Chapter 1

Introduction to Blender Interface

Learning Objectives

After completing this chapter, you will be able to:

- *Understand the Blender interface components*
- *Use controls for creating or modifying objects*
- *Use hotkeys in Blender*
- *Customize the Blender layout*
- *Customize the colors of the scene components*

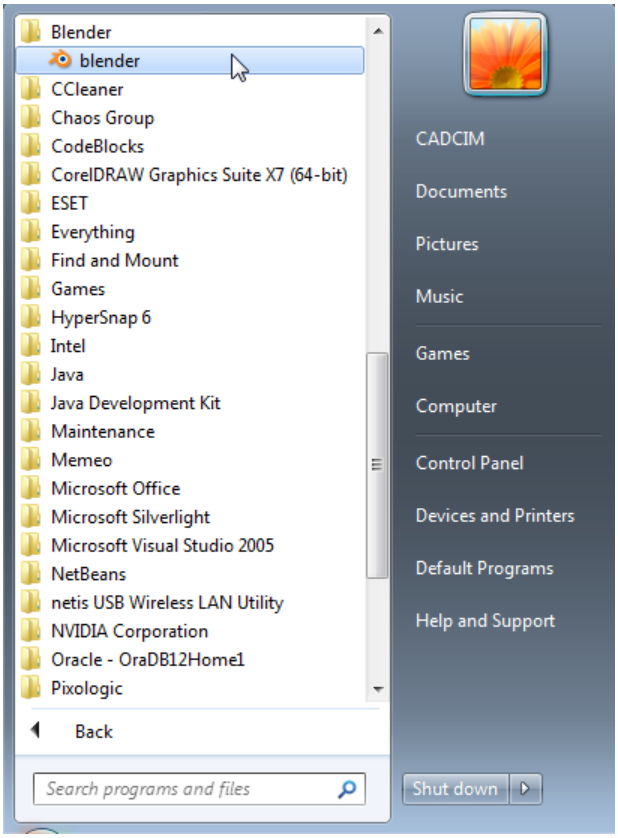

Figure 1-1 *Starting Blender 2.79 using the taskbar*

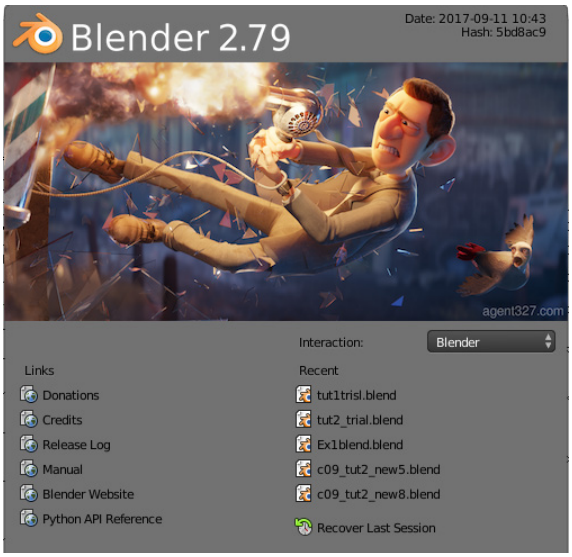

Figure 1-2 *The* ***Blender 2.79*** *splash screen*

