selected*

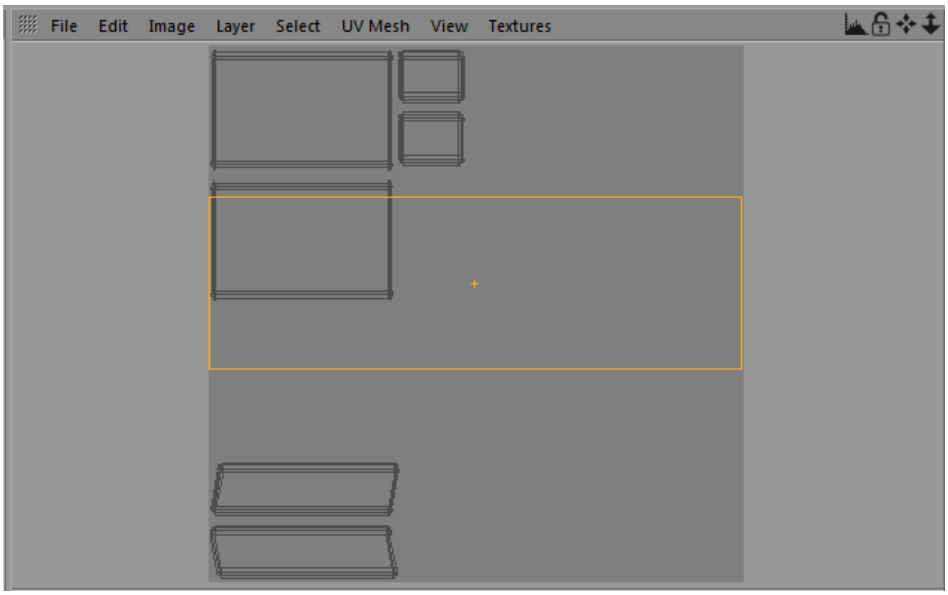

Figure 9-21 *The top polygon aligned in the Texture View*



Figure 9-22 *The text placed inside the white outline*

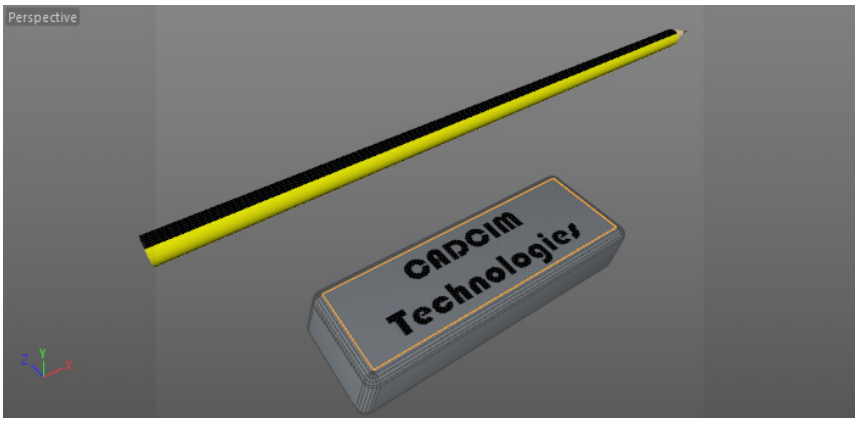

Figure 9-23 *The texture applied to Eraser*



Figure 9-24 *The 3D model after applying body paint*

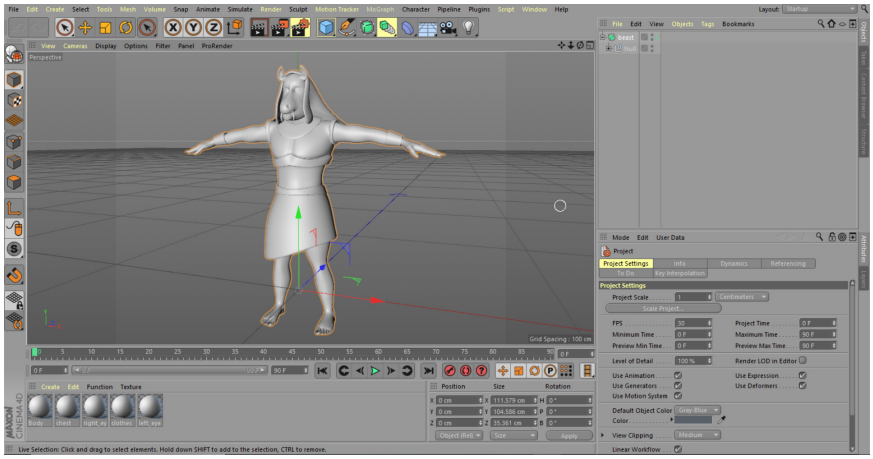

Figure 9-25 *The c09_tut2_start.c4d file*

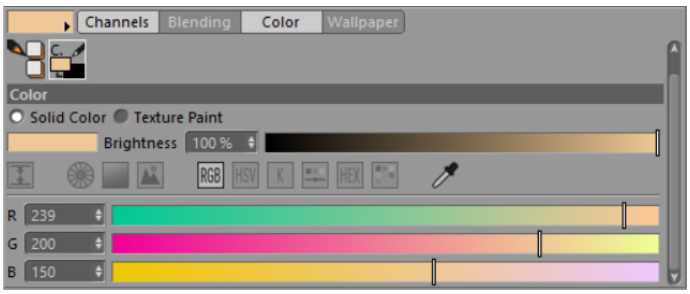

Figure 9-26 *The* ***Color*** *area displayed*

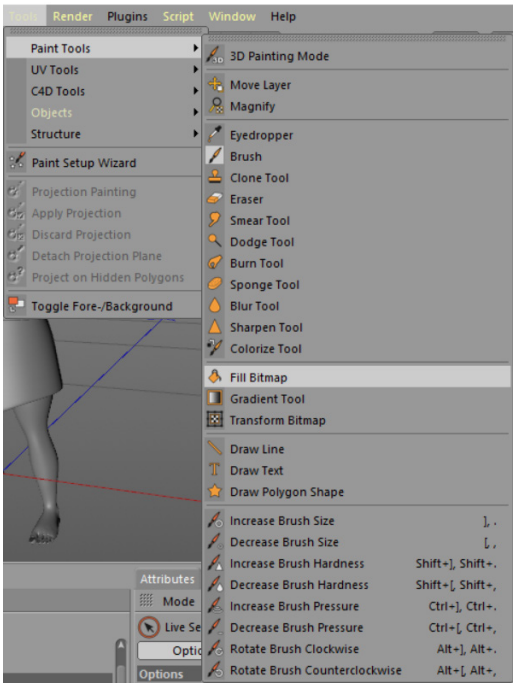

Figure 9-27 *Choosing* ***Paint Tools > Fill Bitmap*** *tool from the* ***Tools*** *menu*



Figure 9-28 *The model filled with the selected color in the Perspective viewport*



Figure 9-29 *The color filled on chest*

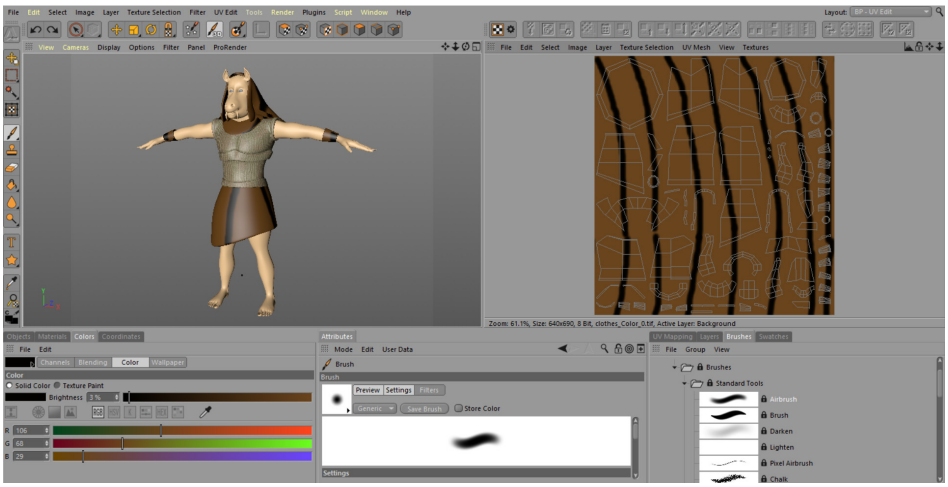

Figure 9-30 *The clothes painted using the* ***Brush*** *tool in the Texture View*

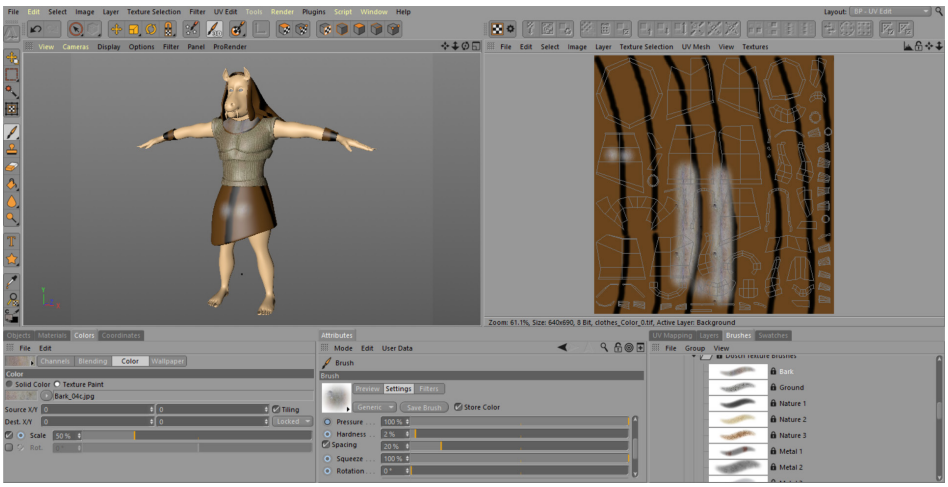

Figure 9-31 *The clothes painted using the* ***Brush*** *tool in the Texture View*

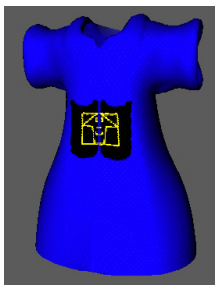

Figure 9-32 *The final output*

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*

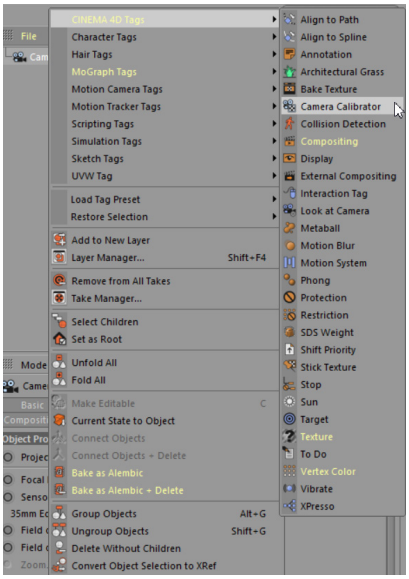

Figure 10-2 *Choosing* ***Camera Calibrator*** *from the shortcut menu*

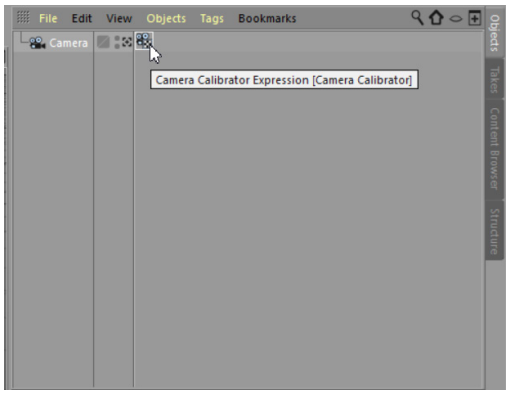

Figure 10-3 *The* ***Camera Calibrator*** *tag added to the Object Manager*

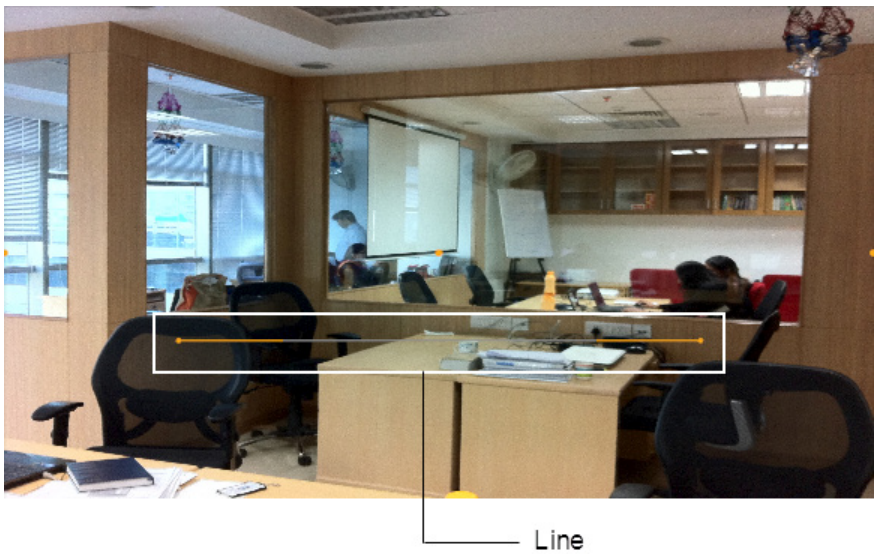

Figure 10-4 *The line created in the Perspective viewport*



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



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

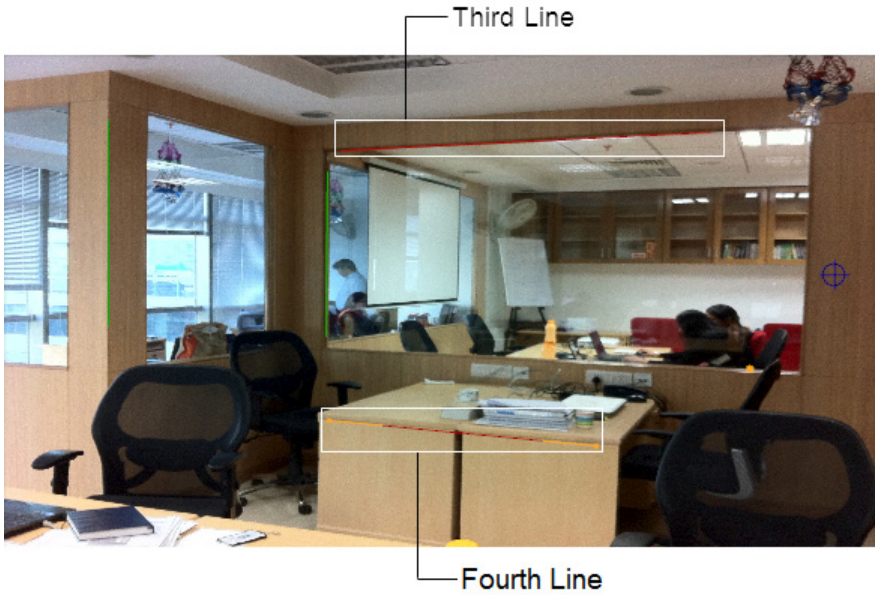

Figure 10-7 *The two red lines representing the X-axis*

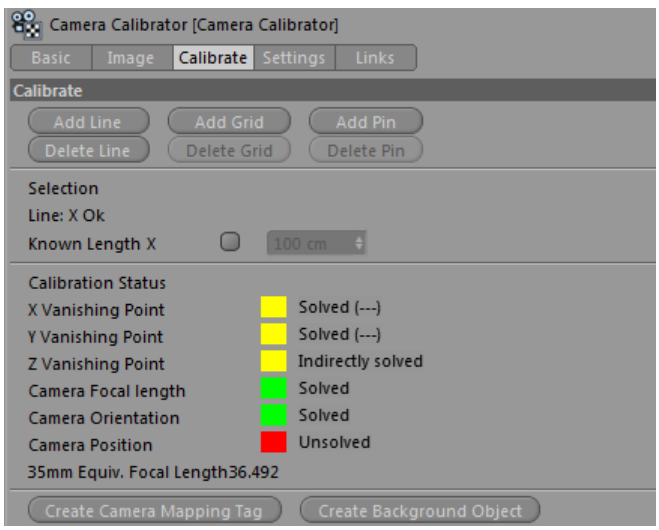

Figure 10-8 *The focal length of the camera solved*



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

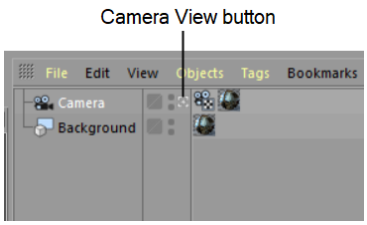

Figure 10-10 *The Camera View button*

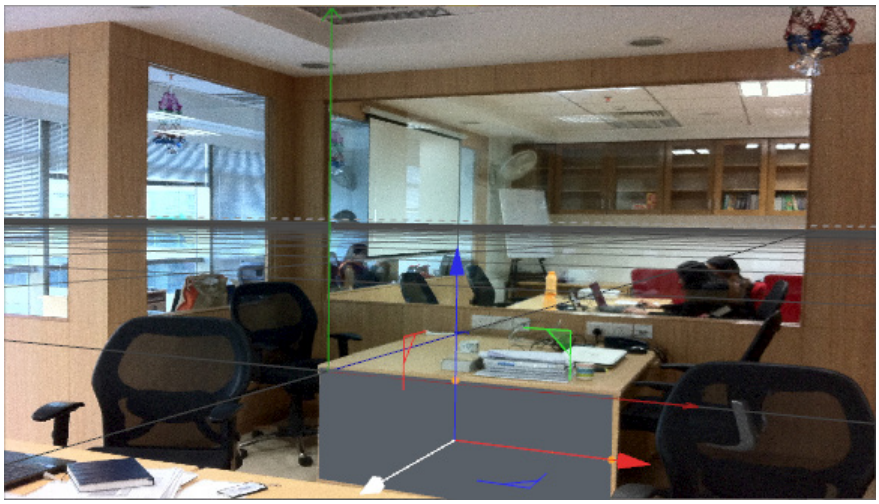

Figure 10-11 *The plane positioned in the scene*



Figure 10-12 *The MoText displayed in the scene*



Figure 10-13 *The rendered scene*



Figure 10-14 *All objects in the Perspective viewport*

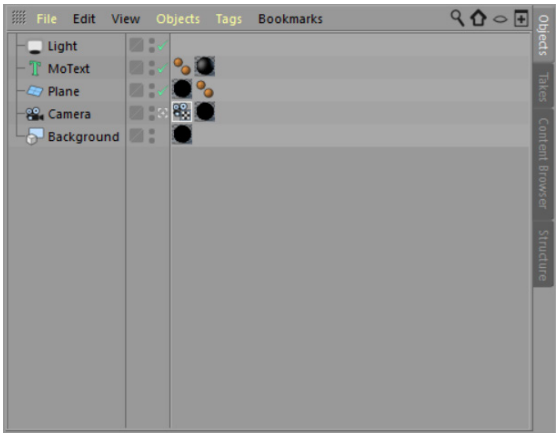

Figure 10-15 *All objects in the Object Manager*



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*

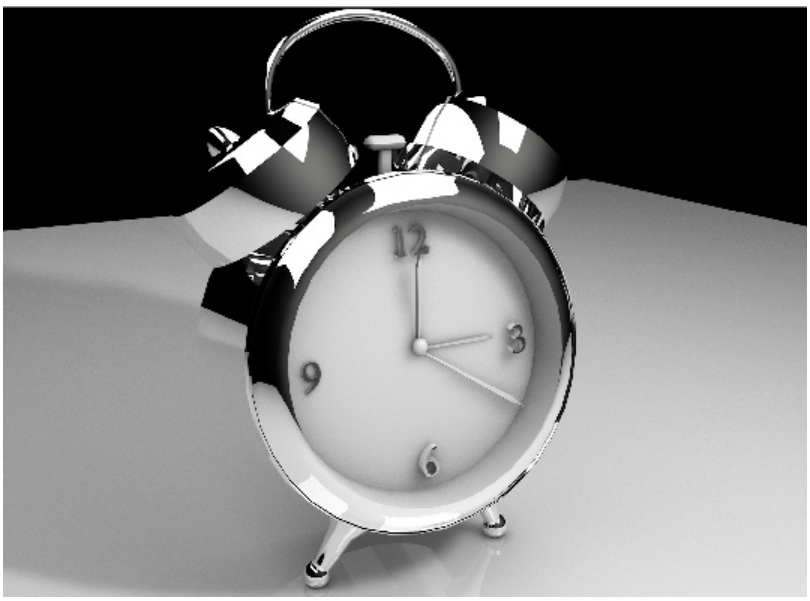

Figure 11-1 *The final rendered table clock*

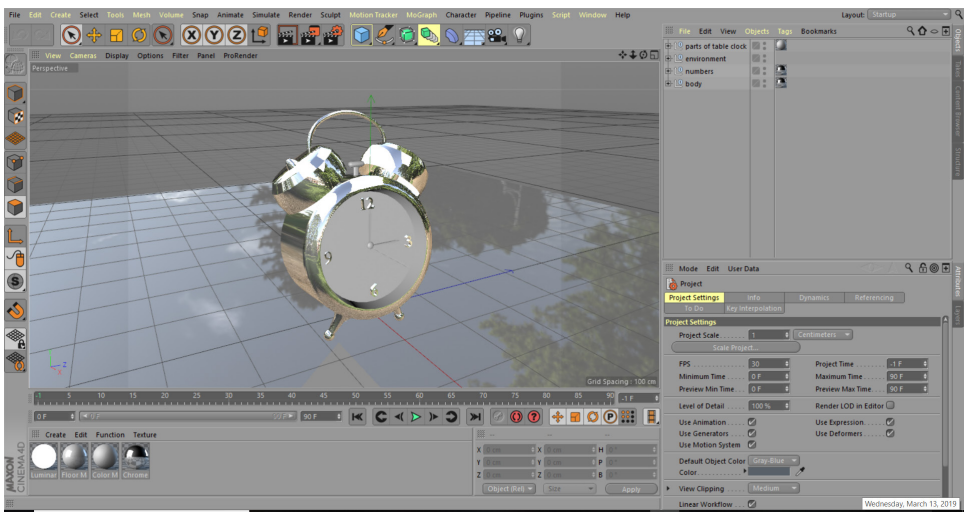

Figure 11-2 *The c11_tut1_start.c4d file*



Figure 11-3 *Displaying the rendered view*

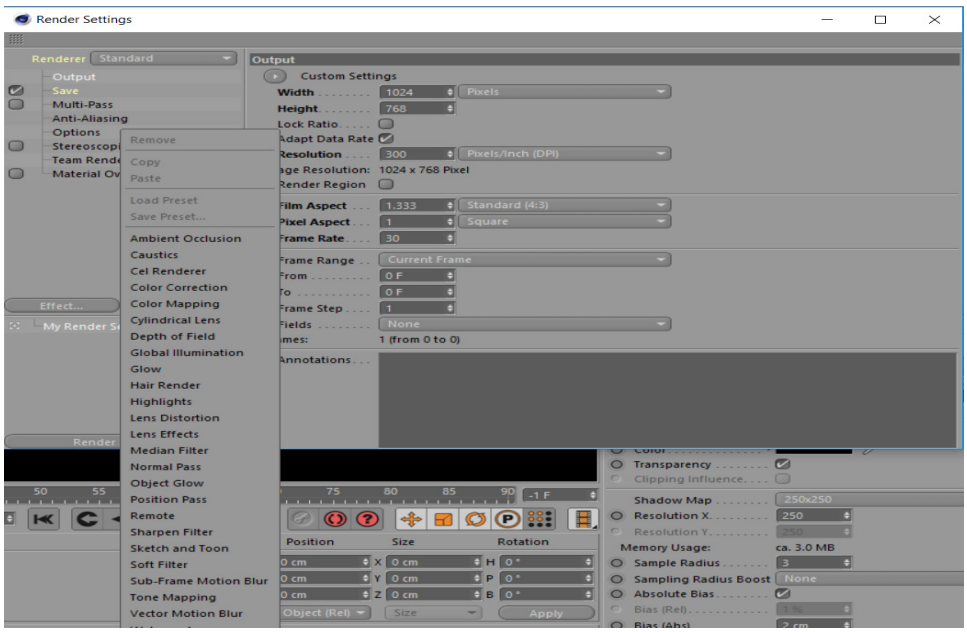

Figure 11-4 *The flyout displayed on choosing the* ***Effect*** *button*

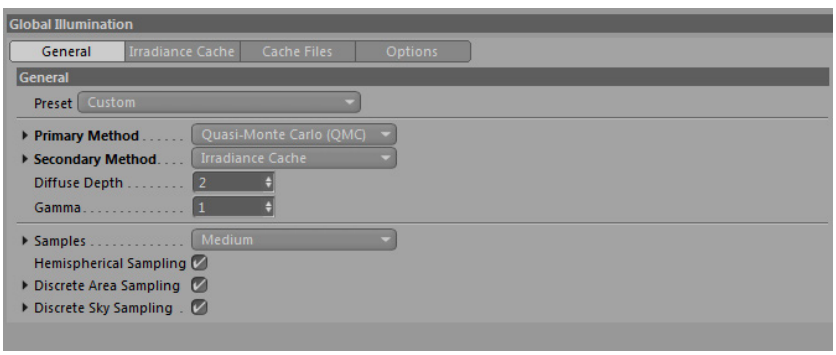

Figure 11-5 *The* ***Global Illumination*** *area*



Figure 11-6 *The rendered clock*



Figure 11-7 *The rendered clock*

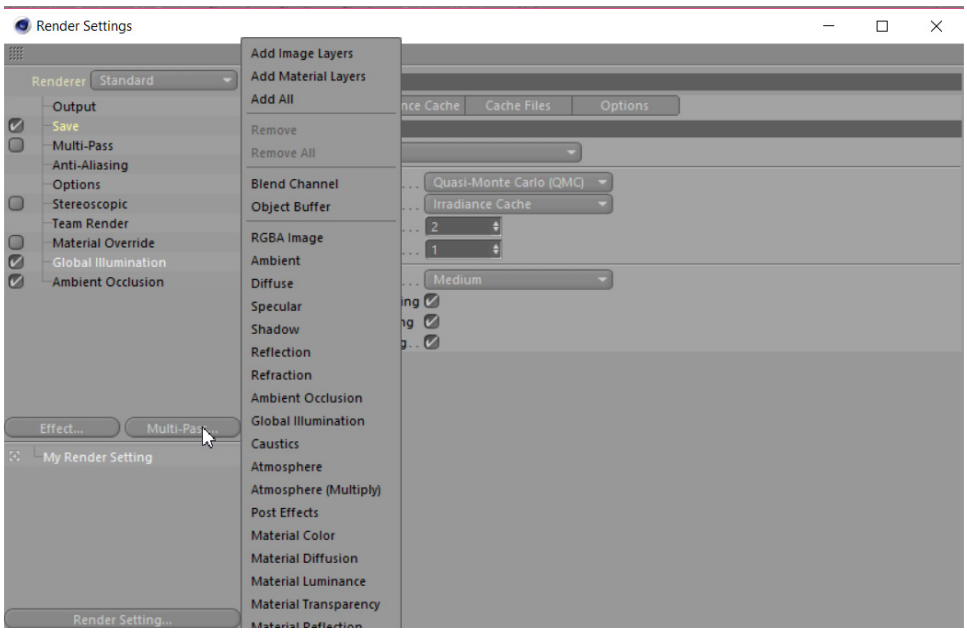

Figure 11-8 *The flyout displayed on choosing the* ***Multi-Pass*** *button*

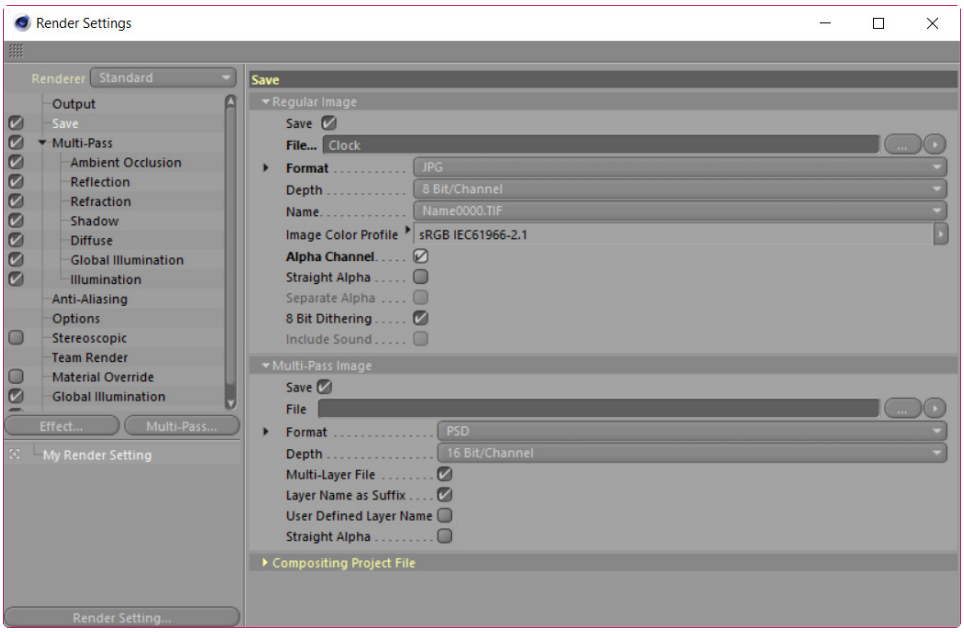

Figure 11-9 *Selecting the* ***Alpha Channel*** *check box in the* ***Render Settings*** *window*

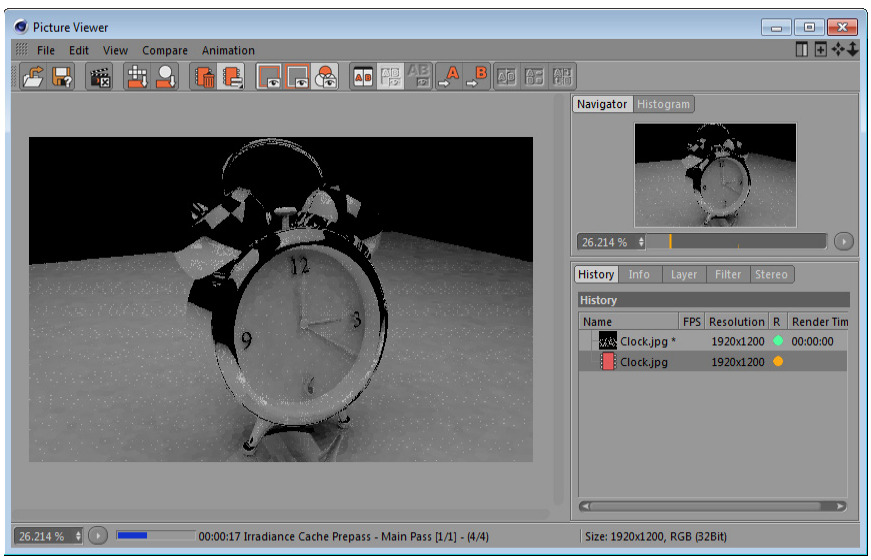

Figure 11-10 *The rendering process in the* ***Picture Viewer*** *window*

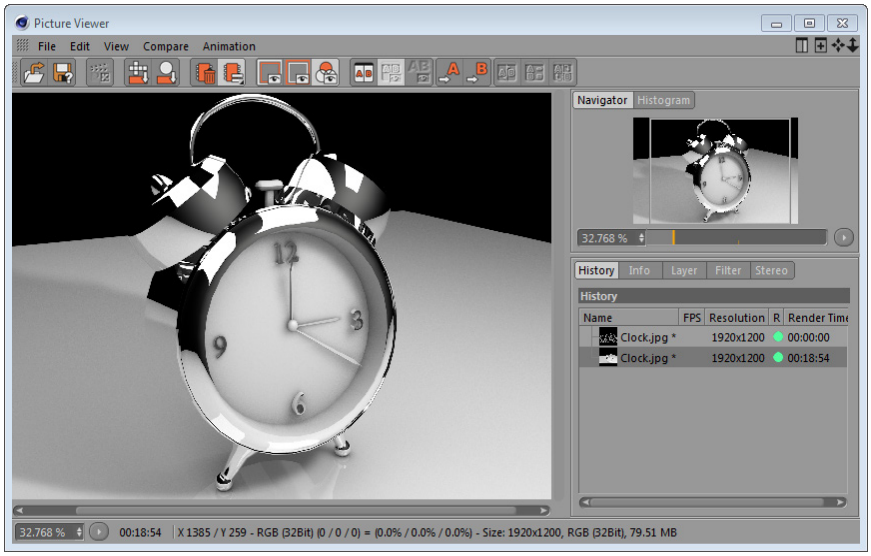

Figure 11-11 *The render passes displayed in the* ***Picture Viewer*** *window*

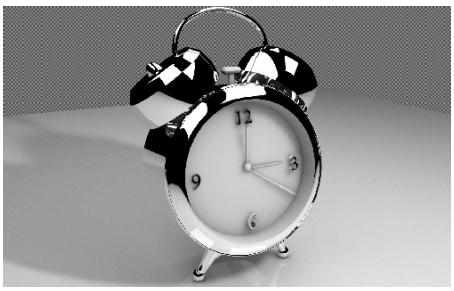

Figure 11-12 *Displaying the* ***Alpha*** *pass in the* ***Picture Viewer*** *window*



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

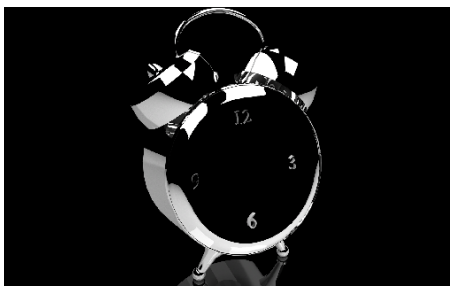

Figure 11-14 *The* ***Reflection*** *pass displayed in the* ***Picture Viewer*** *window*

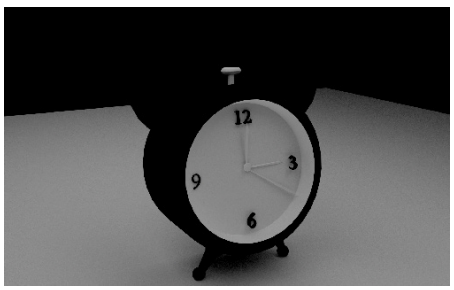

Figure 11-15 *The* ***Global Illumination*** *pass displayed in the* ***Picture Viewer*** *window*



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

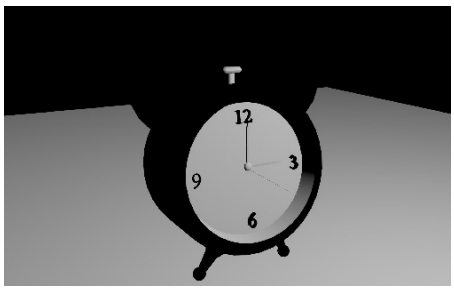

Figure 11-17 *The* ***Diffuse*** *pass displayed in the* ***Picture Viewer*** *window*

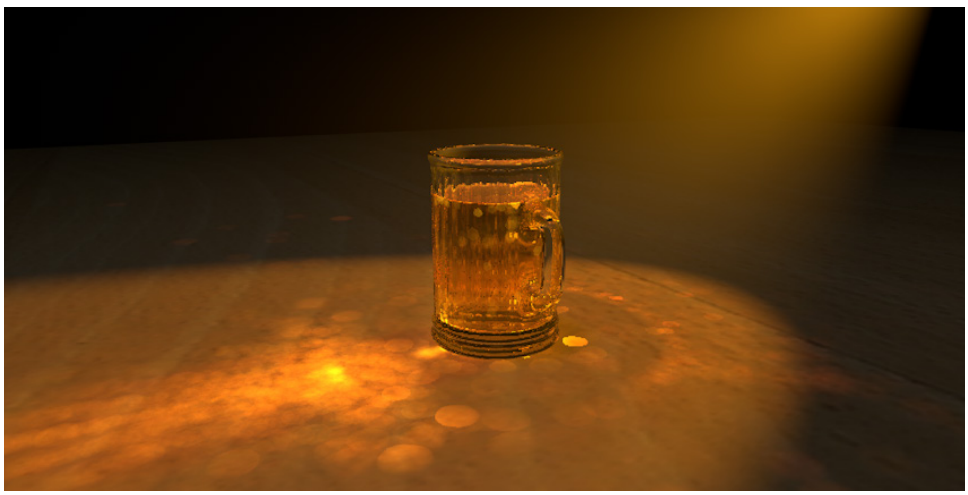

Figure 11-18 *The render of the beer mug*

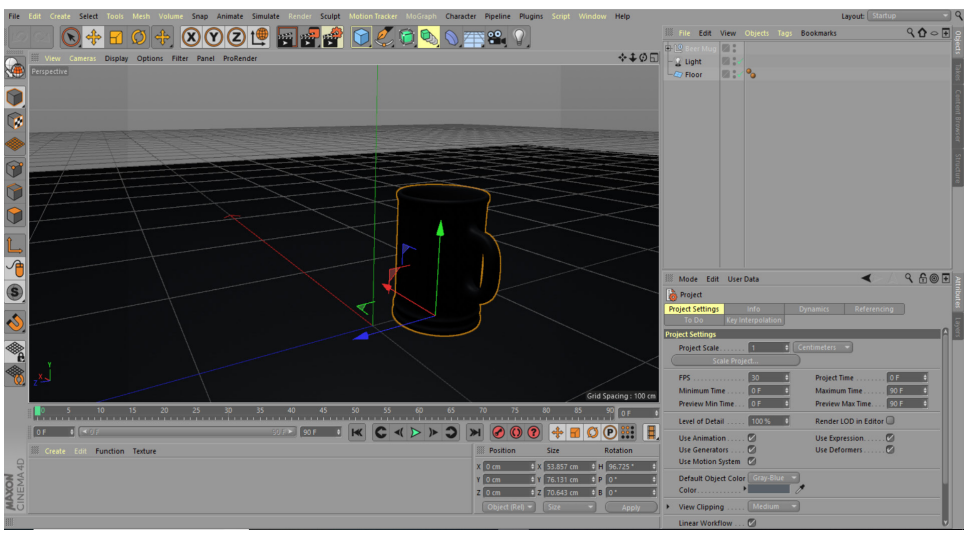

Figure 11-19 *The c11_tut2_start.c4d file*

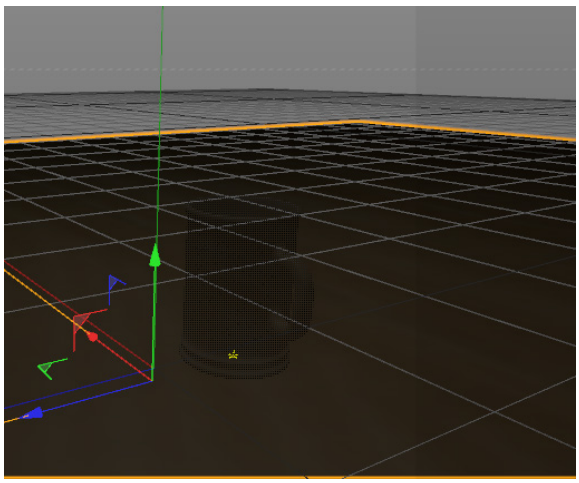

Figure 11-20 *The floor texture applied*

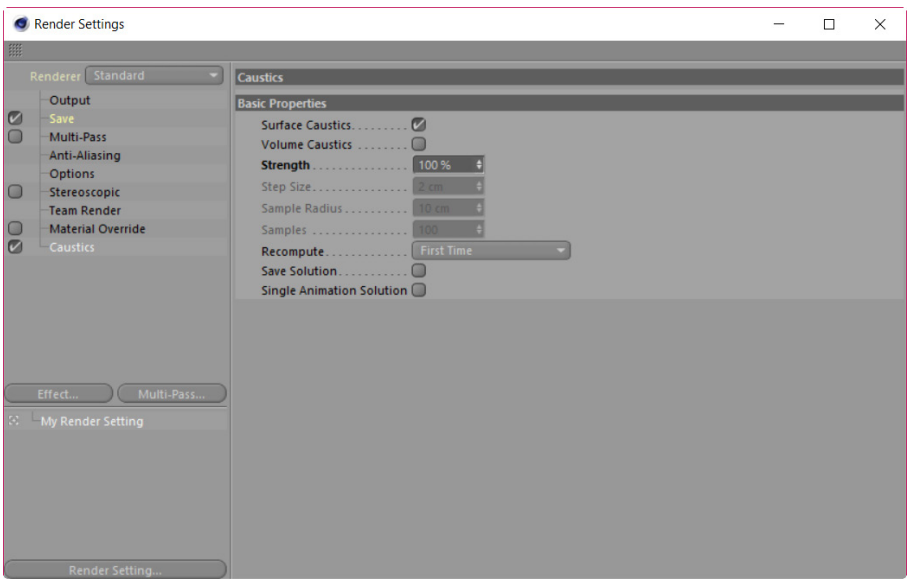

Figure 11-21 *The* ***Caustics*** *area in the* ***Render Settings*** *window*

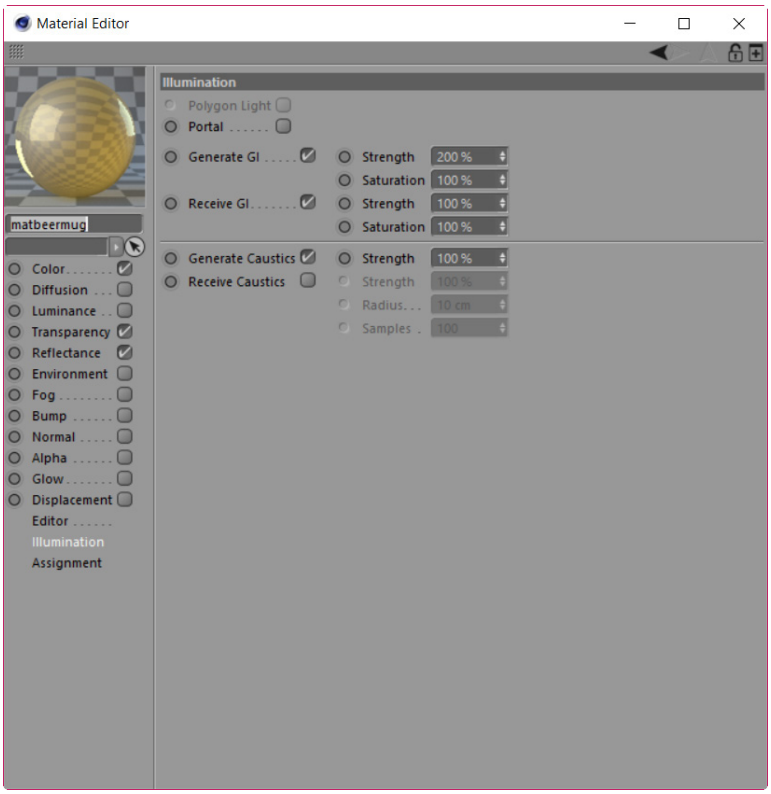

Figure 11-22 *The* ***Illumination*** *area displayed in the* ***Material Editor*** *window*