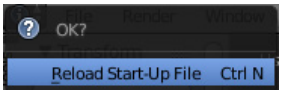

Figure 1-3 The menu displayed

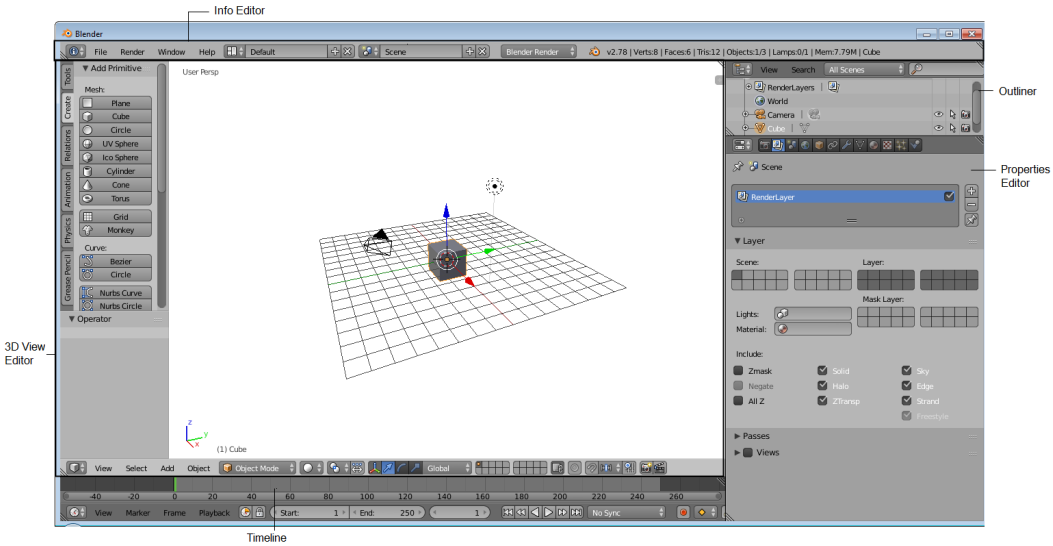

Figure 1-4 Five different components of Blender interface

*Figure 1-5 The **Info Editor***

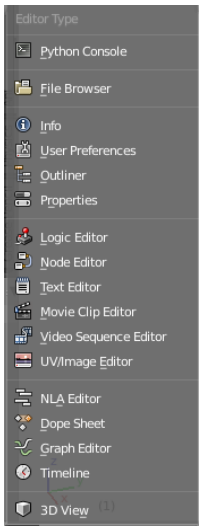

*Figure 1-6 The **Editor Type** drop-down*

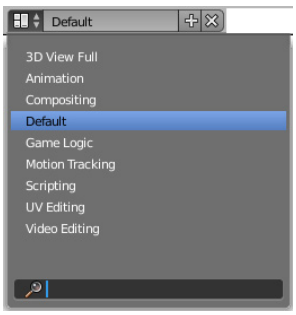

*Figure 1-7 The **Screen Layout** drop-down*

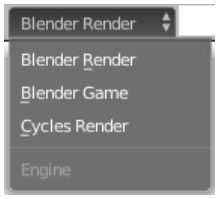

Figure 1-8 *The* ***Engine*** *drop-down*

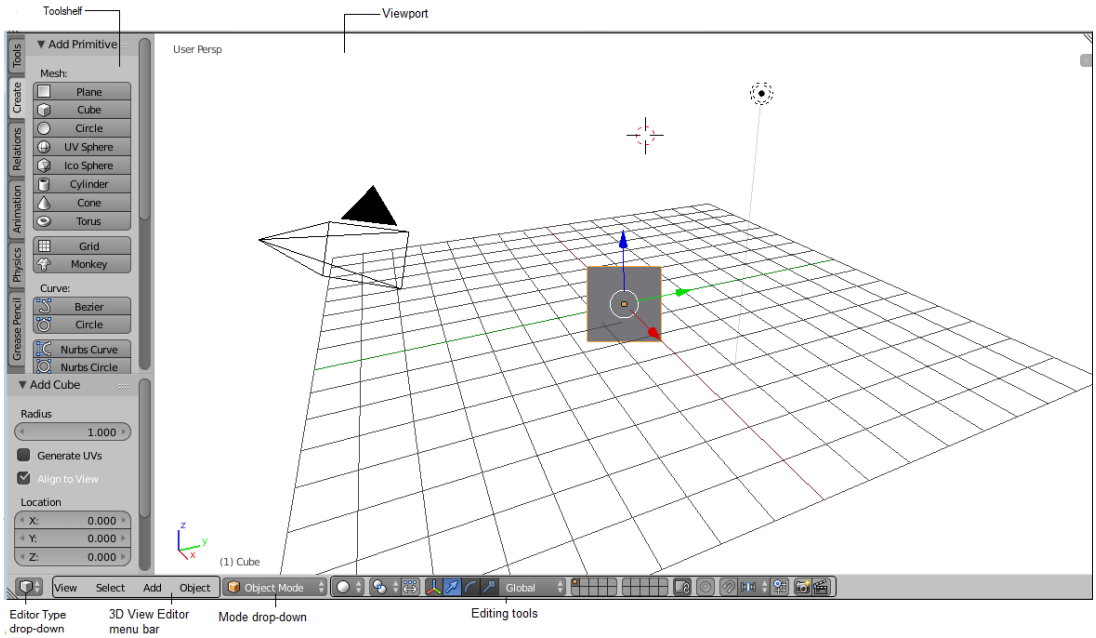

Figure 1-9 *The* ***3D View Editor***