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*

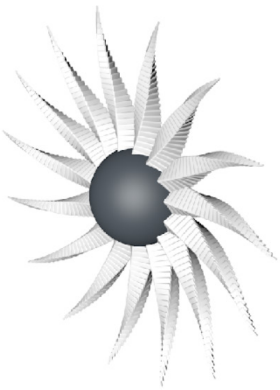

Figure 12-1 *The abstract model to be created*

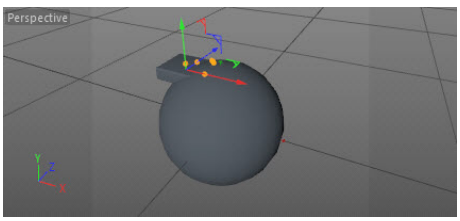

Figure 12-2 *Cube positioned in the Perspective viewport*

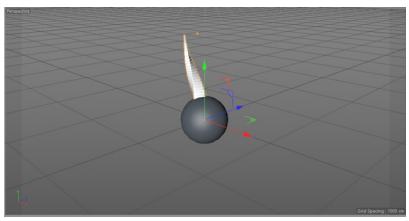

Figure 12-3 *Cloner displayed in the Perspective viewport*

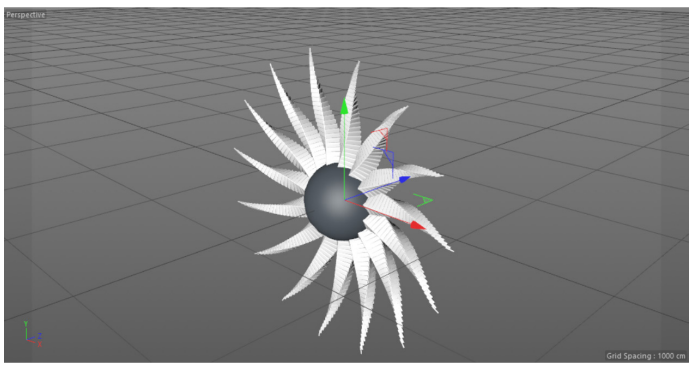

Figure 12-4 *Cloner.1 displayed in the Perspective viewport*

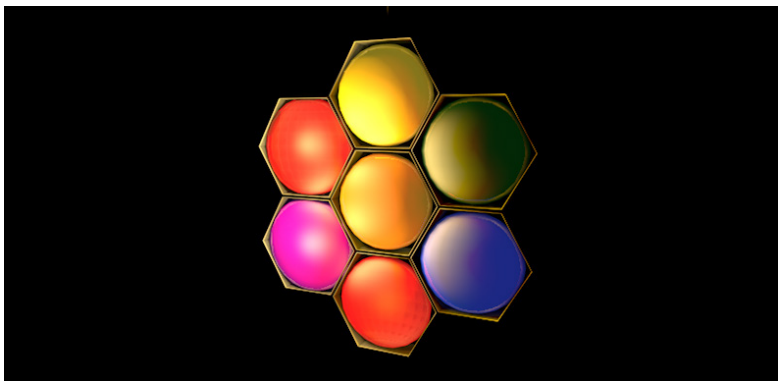

Figure 12-5 *The disco light effect at frame 60*

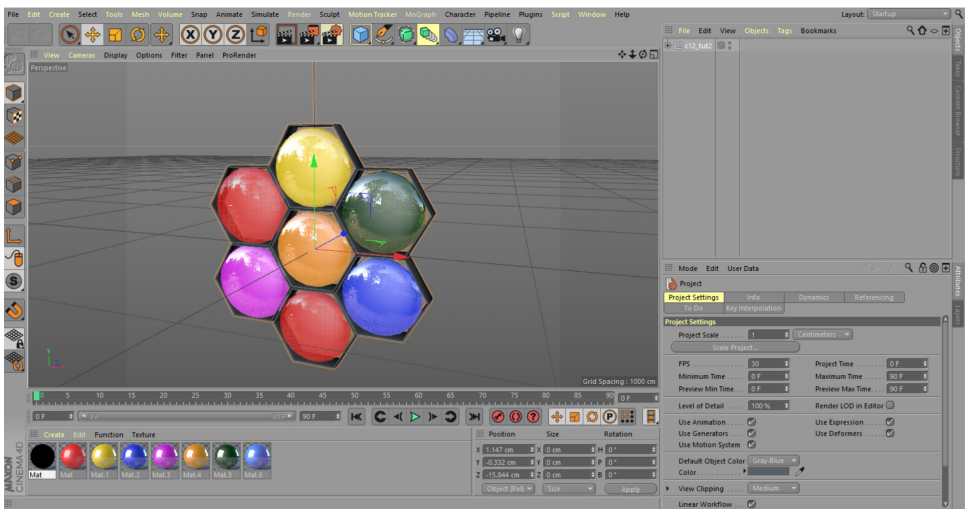

Figure 12-6 *The c12_tut2_start.c4d file*

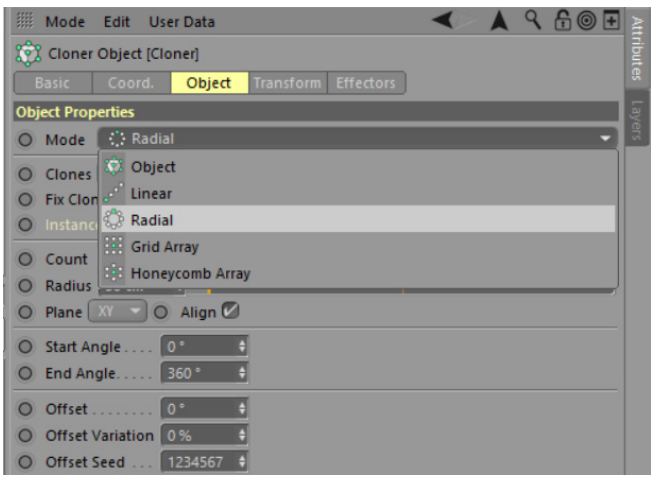

Figure 12-7 *Selecting* ***Radial*** *from the* ***Mode*** *drop-down list*

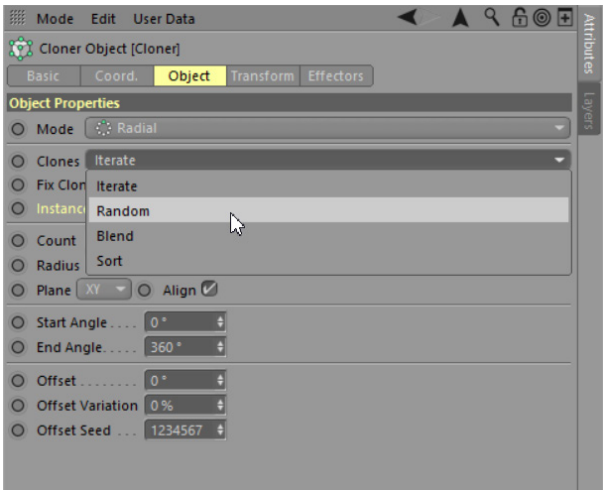

Figure 12-8 *Selecting* ***Random*** *from the* ***Clones*** *drop-down list*

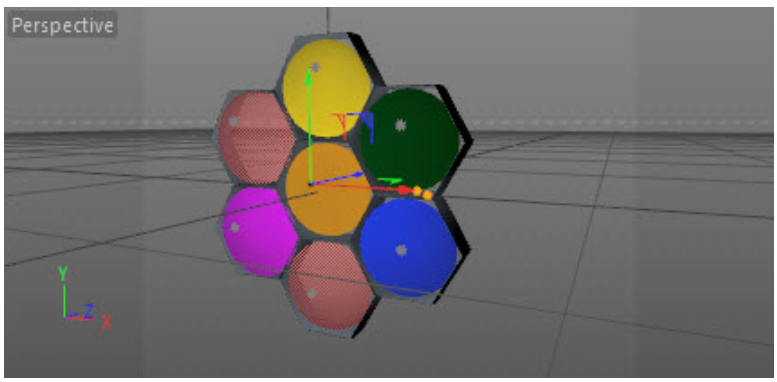

Figure 12-9 *The clones of Light displayed in the Perspective viewport*

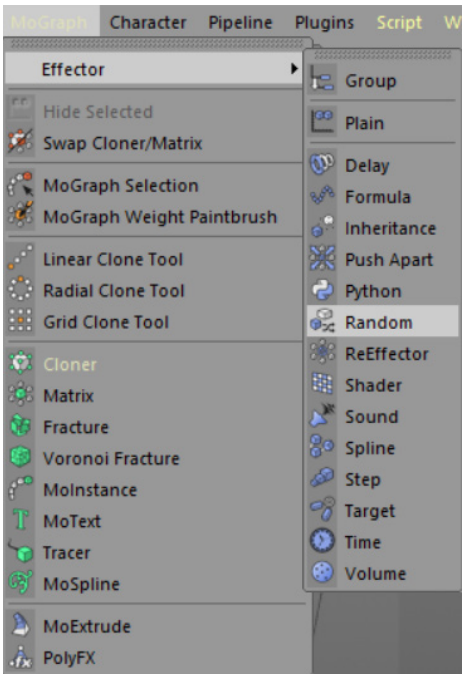

Figure 12-10 *Choosing* ***Random*** *from the cascading menu*

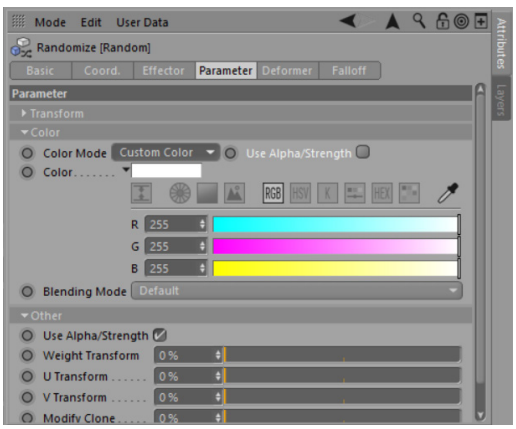

Figure 12-11 *The* ***Custom Color*** *option from the* ***Color Mode*** *drop-down list*

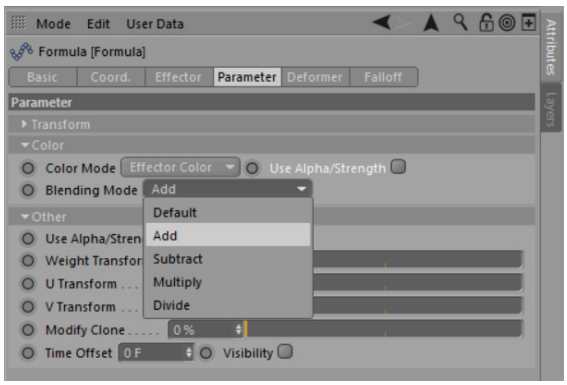

Figure 12-12 *Selecting the* ***Add*** *option from the* ***Blending Mode*** *drop-down list*

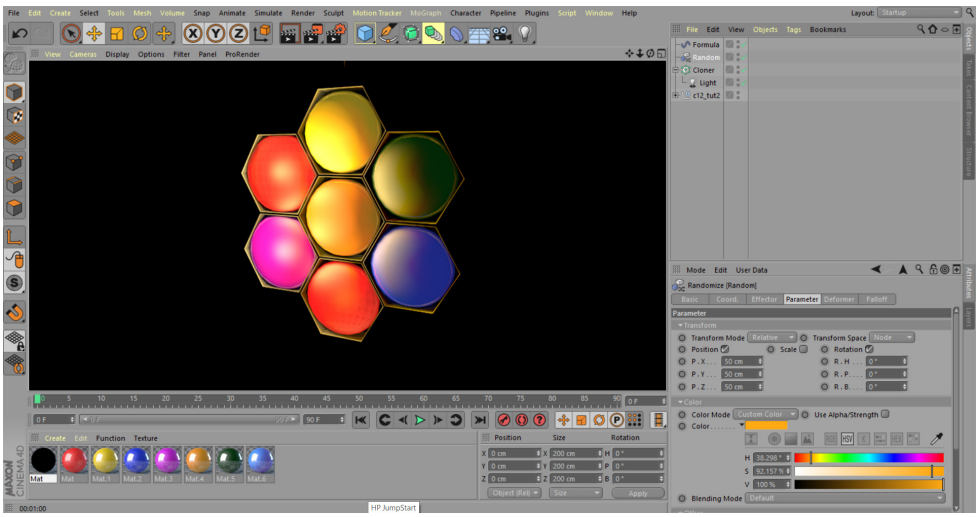

Figure 12-13 *The rendered view at the current frame*



Figure 12-14 *The shattering effect at frame 81*

t

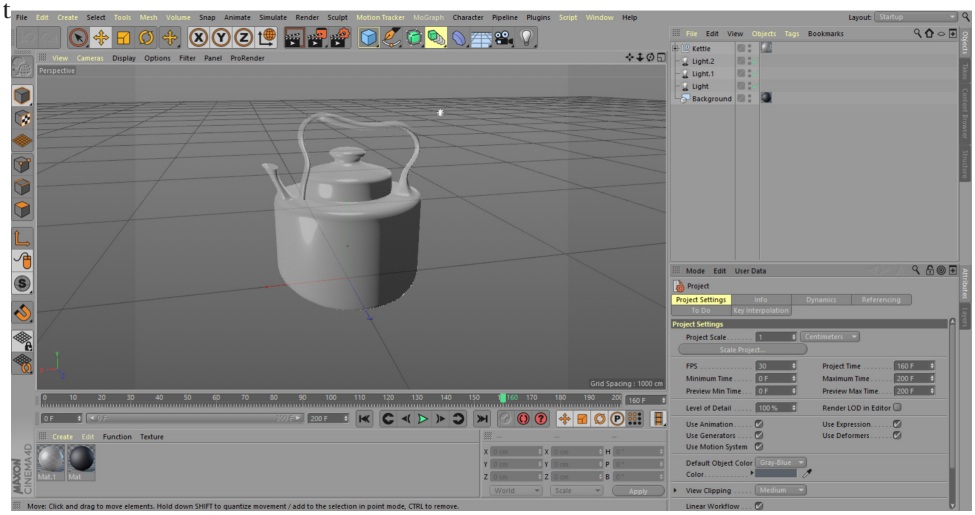

Figure 12-15 *The c12_tut3_start.c4d file*

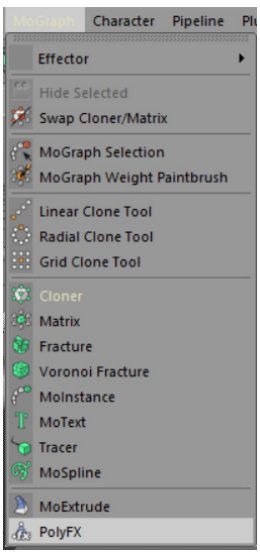

Figure 12-16 *Choosing* ***PolyFX*** *from the main menu*

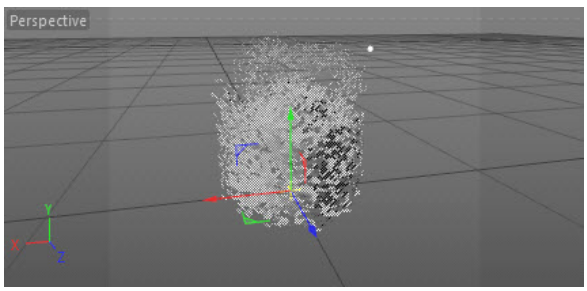

Figure 12-17 *The fragmented Kettle in the Perspective viewport*

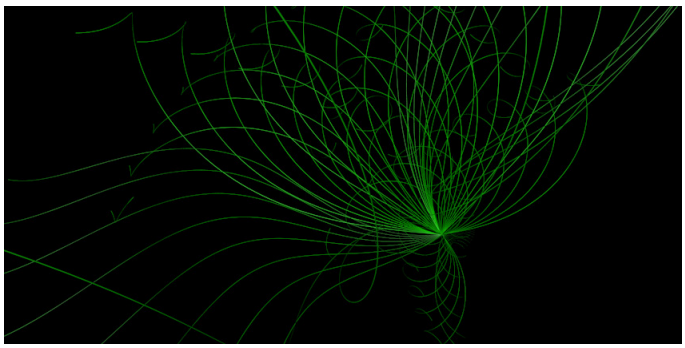

Figure 12-18 *The abstract animation at frame 0*

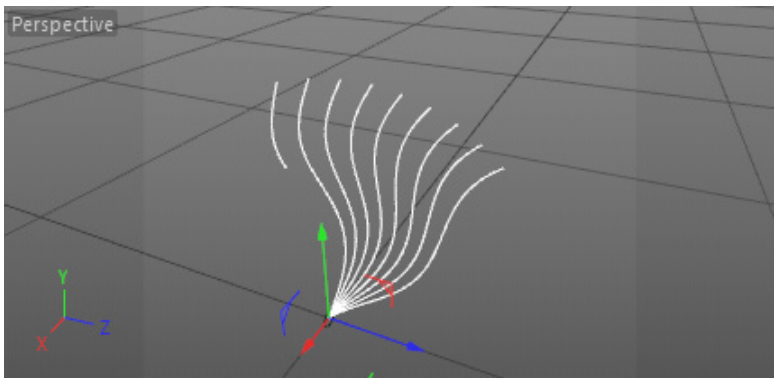

Figure 12-19 *The MoSpline displayed in the Perspective viewport*

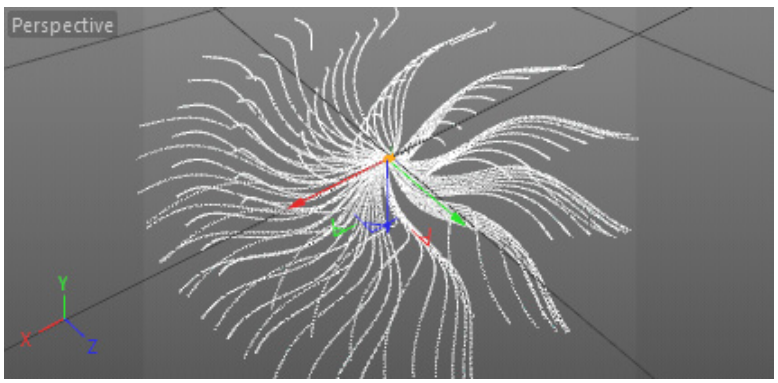

Figure 12-20 *The clones displayed in the Perspective viewport*

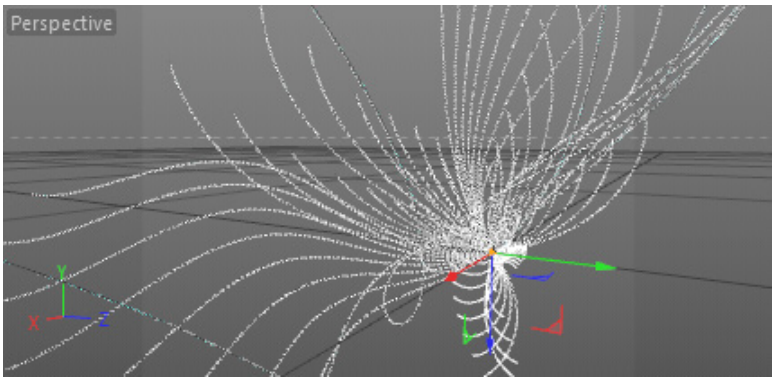

Figure 12-21 *The clones displayed in the viewport*

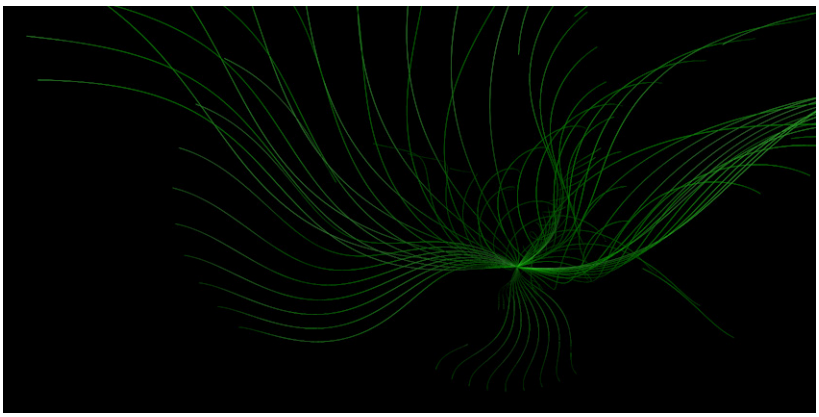

Figure 12-22 *The rendered image at frame 48*

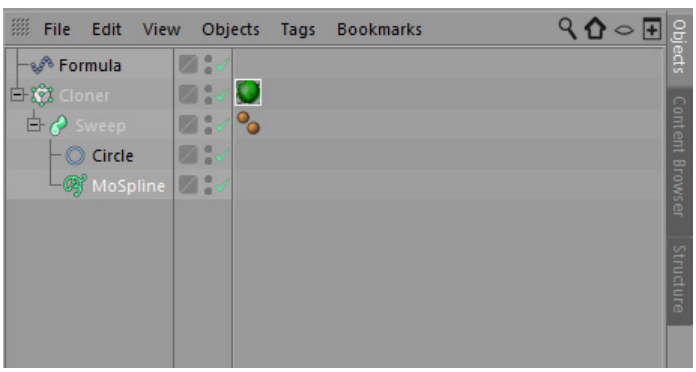

Figure 12-23 *The objects in the Object Manager*

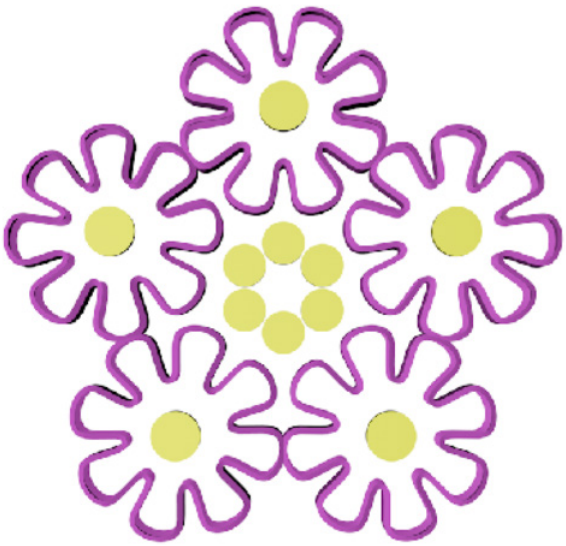

Figure 12-24 *The abstract model*

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*

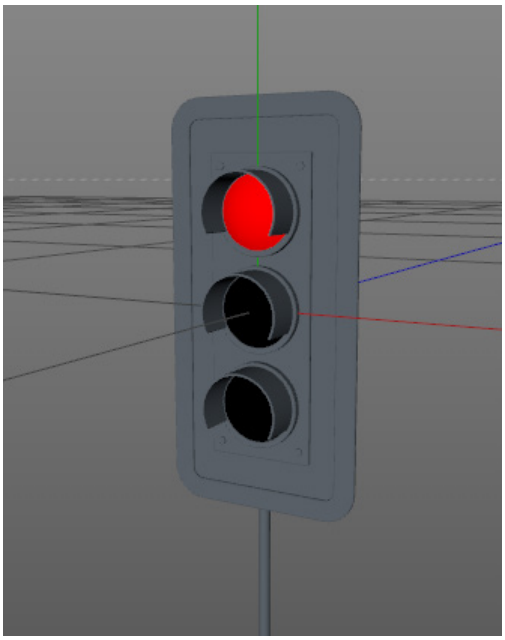

Figure 13-1 *The traffic signal with the red light on*

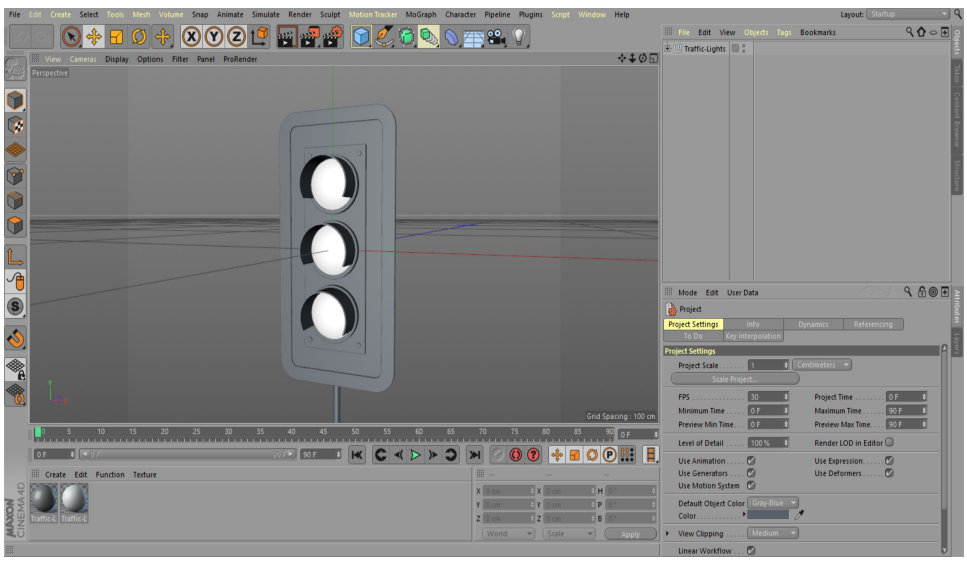

Figure 13-2 *The c13_tut1_start.c4d file*

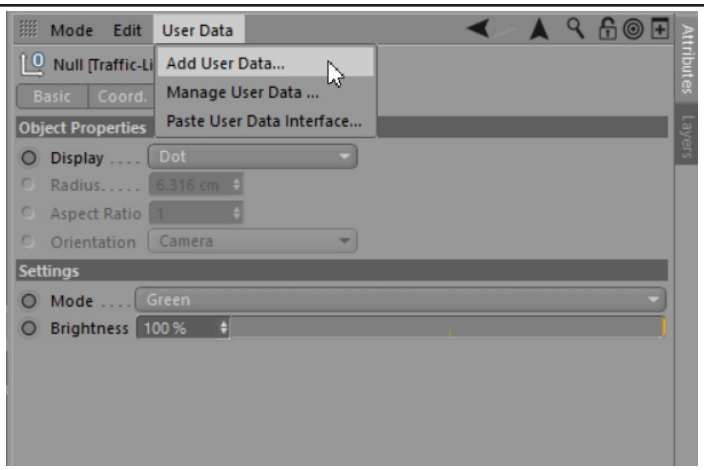

Figure 13-3 *Choosing* ***Add User Data*** *from the menu in the Attribute Manager*

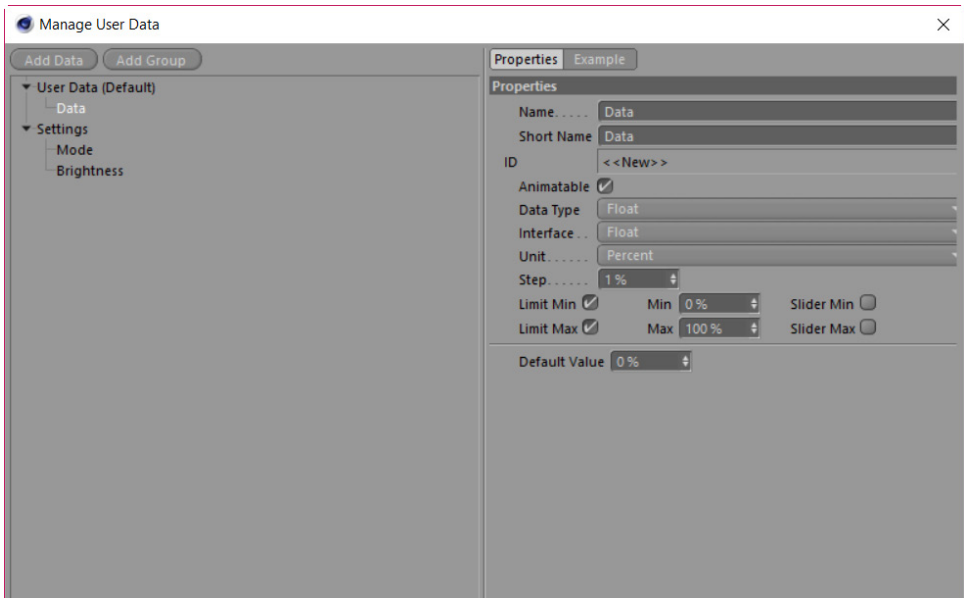

Figure 13-4 *The* ***Manage User Data*** *dialog box*

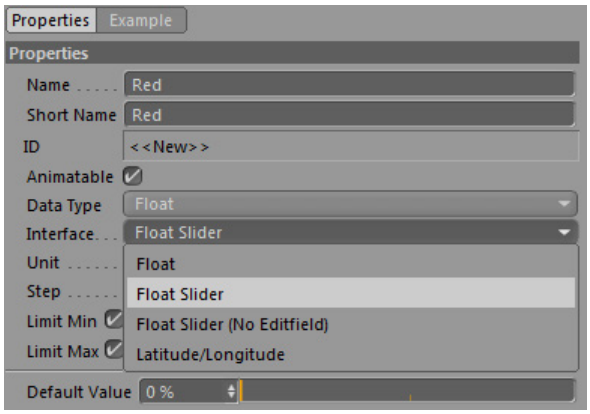

Figure 13-5 *Selecting* ***Float Slider*** *from the* ***Interface*** *drop-down list*

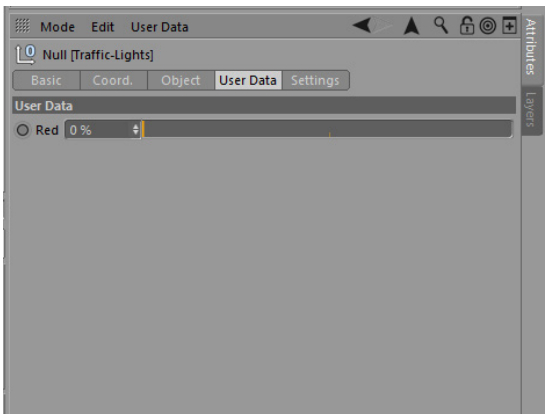

Figure 13-6 *The* ***Red*** *spinner added to the* ***User Data*** *area in the Attribute Manager*

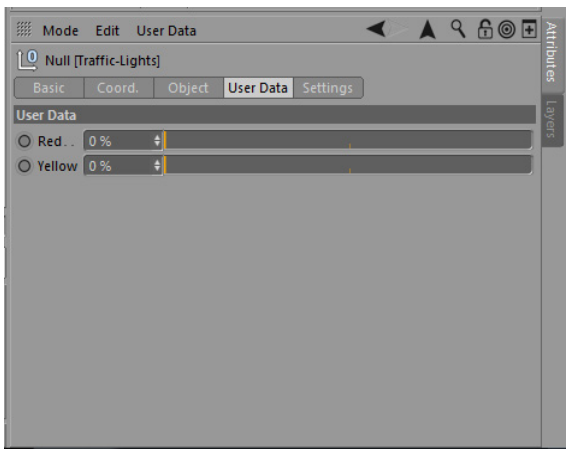

Figure 13-7 *The* ***Yellow*** *spinner added to the* ***User Data*** *area in the Attribute Manager*

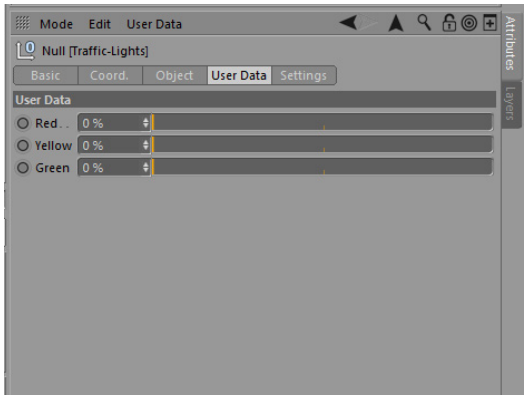

Figure 13-8 *The* ***Green*** *spinner added to the* ***User Data*** *area in the Attribute Manager*

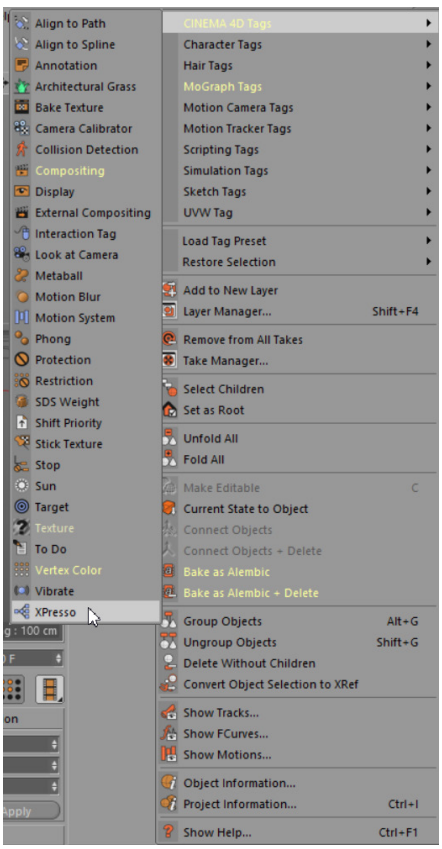

Figure 13-9 *Choosing* ***XPresso*** *from the shortcut menu*

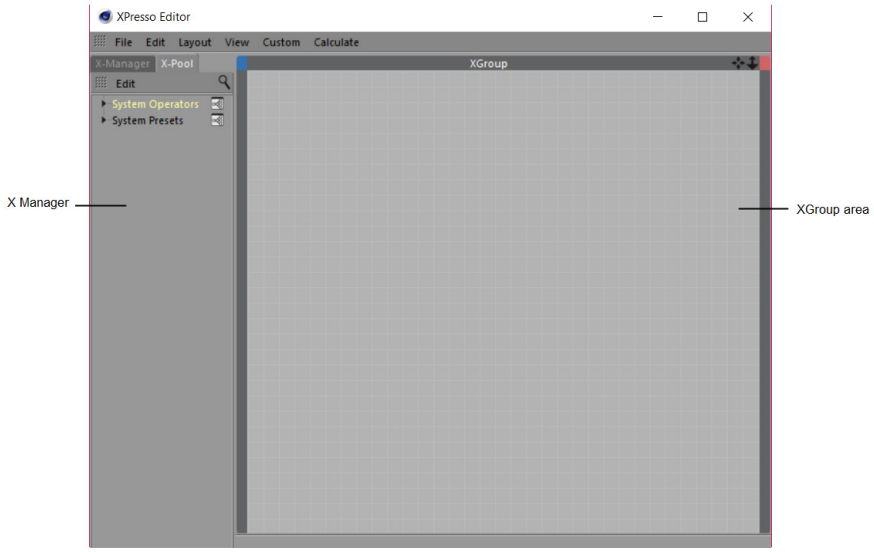

Figure 13-10 *The* ***XPresso Editor***

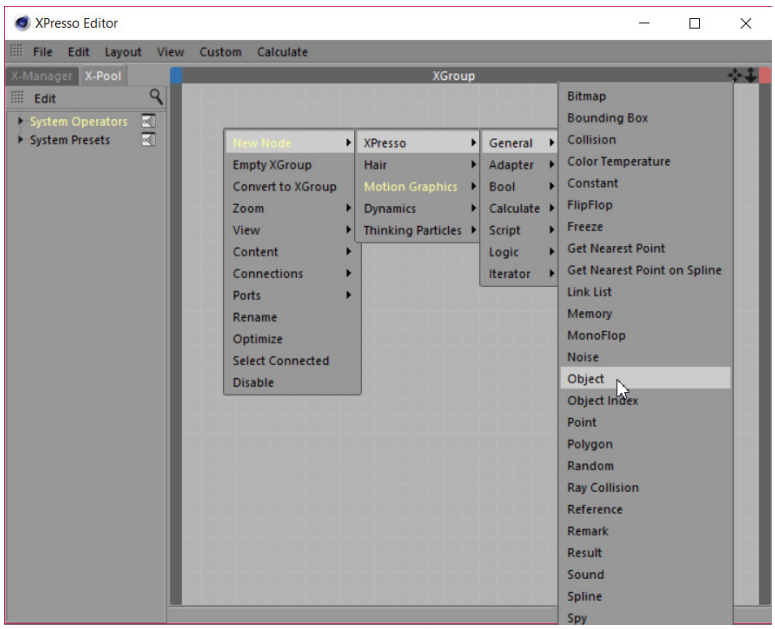

Figure 13-11 *Choosing* ***Object*** *from the shortcut menu*

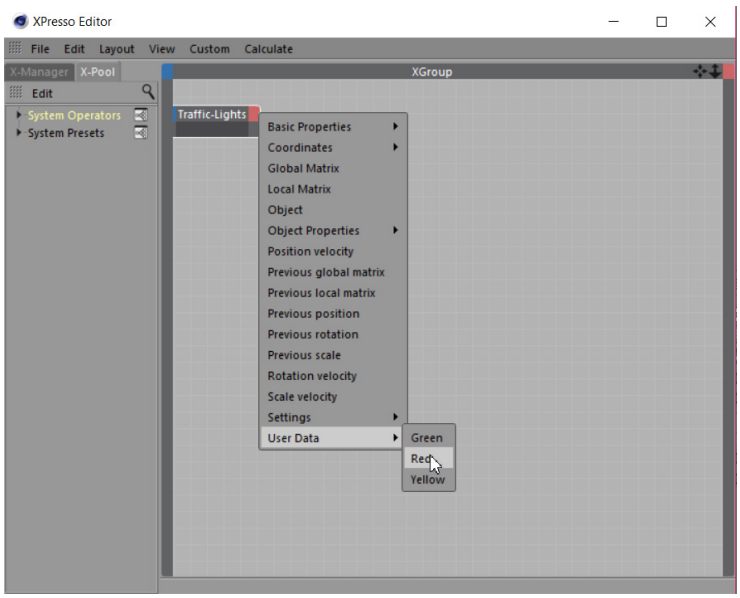

Figure 13-12 *Choosing* ***Red*** *from the flyout in the* ***XPresso Editor***

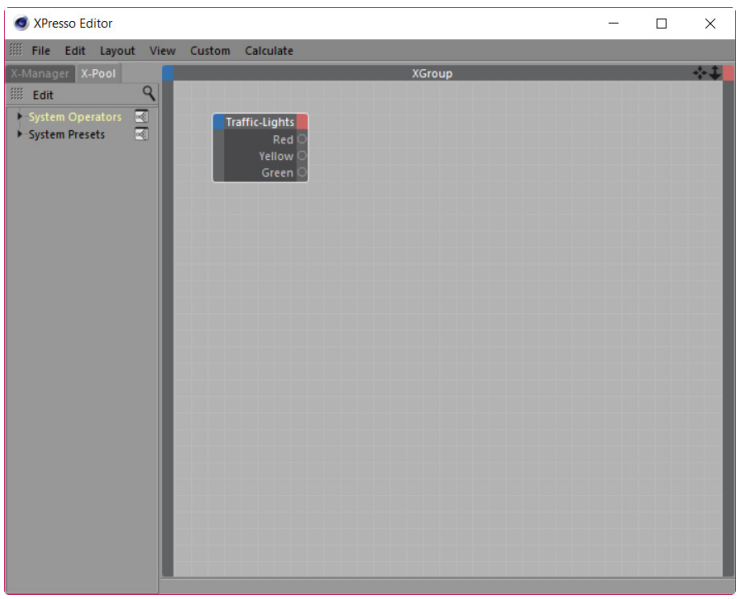

Figure 13-13 *The* ***Red***, ***Yellow***, *and* ***Green*** *output ports added to the* ***Traffic-Lights*** *node*

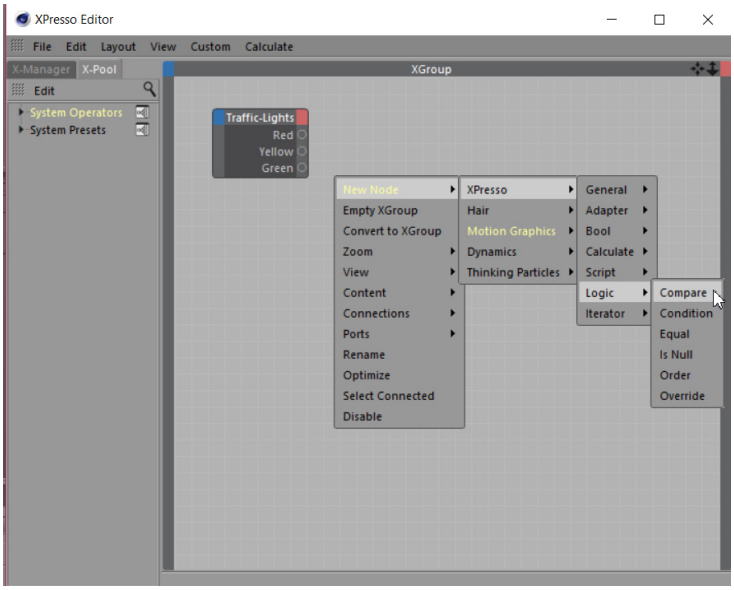

Figure 13-14 *Choosing the* ***Compare*** *option from the shortcut menu in the* ***XPresso Editor***

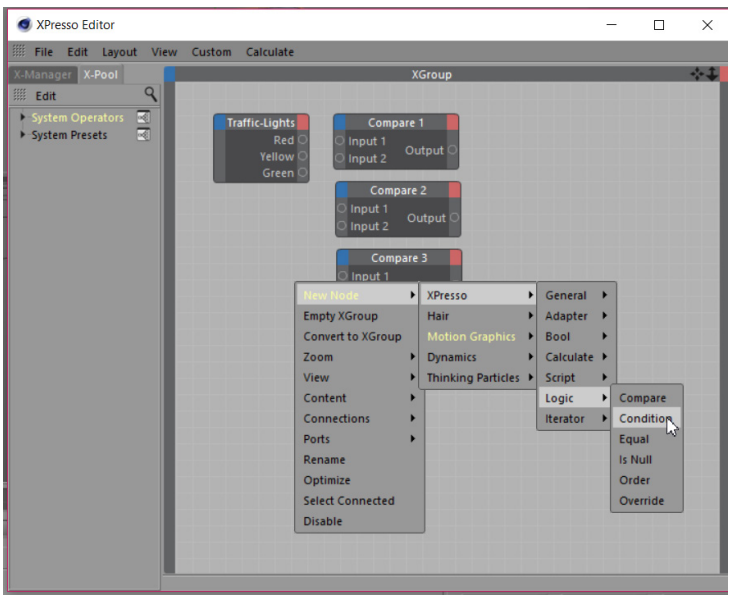

Figure 13-15 *Choosing the* ***Condition*** *option from the shortcut menu in the* ***XPresso Editor***

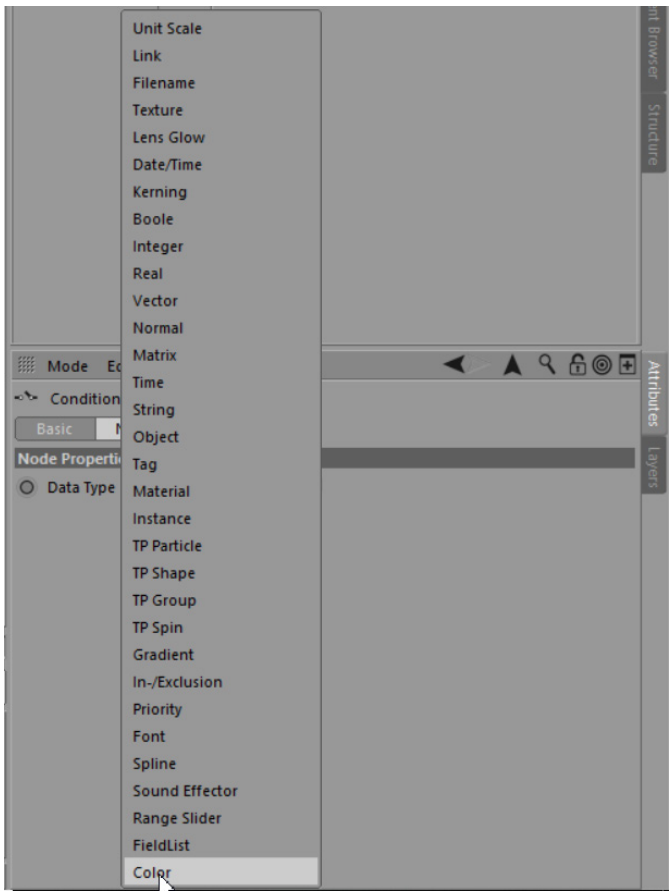

Figure 13-16 *Selecting* ***Color*** *from the* ***Data Type*** *drop-down list in the* ***Node Properties*** *area*

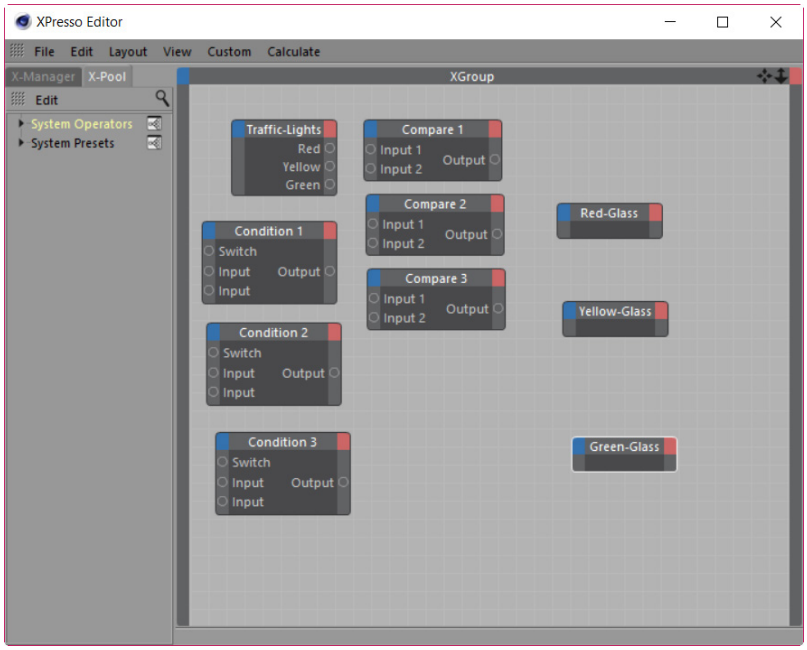

Figure 13-17 *The* ***Red-Glass***, ***Yellow-Glass***, *and* ***Green-Glass*** *nodes added in the* ***XPresso Editor***

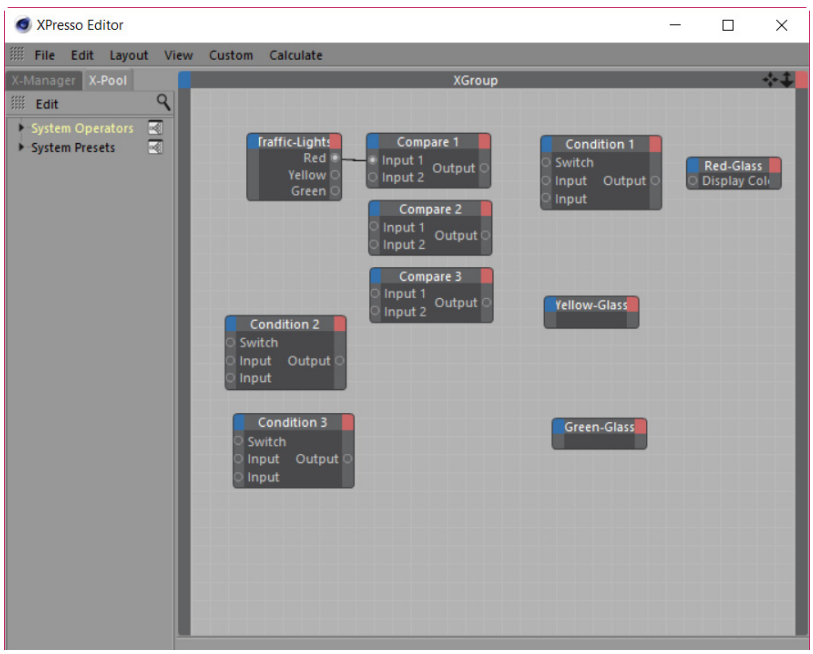

Figure 13-18 *Connection established between the* ***Red*** *output port of the* ***Traffic-Lights*** *and* ***Compare 1*** *nodes*

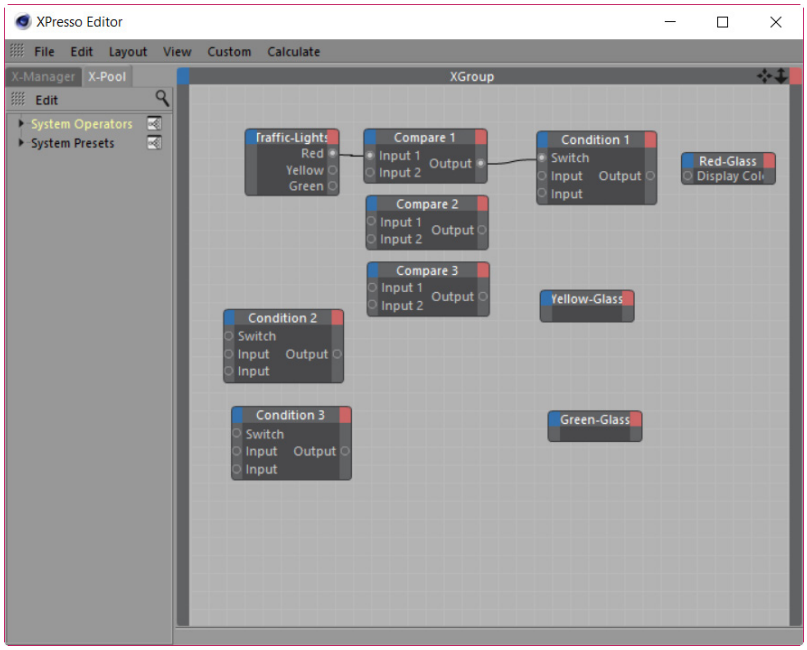

Figure 13-19 *Connection established between the* ***Compare 1*** *and* ***Condition 1*** *nodes*

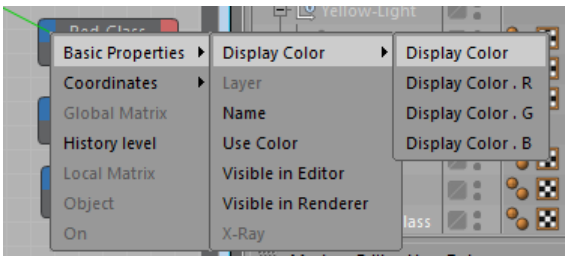

Figure 13-20 *Choosing* ***Display Color*** *from the flyout in the* ***XPresso Editor***

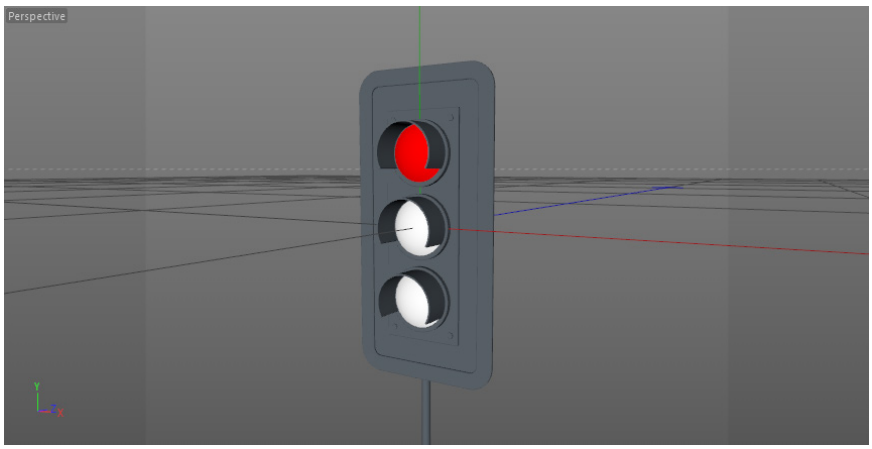

Figure 13-21 *The red light activated in the Perspective viewport*

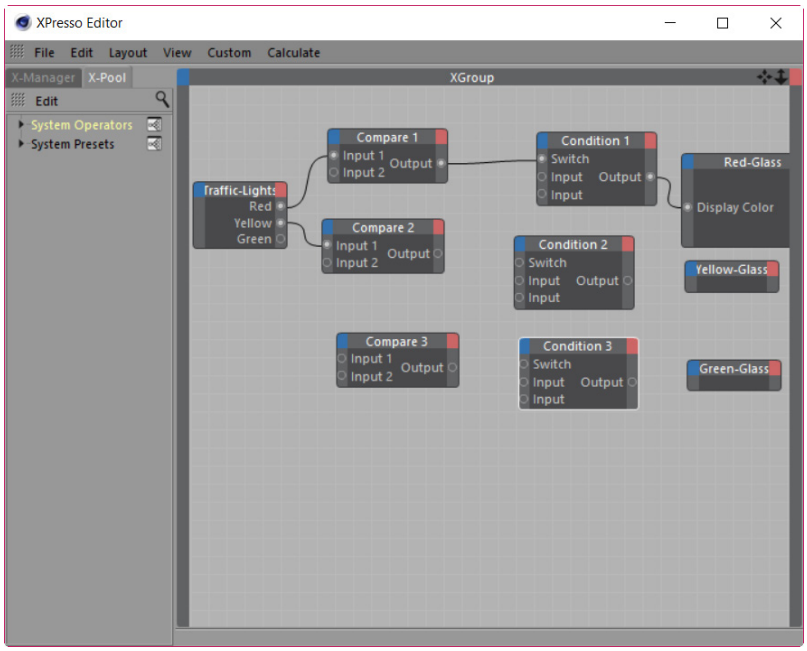

Figure 13-22 *Connection established between the* ***Yellow*** *output port of the* ***Traffic -Lights*** *and* ***Compare 2*** *nodes*

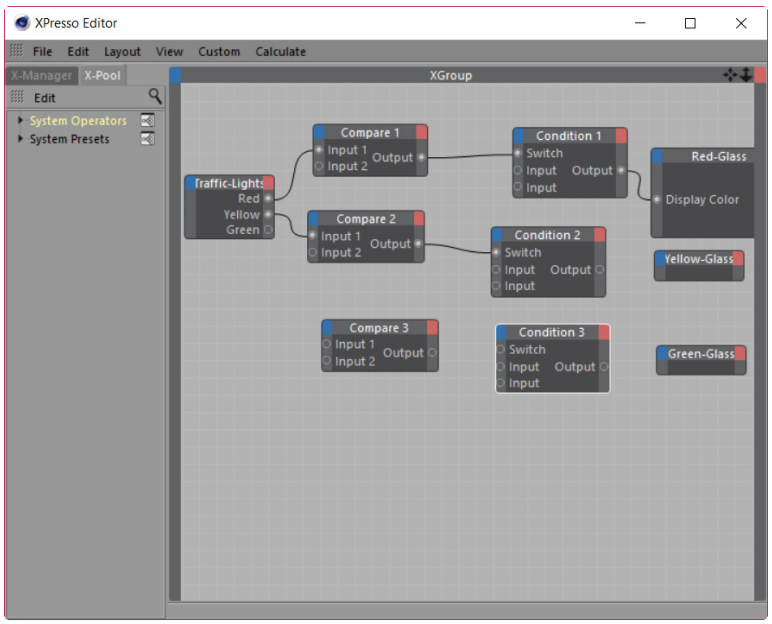

Figure 13-23 *Connection established between the* ***Compare 2*** *and* ***Condition 2*** *nodes*

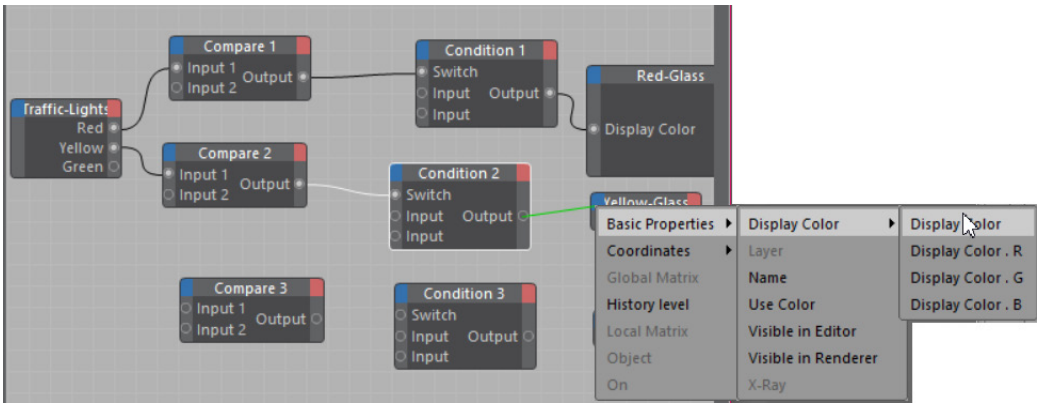

Figure 13-24 *Choosing* ***Display Color*** *from the flyout in the* ***XPresso Editor***

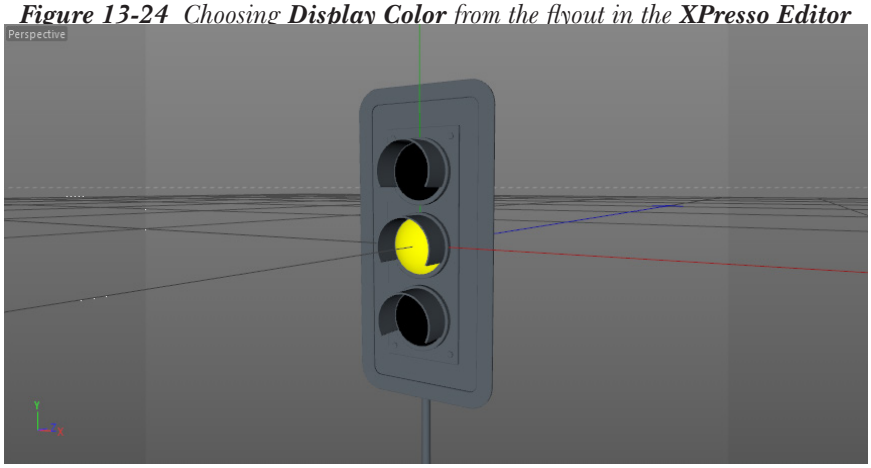

Figure 13-25 *The yellow light activated in the Perspective viewport*

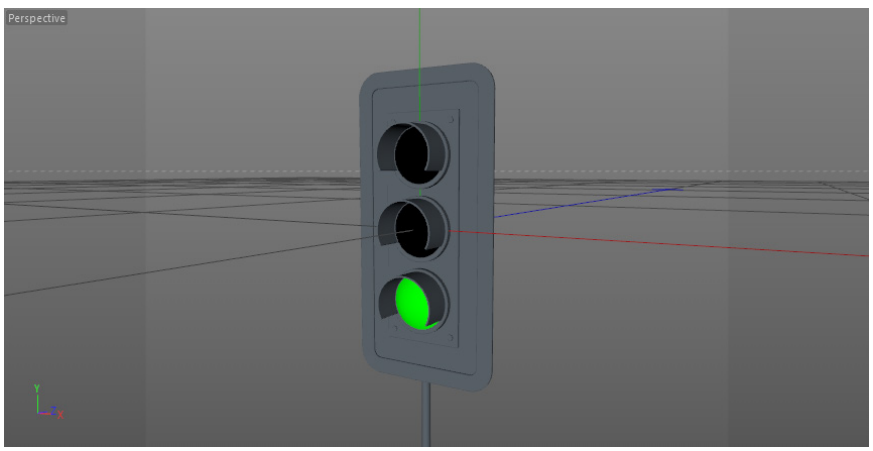

Figure 13-26 *The green light activated in the Perspective viewport*

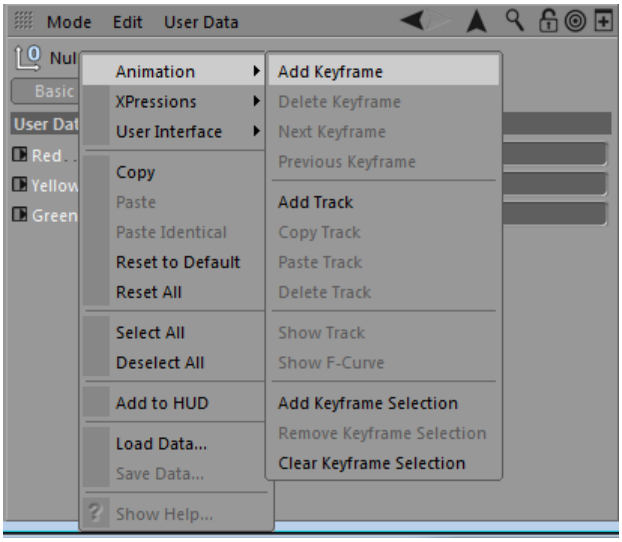

Figure 13-27 *The shortcut menu displayed on right-clicking in the* ***User Data*** *area*

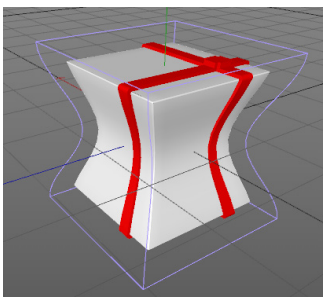

Figure 13-28 *The deformed object*

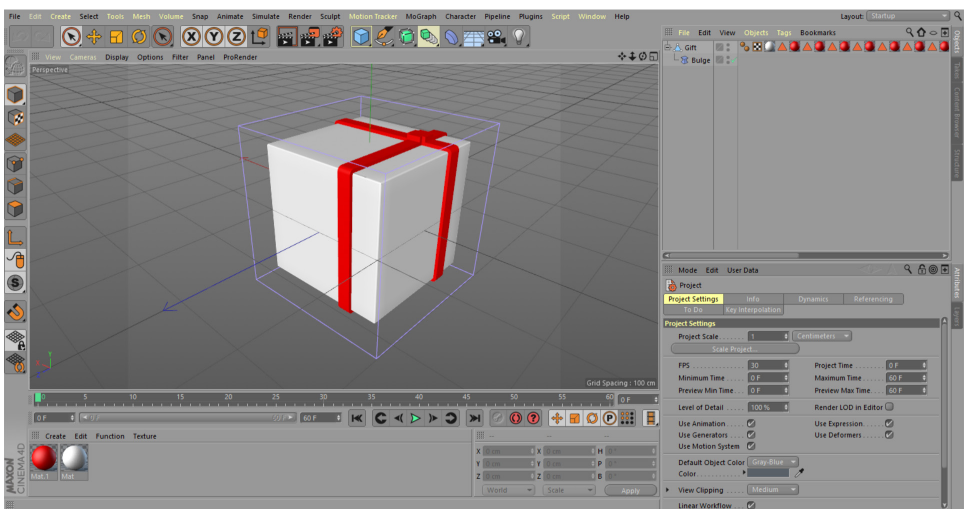

Figure 13-29 *The c13_tut2_start.c4d file*

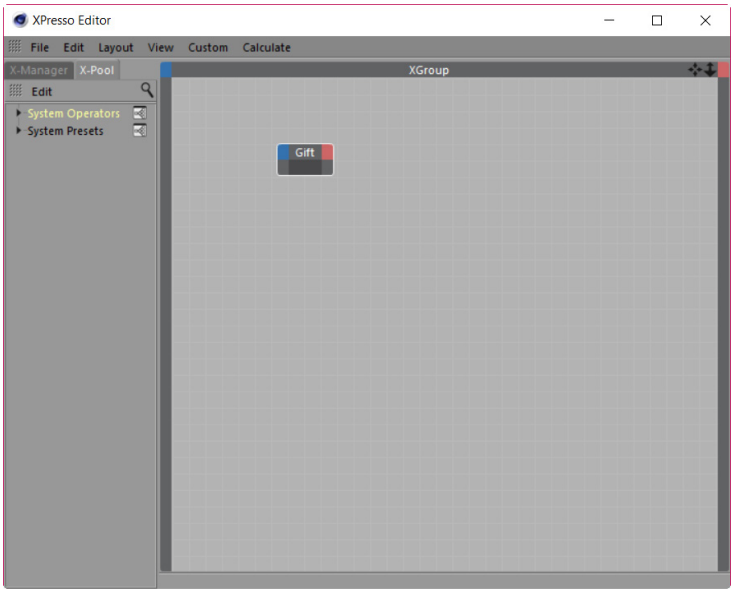

Figure 13-30 *The* ***Gift*** *node added in the* ***XPresso Editor***

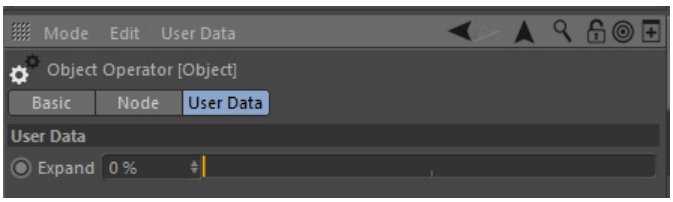

Figure 13-31 *The* ***Expand*** *spinner in the Attribute Manager*

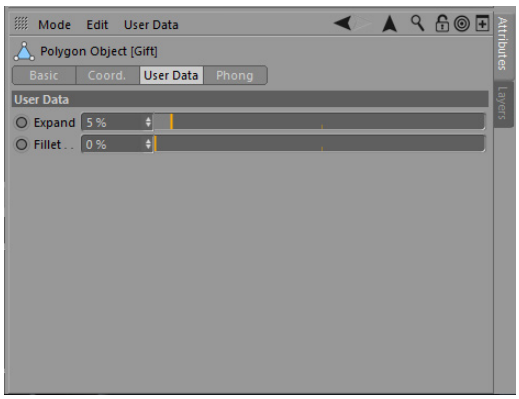

Figure 13-32 *The* ***Fillet*** *spinner added to the Attribute Manager*

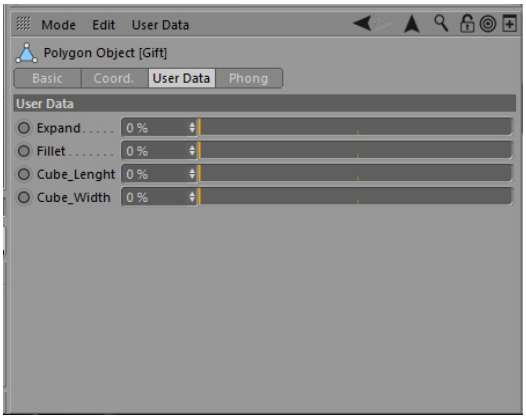

Figure 13-33 *The* ***Cube_Length*** *and* ***Cube_Width*** *spinners added to the Attribute Manager*

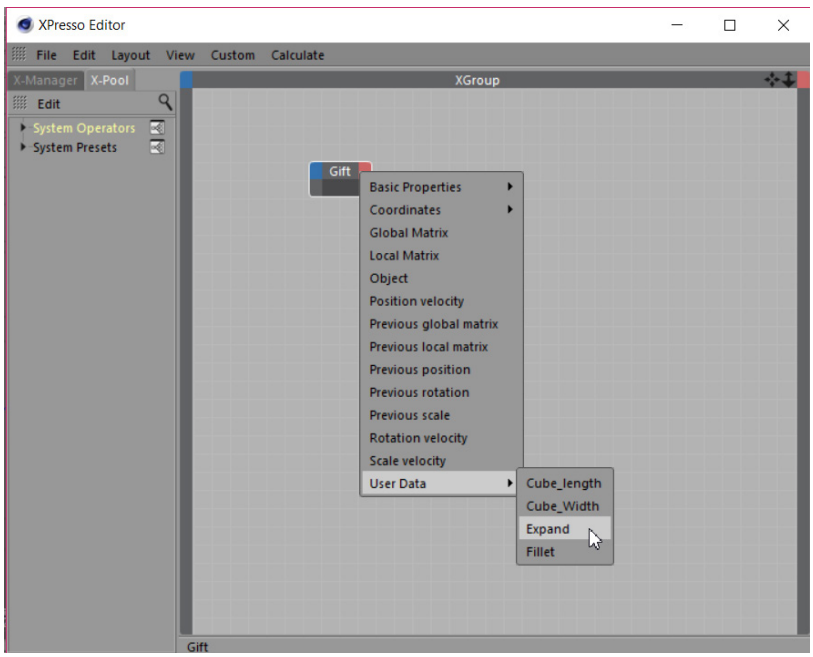

Figure 13-34 *Choosing* ***Expand*** *from the flyout in the* ***XGroup*** *area*

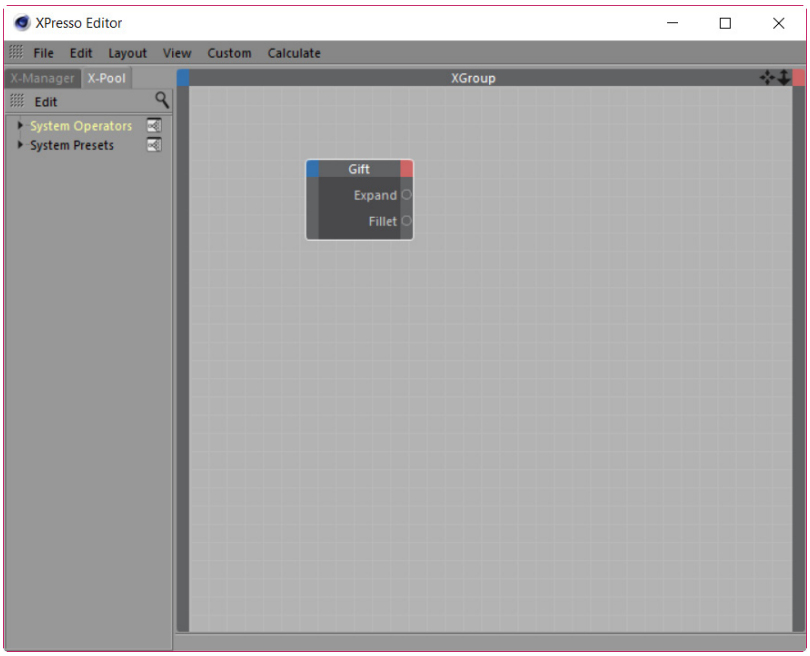

Figure 13-35 *The* ***Fillet*** *output port added to the* ***Gift*** *node*

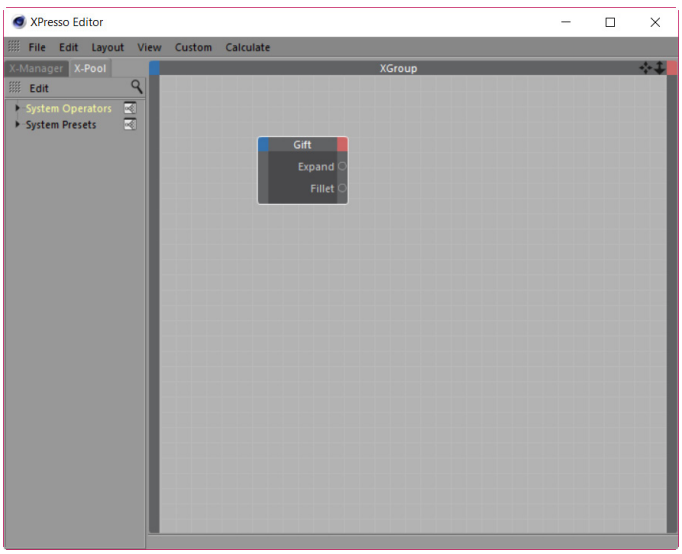

Figure 13-36 *The* ***Bulge*** *node in the* ***XGroup*** *area*

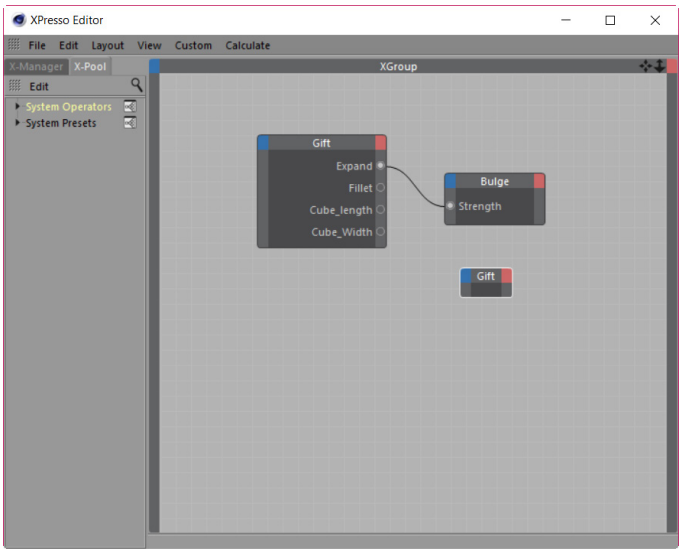

Figure 13-37 *Connection established between the* ***Gift*** *and* ***Bulge*** *nodes*

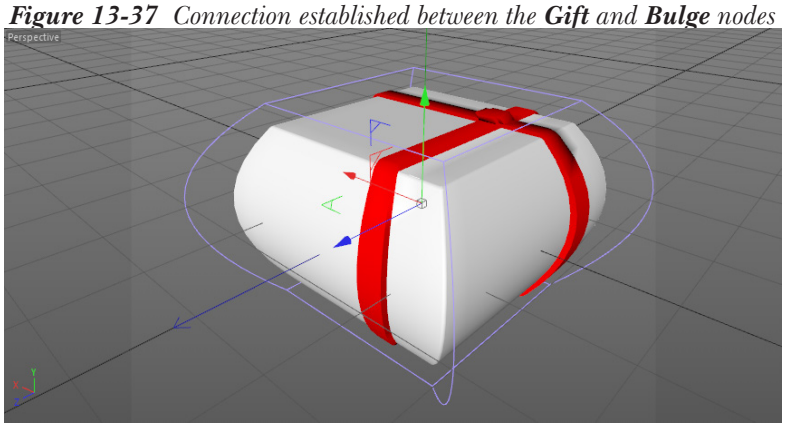

Figure 13-38 *Gift expanded in the Perspective viewport*

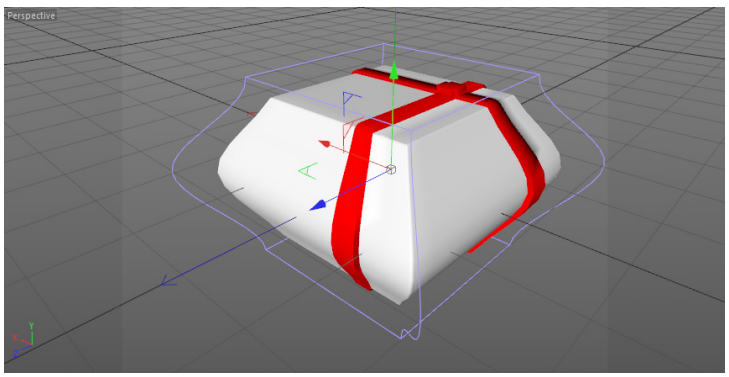

Figure 13-39 *The deformation of the Gift softened in the Perspective viewport*

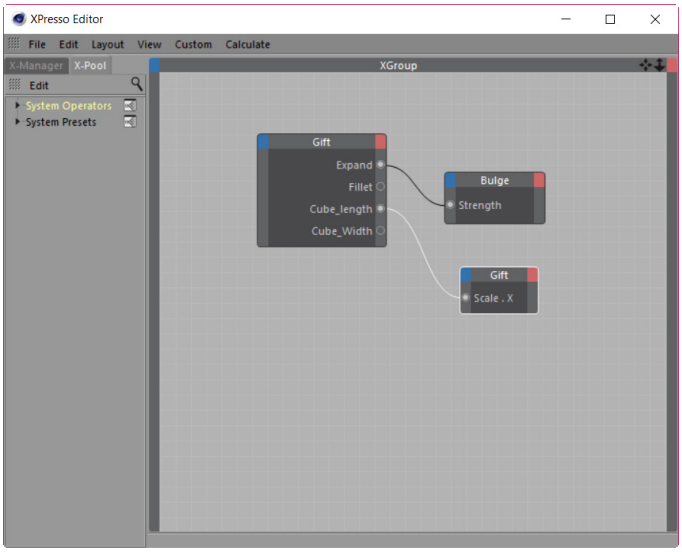

Figure 13-40 *The two* ***Gift*** *nodes connected with each other*

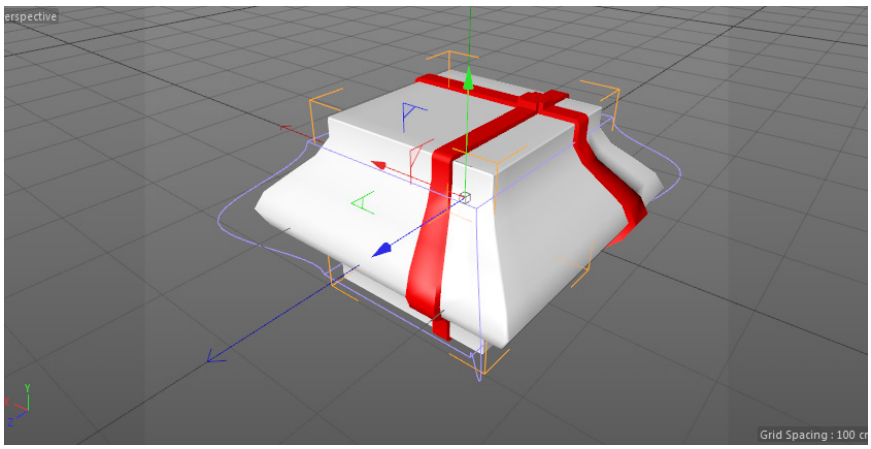

Figure 13-41 *The Gift scaled in the Perspective viewport*



Figure 13-42 *The logo at frame 49*

Project 1

Creating an Indoor Scene

PROJECT DESCRIPTION

In this project, you will create an indoor scene and merge 3D objects into it. The final output of this project is shown in Figure P1-1.

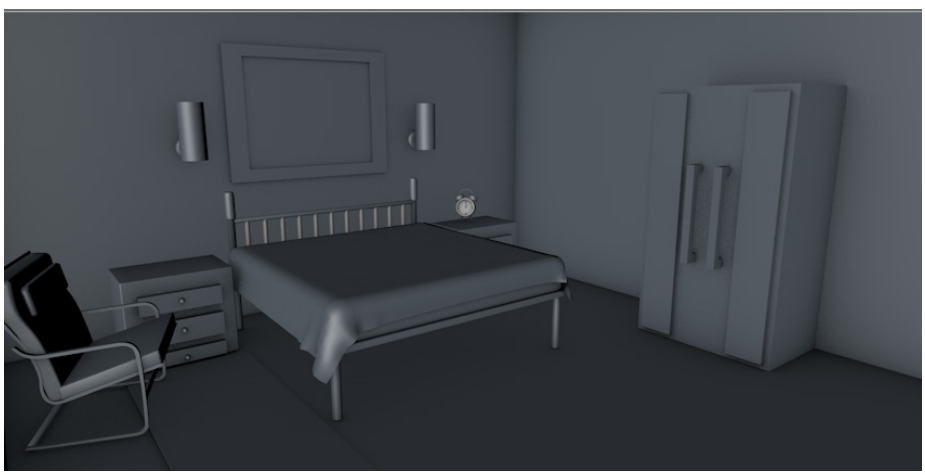

Figure P1-1 *The final output*

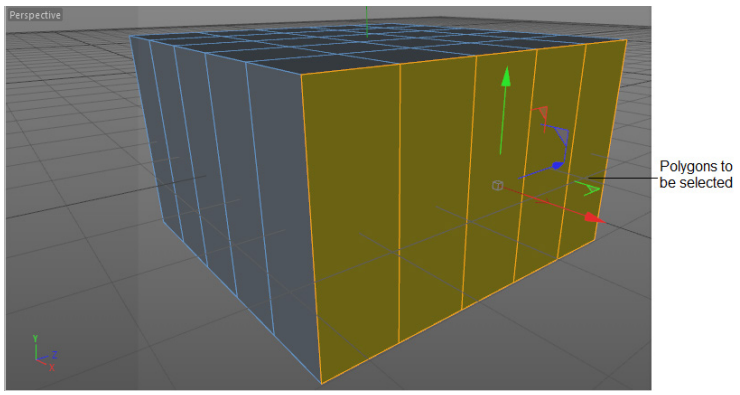

Figure P1-2 *The selected polygons displayed*

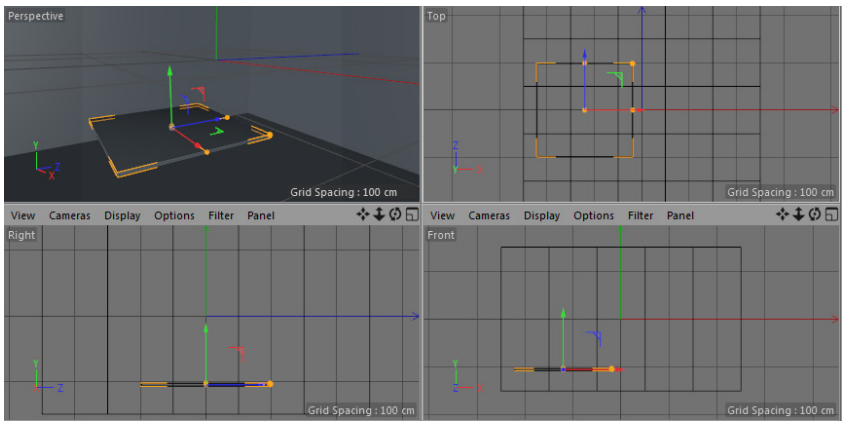

Figure P1-3 *The Base displayed in all viewports*

0

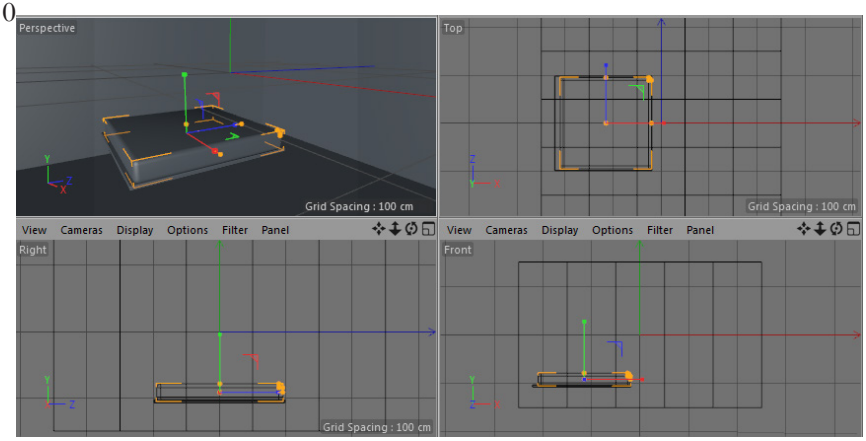

Figure P1-4 *Mattress aligned in all viewports*

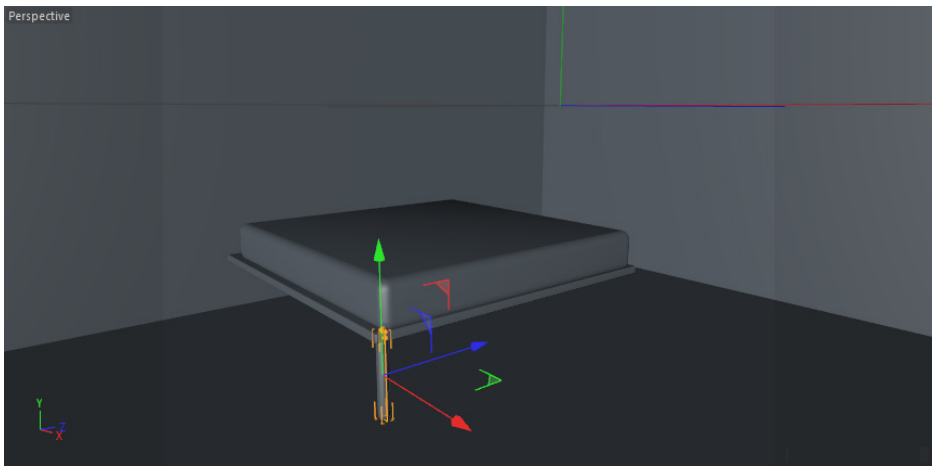

Figure P1-5 *The Leg1 displayed in the Perspective viewport*

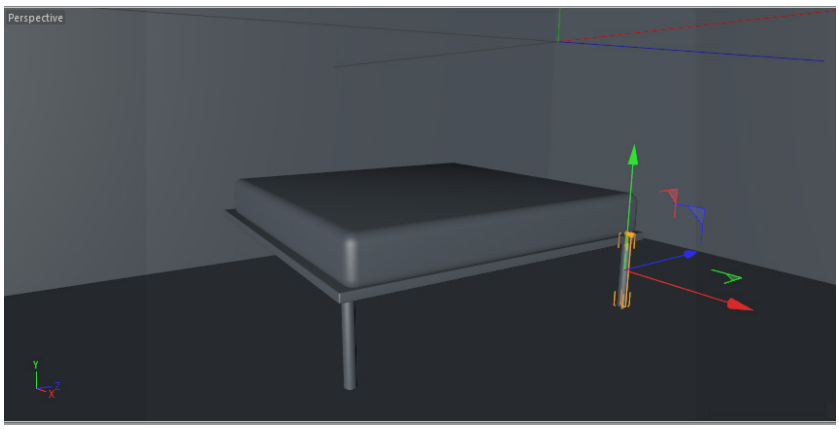

Figure P1-6 *Two legs displayed in the Perspective viewport*

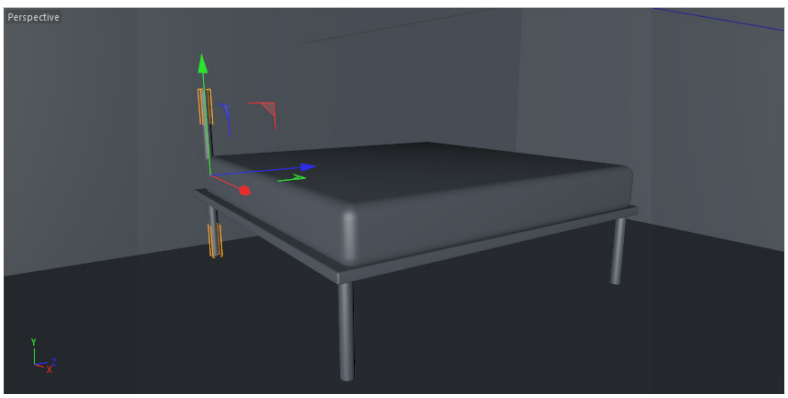

Figure P1-7 *The Leg1.2 displayed in the Perspective viewport*

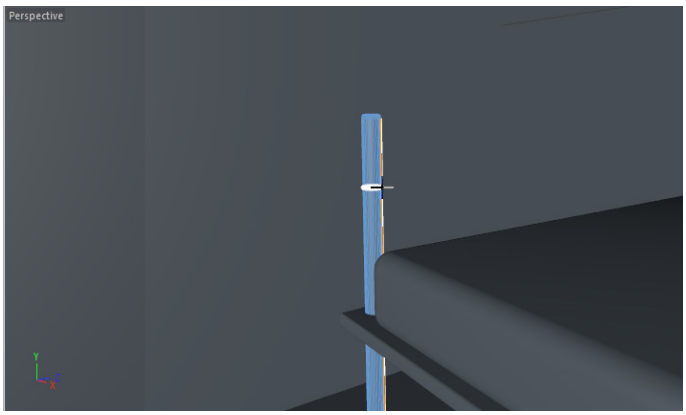

Figure P1-8 *Clicking on an edge*

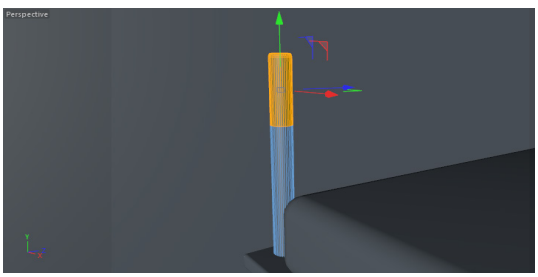

Figure P1-9 *The selected polygons*

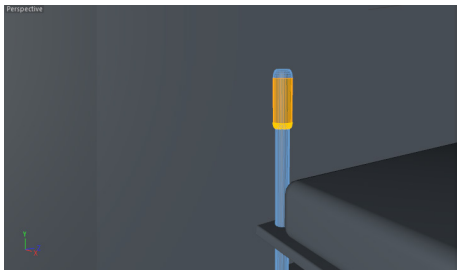

Figure P1-10 *The selected polygons bevelled*

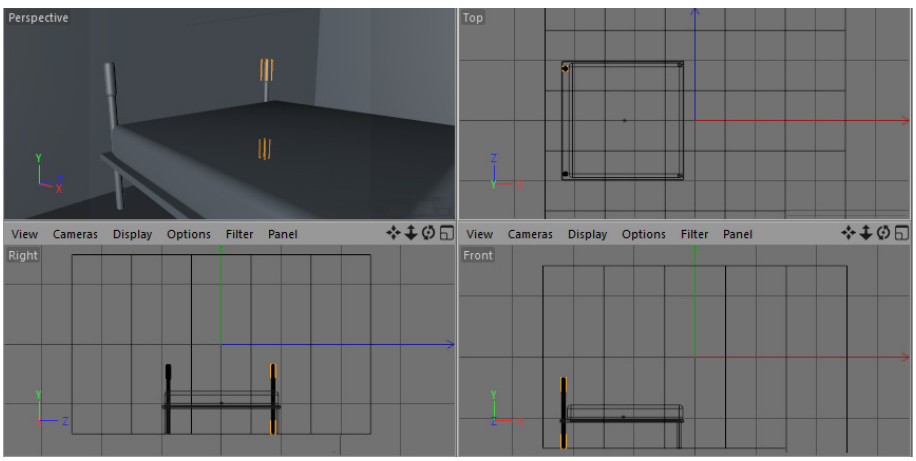

Figure P1-11 *The Leg1.3 aligned in all viewports*

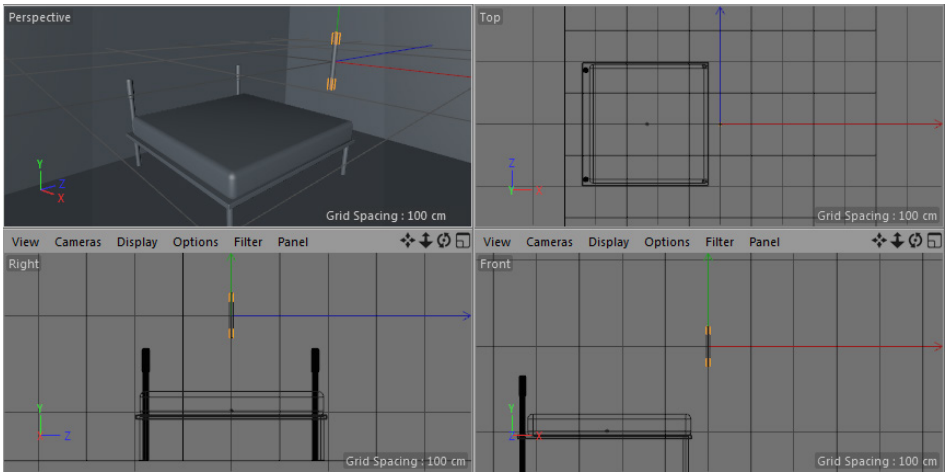

Figure P1-12 *The Support1 aligned in all viewports*

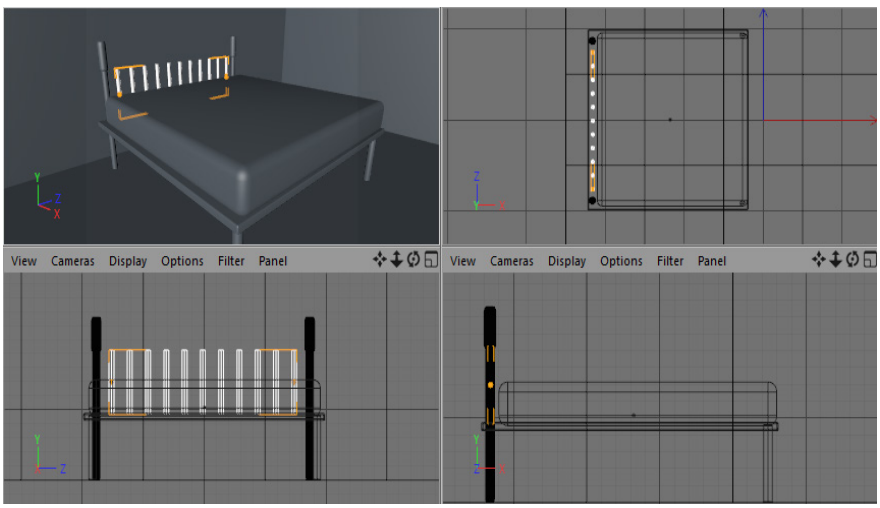

Figure P1-13 *The Support aligned in all viewports*

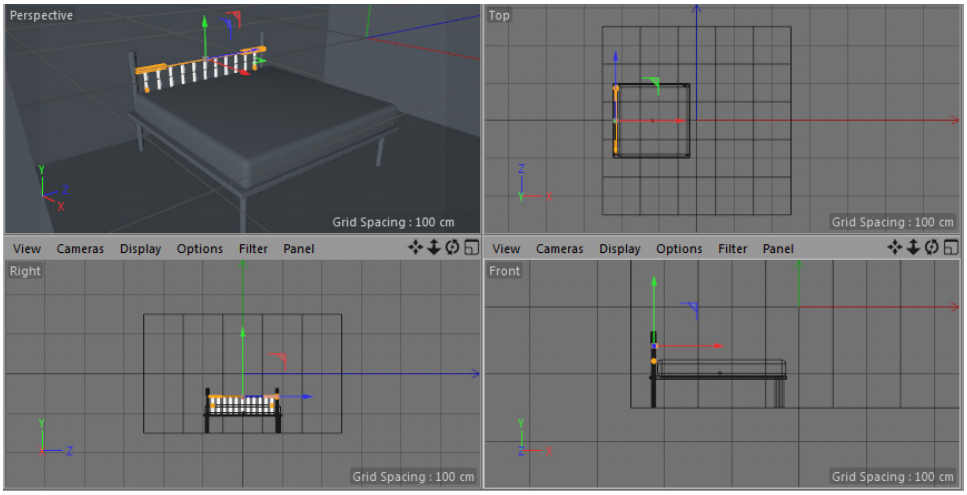

Figure P1-14 *The Rod aligned in all viewports*

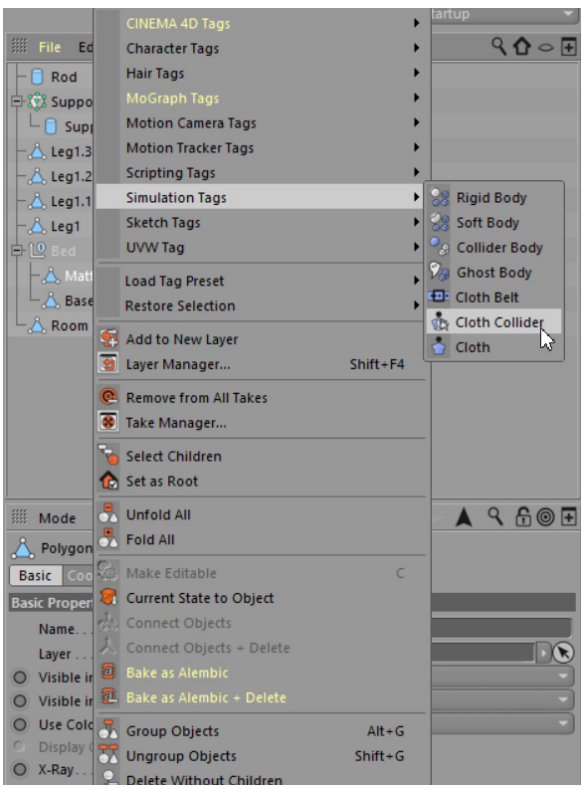

Figure P1-15 *Choosing* ***Cloth Collider*** *from the shortcut menu*

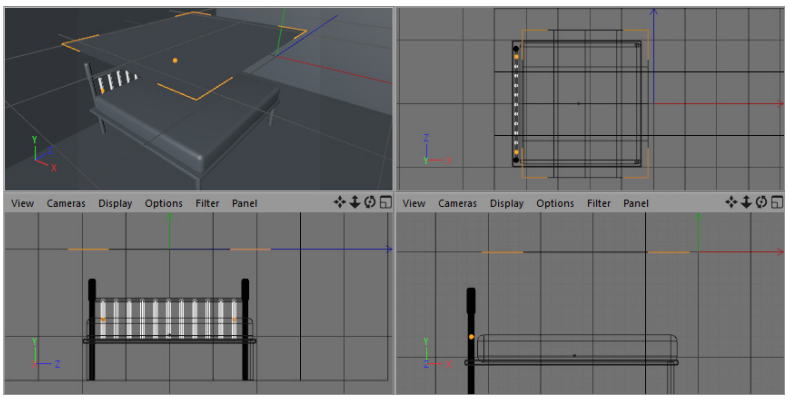

Figure P1-16 *Bedsheet aligned in all viewports*

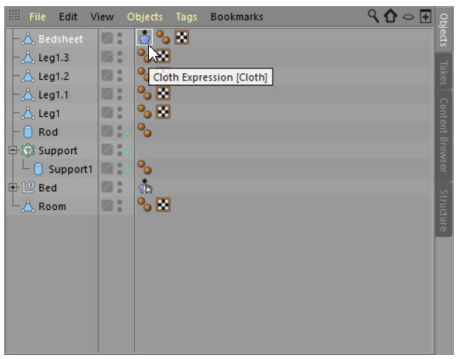

Figure P1-17 *The* ***Cloth Expression [Cloth]*** *tag added to the Object Manager*

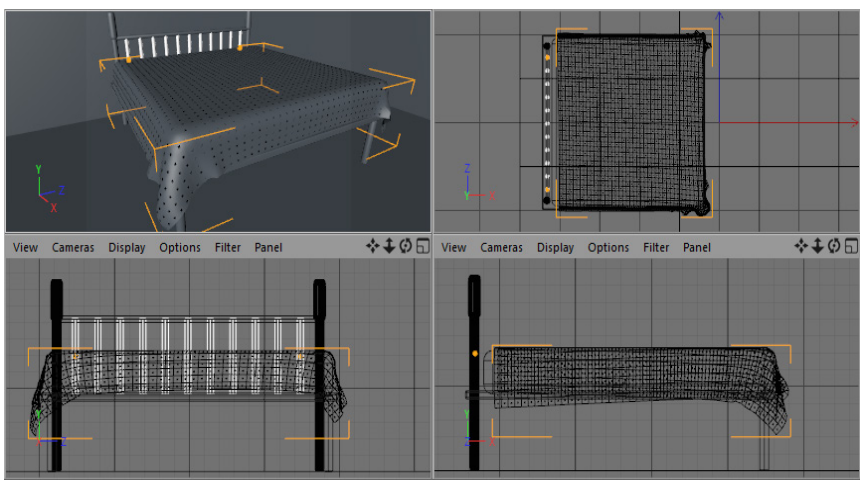

Figure P1-18 *The bedsheet aligned on Mattress*

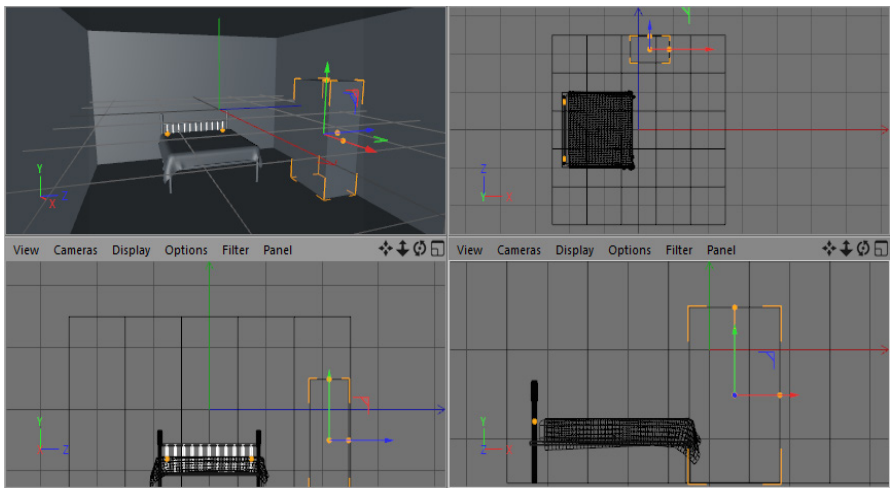

Figure P1-19 *The Wardrobe aligned in all viewports*

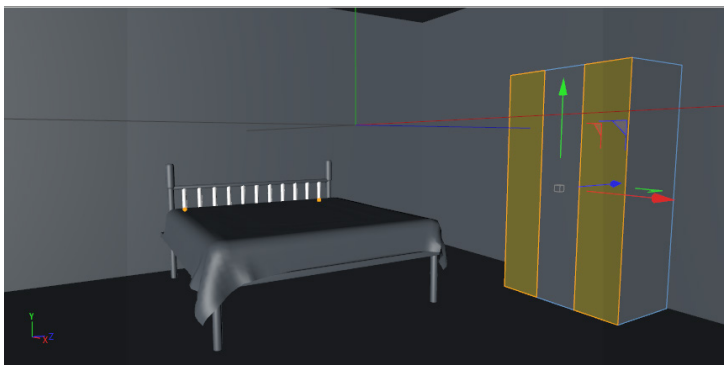

Figure P1-20 *The selected polygons displayed*

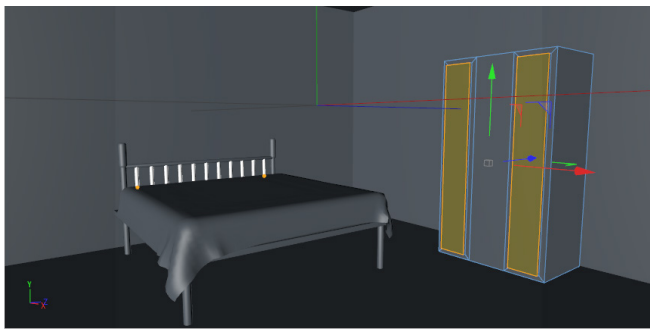

Figure P1-21 *The selected polygons extruded*

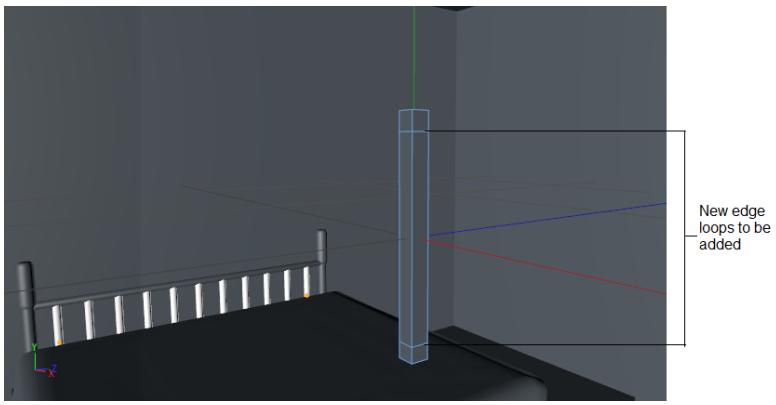

Figure P1-22 *The newly added edges displayed*

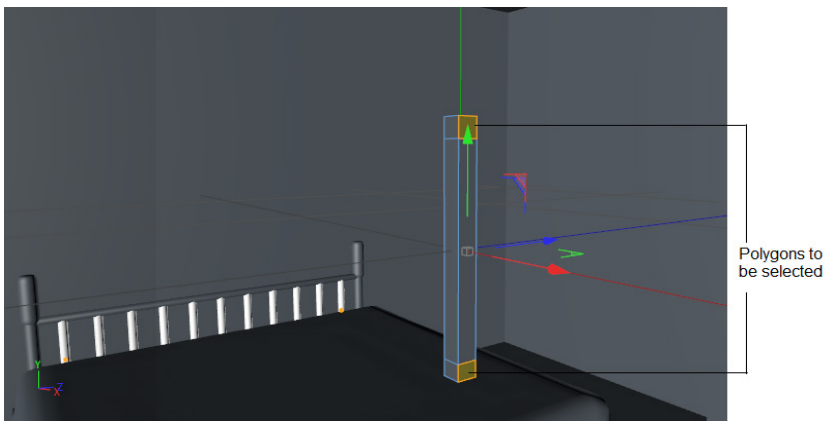

Figure P1-23 *The selected polygons*

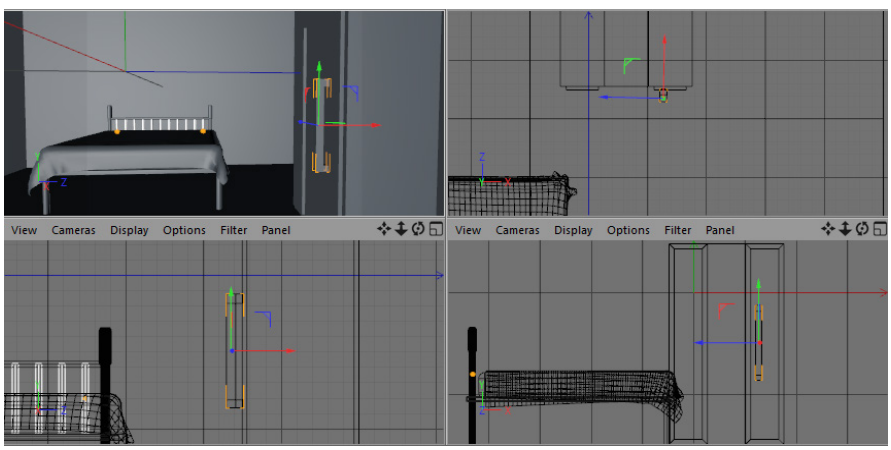

Figure P1-24 *The Handle aligned in all viewports*

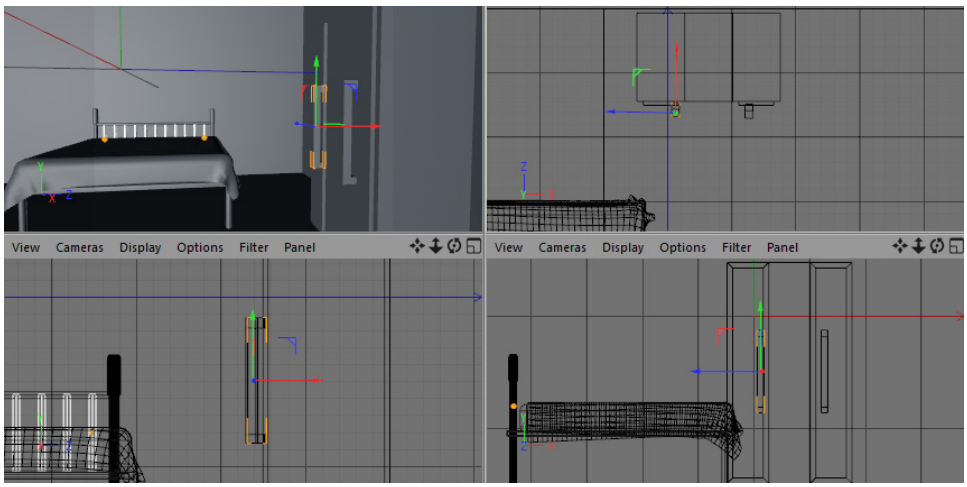

Figure P1-25 *The Handle.1 aligned in all viewports*

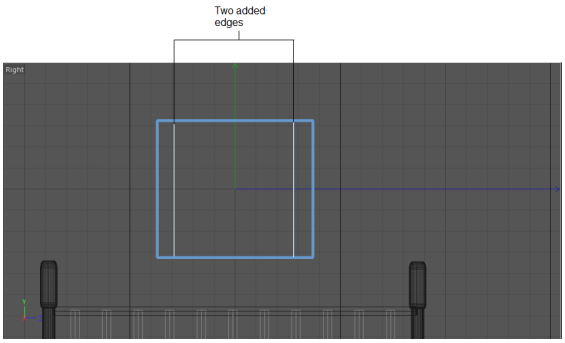

Figure P1-26 *Two vertical edge loops added*

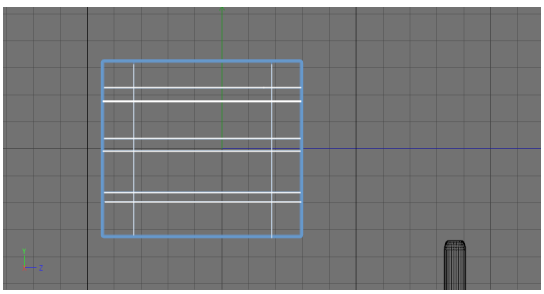

Figure P1-27 *Six horizontal edge loops added*

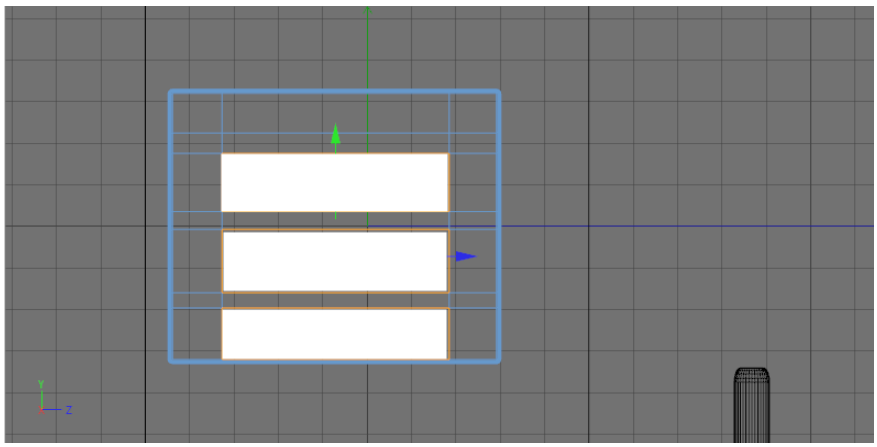

Figure P1-28 *The selected polygons*

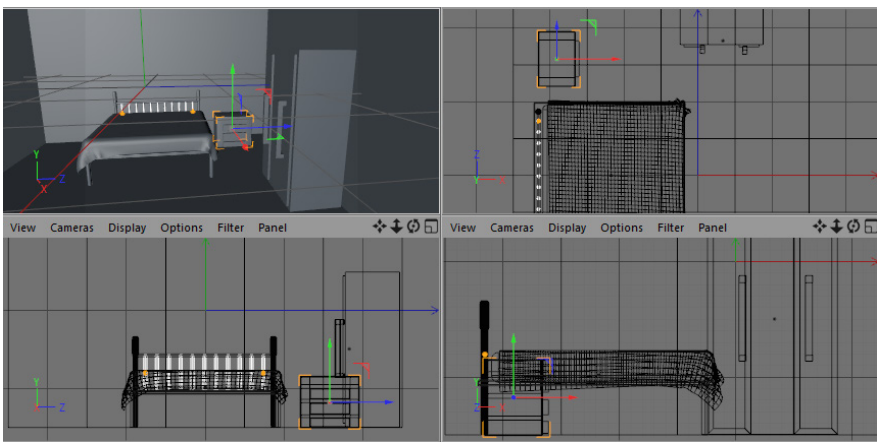

Figure P1-29 *Drawer 1 aligned in all viewports*

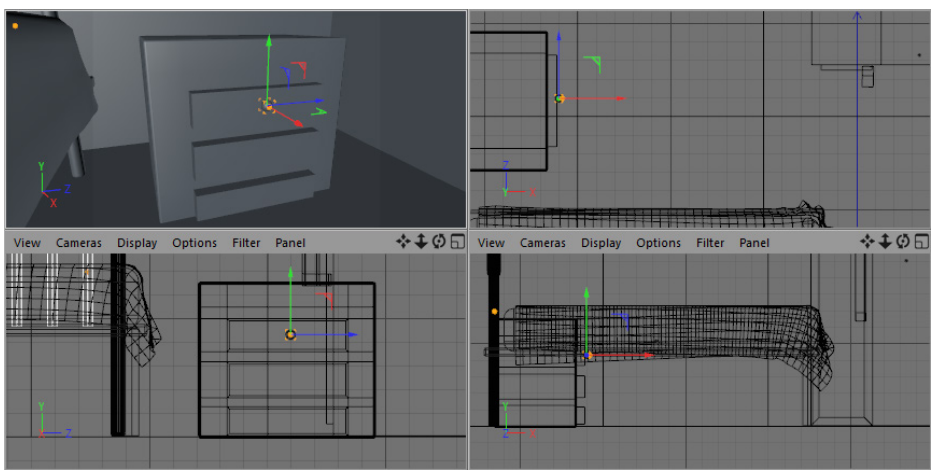

Figure P1-30 *Knob 1 positioned in all viewports*

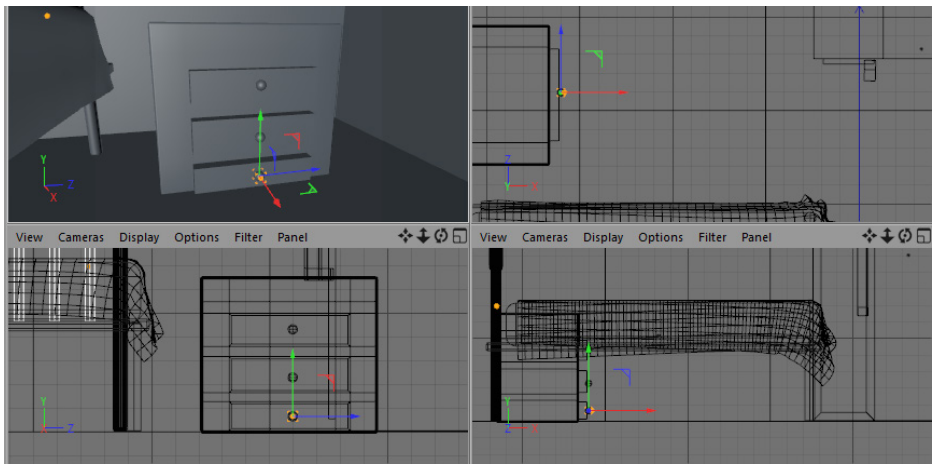

Figure P1-31 *The Knob 1, Knob 1.1, and Knob 1.2 displayed*

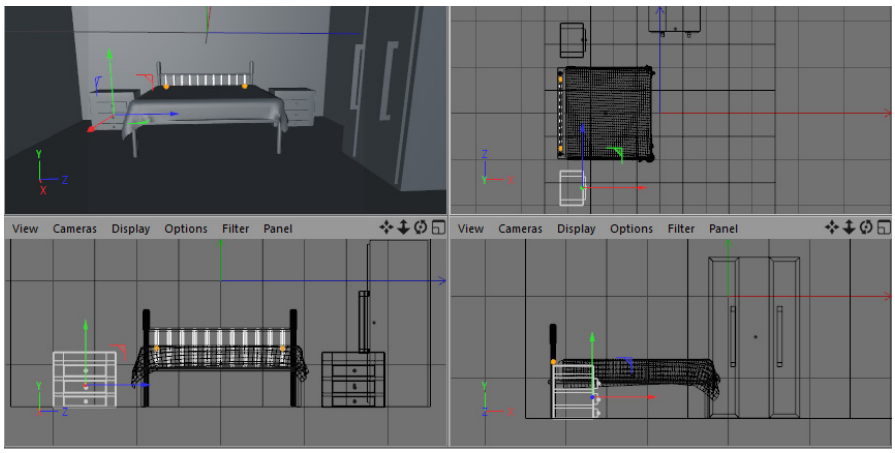

Figure P1-32 *The Drawers.1 aligned in all viewports*

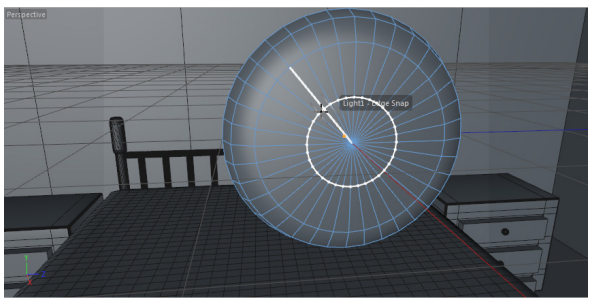

Figure P1-33 *The added edges displayed*

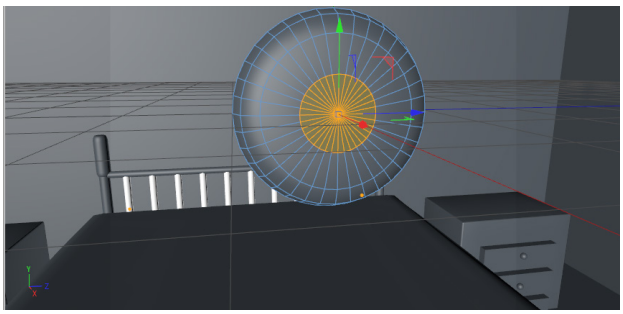

Figure P1-34 *The polygons selected*

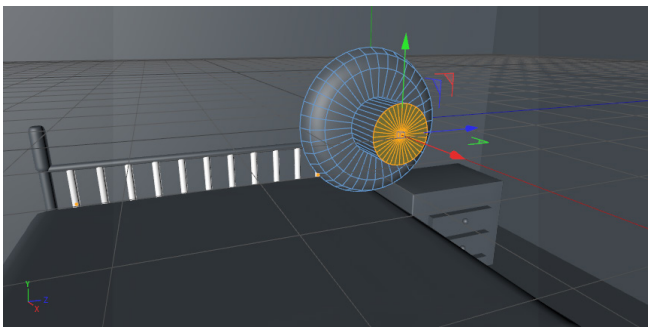

Figure P1-35 *The selected polygons extruded*

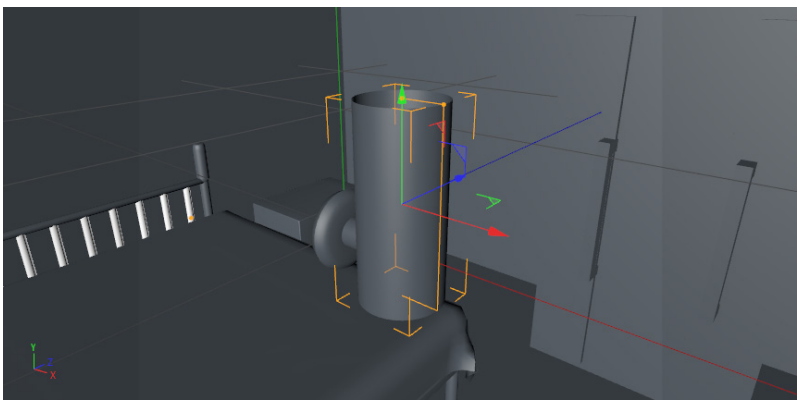

Figure P1-36 *Cover1 displayed in the Perspective viewport*

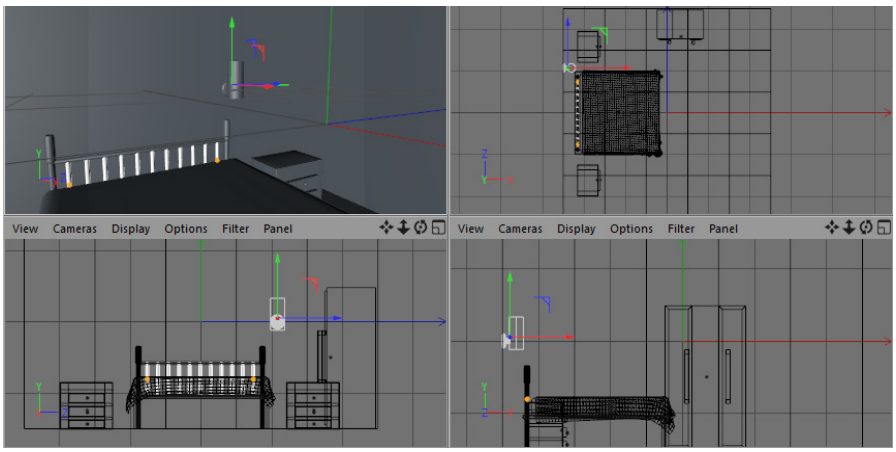

Figure P1-37 *The Lights displayed in all viewports*

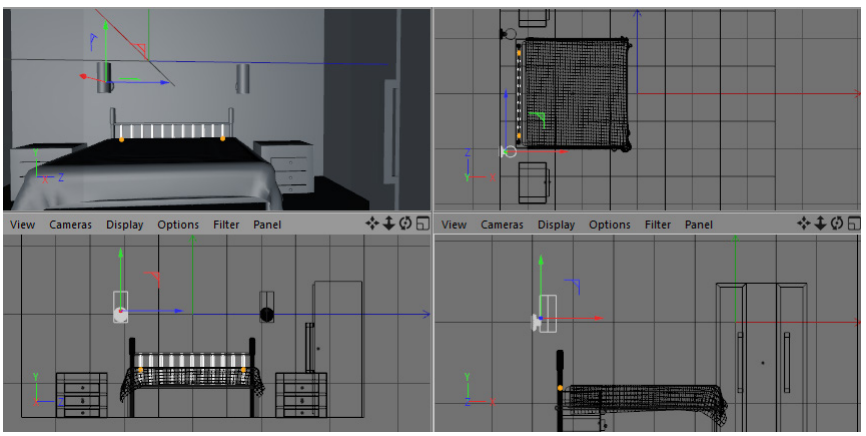

Figure P1-38 *The Lights.1 aligned in all viewports*

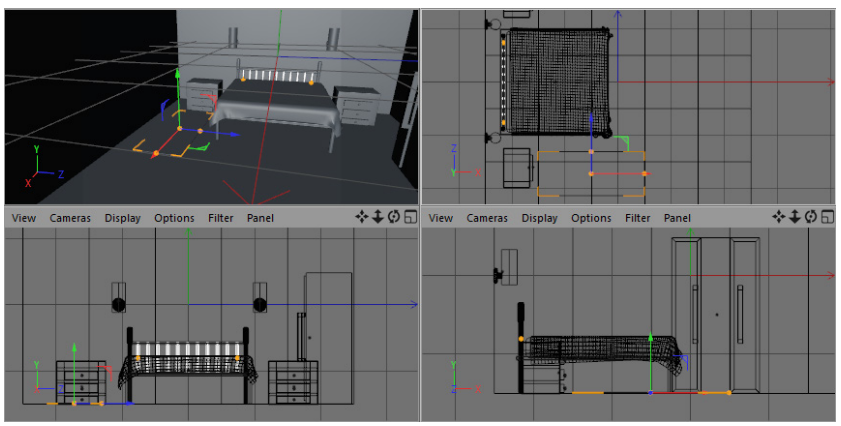

Figure P1-39 *The Mat aligned in all viewports*

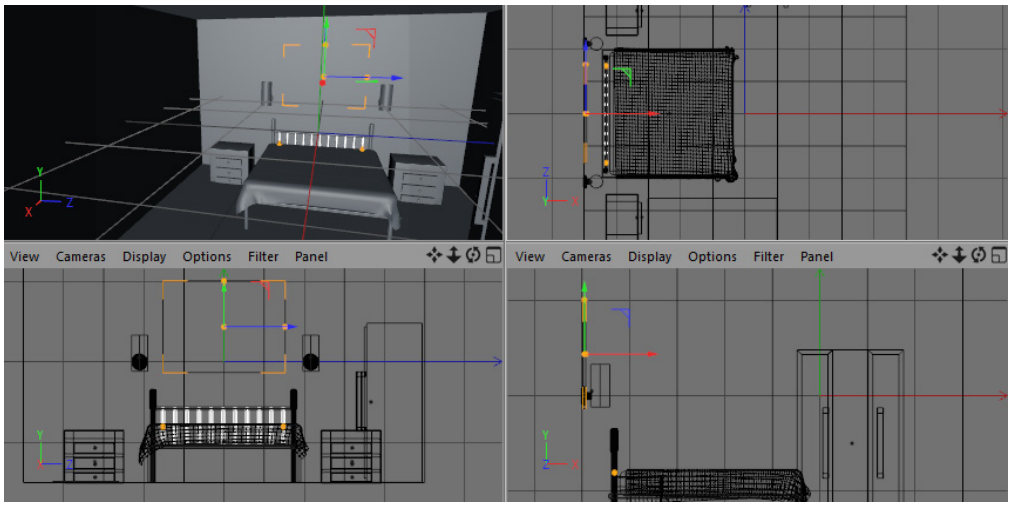

Figure P1-40 *The Wooden Frame aligned in all viewports*

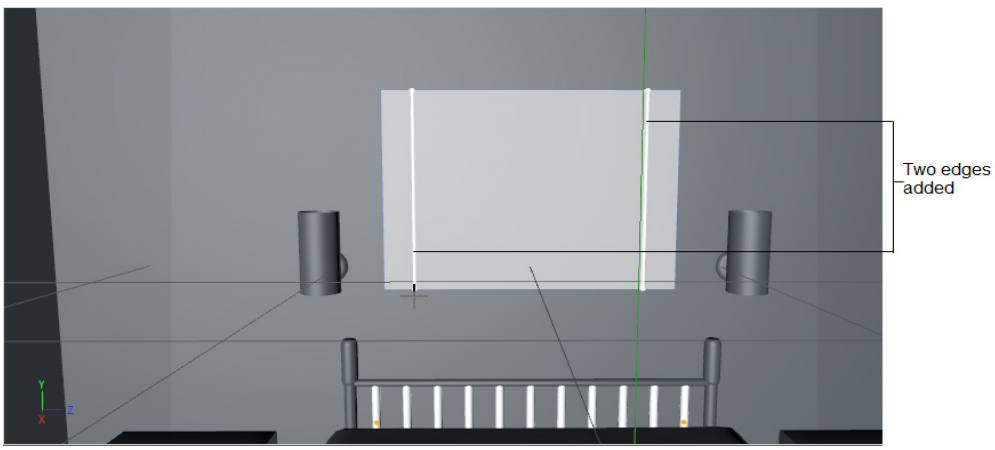

Figure P1-41 *The added vertical edges displayed*

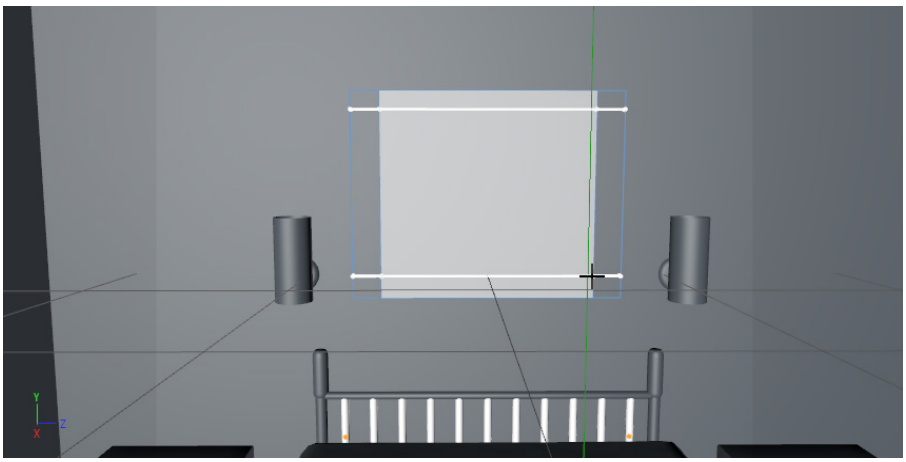

Figure P1-42 *The horizontal added edges displayed*

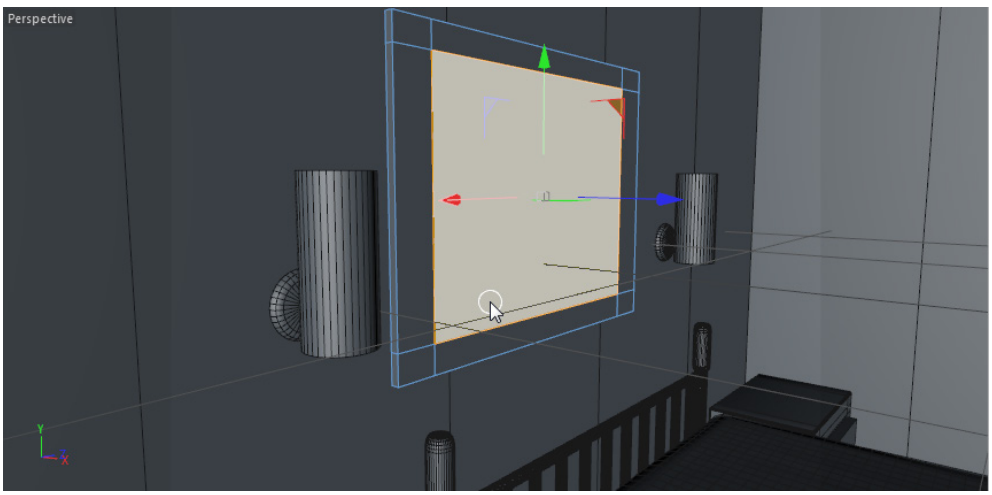

Figure P1-43 *The polygon selected*

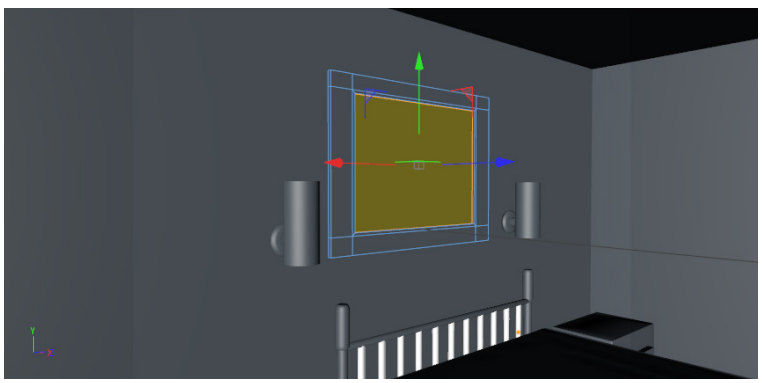

Figure P1-44 *The Wooden Frame extruded in the Perspective viewport*

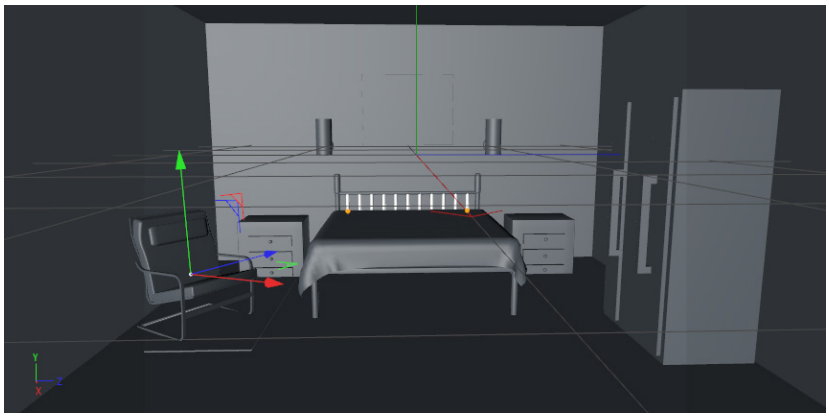

Figure P1-45 *Displaying the Chair positioned in the Perspective viewport*

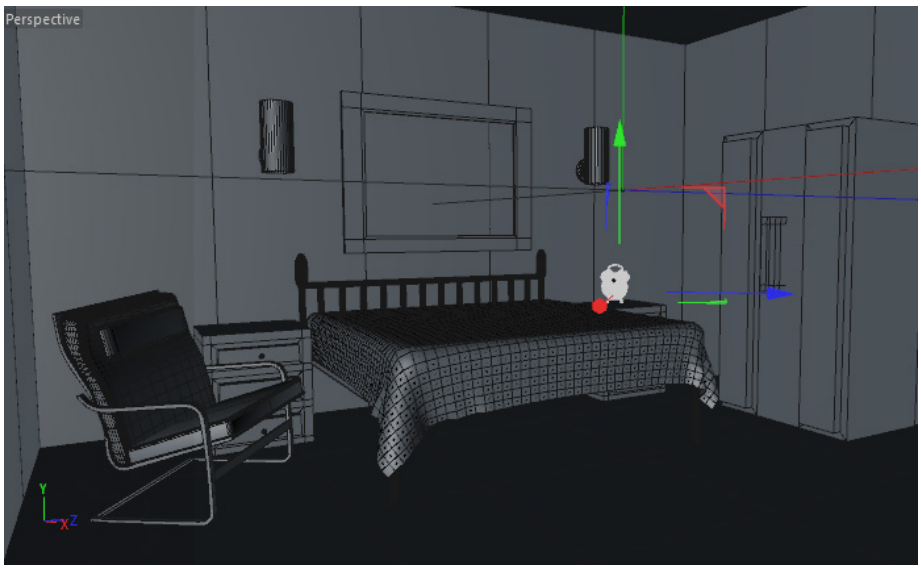

Figure P1-46 *The Clock positioned in the Perspective viewport*

Project 2

Texturing an Indoor Scene

PROJECT DESCRIPTION

In this project, you will apply texture and light to the scene that you have created in Project 1. You will also render the scene. The final output of this project is shown in Figure P2-1.



Figure P2-1 *The final output*

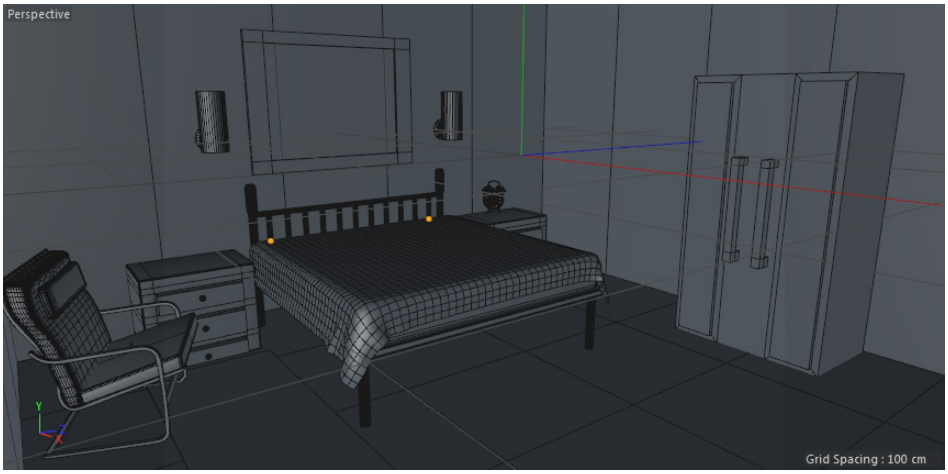

Figure P2-2 *The Project2_start.c4d file*

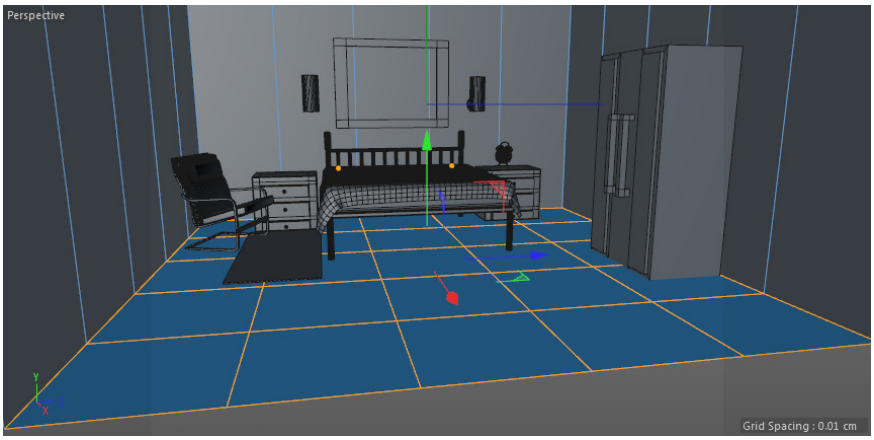

Figure P2-3 *The bottom polygons of Room selected*

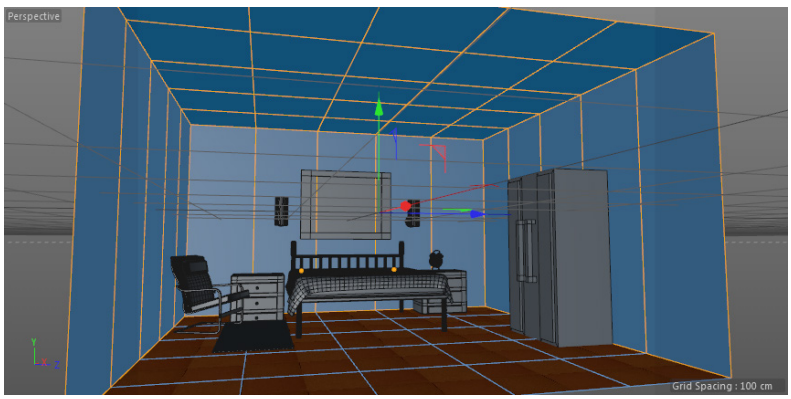

Figure P2-4 *The polygons of the walls and roof selected*

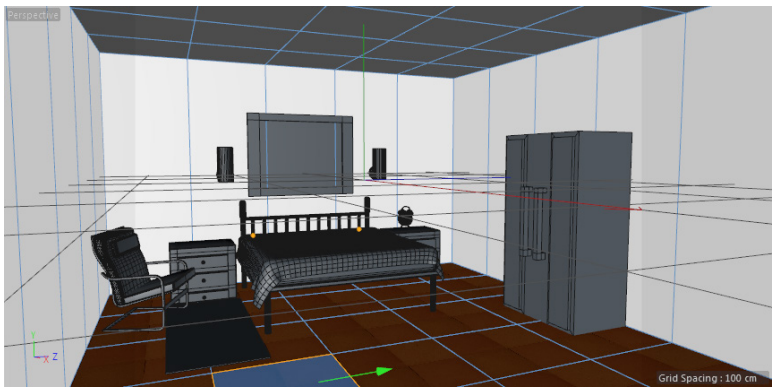

Figure P2-5 *The Wall material assigned to walls of the Room*

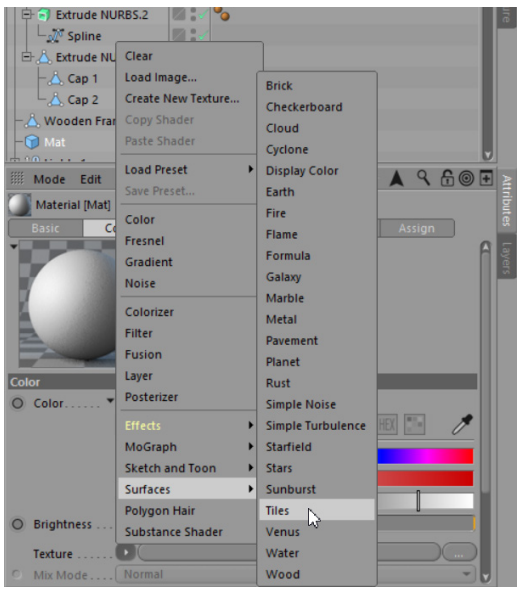

Figure P2-6 *Choosing* ***Surfaces > Tiles*** *from the flyout*

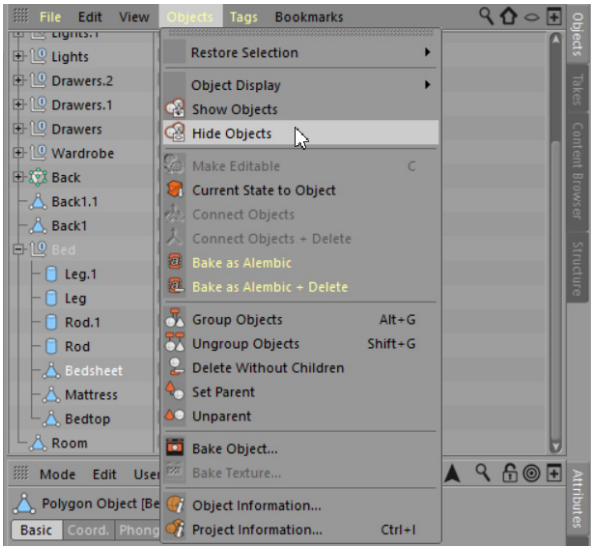

Figure P2-7 *Choosing* ***Hide Objects*** *from the main menu in the Object Manager*

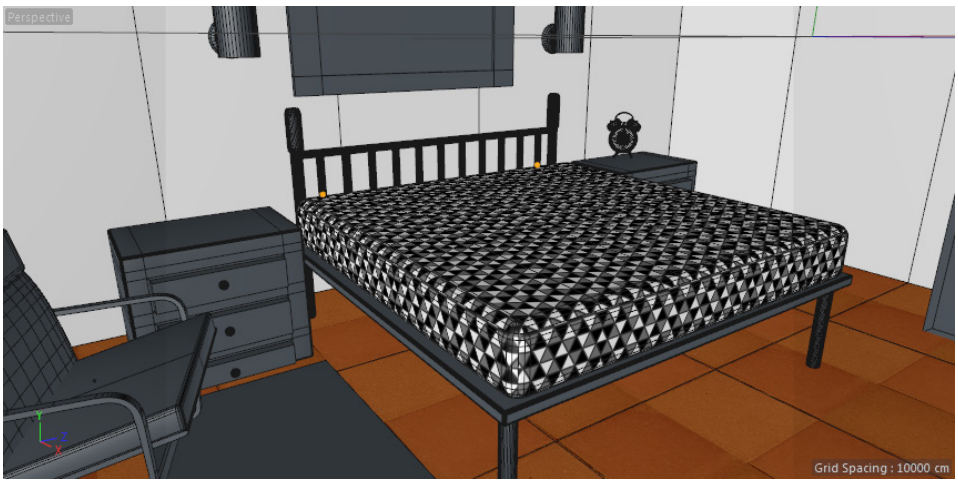

Figure P2-8 *The Mattress material displayed*

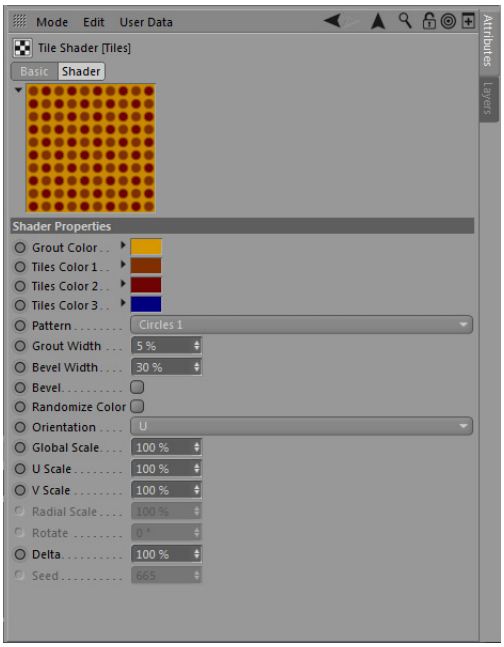

Figure P2-9 *The Bedsheet texture created in the* ***Shader Properties*** *area*

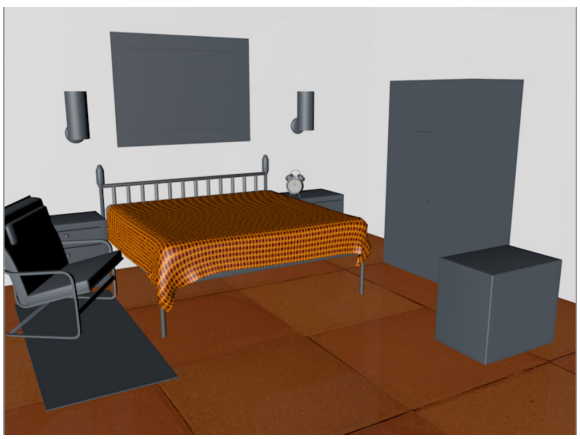

Figure P2-10 *The Bedsheet material displayed*

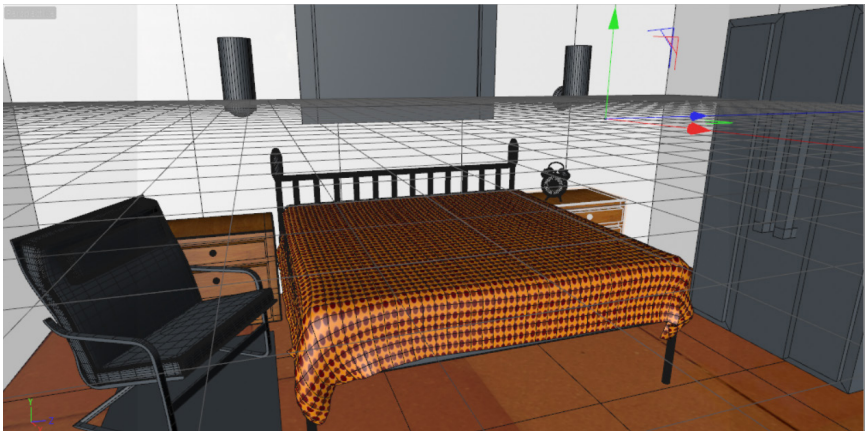

Figure P2-11 *The Drawer mat material applied to drawers*



Figure P2-12 *The selected polygons of Wardrobe*

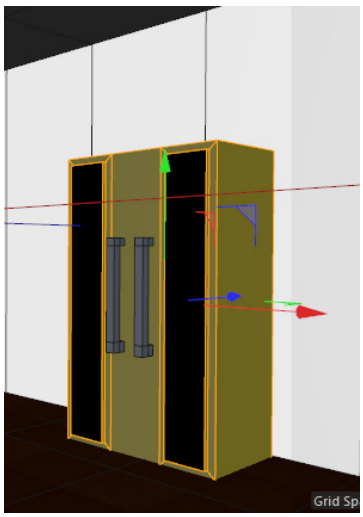

Figure P2-13 *Selecting the rest of the polygons*



Figure P2-14 *The Almirah and Mirror materials applied to Wardrobe in the rendered scene*



Figure P2-15 *The Chair mat material applied*

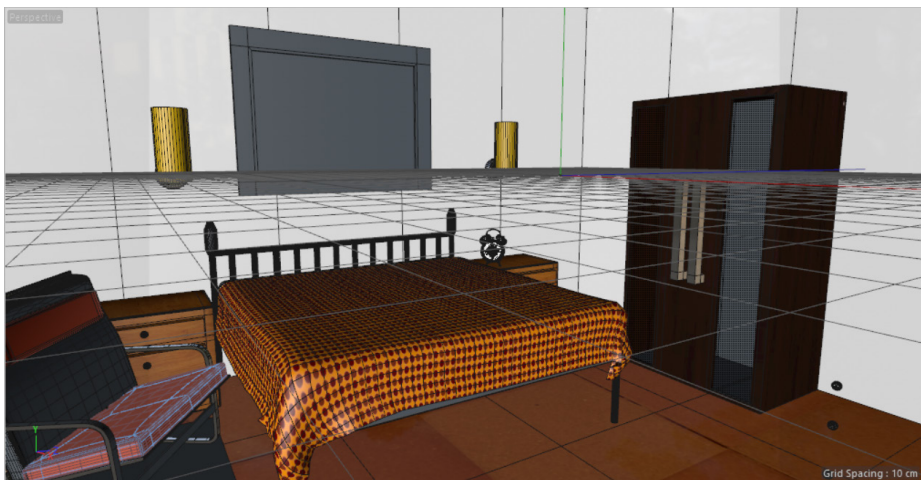

Figure P2-16 *The materials applied to Lights and Light.1 groups*

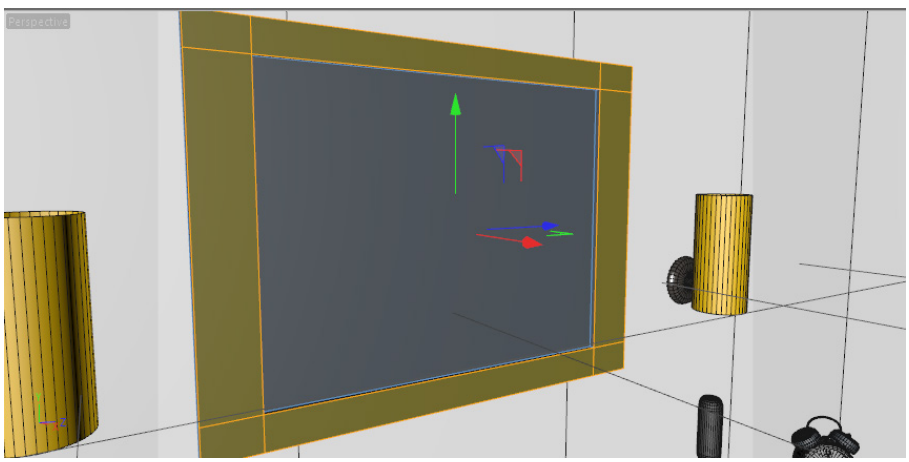

Figure P2-17 *The selected polygons of Wooden Frame*

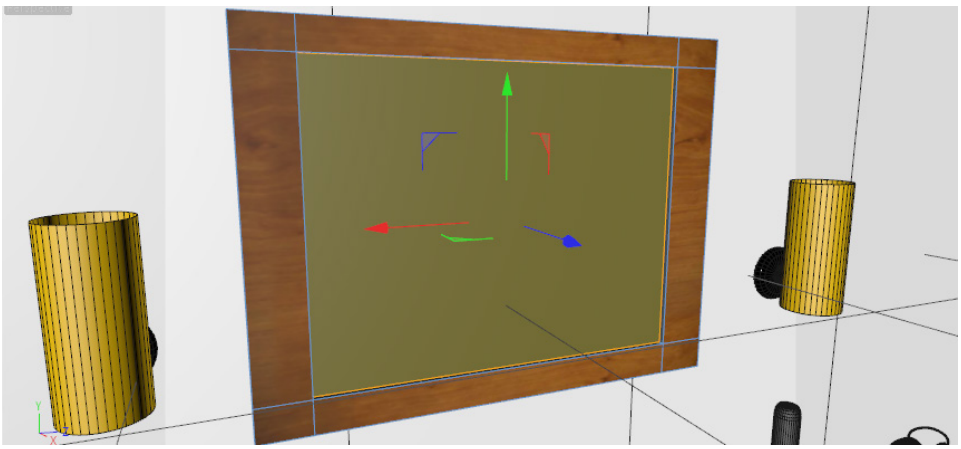

Figure P2-18 *The selected polygon of Wooden Frame*



Figure P2-19 *The Painting material mapped to Wooden Frame*



Figure P2-20 *The final rendered scene*