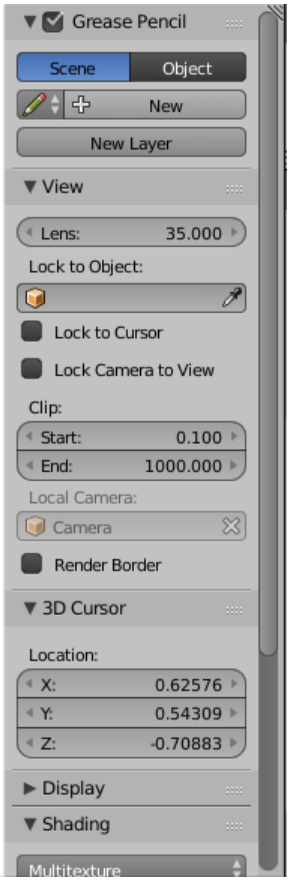

Figure 1-10 *The* ***Properties*** *Region*

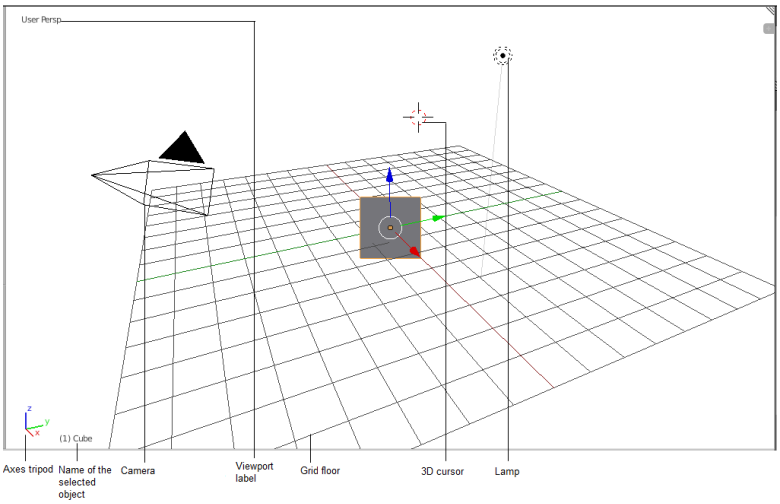

Figure 1-11 *The view components*

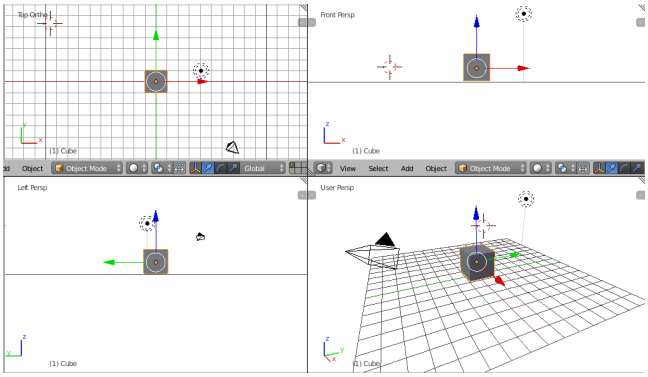

Figure 1-12 *The four views*

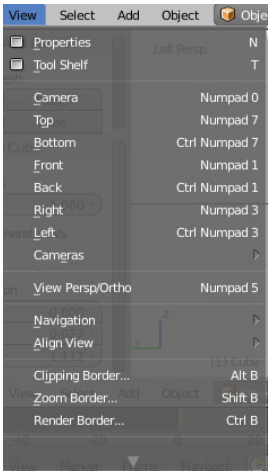

Figure 1-13 *The* ***View*** *menu*

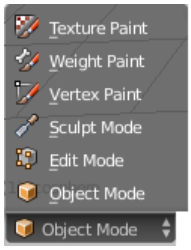

Figure 1-14 *The* ***Mode*** *drop-down*

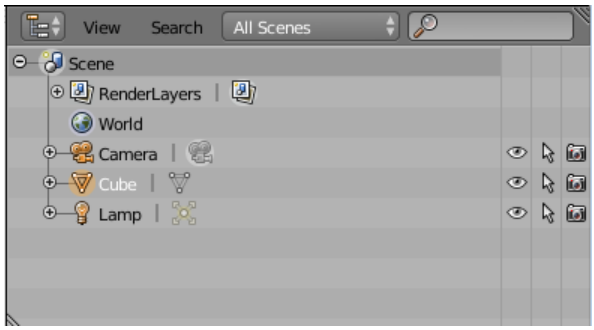

Figure 1-15 *The* ***Outliner***

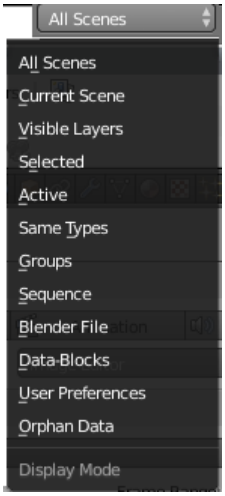

Figure 1-16 *The* ***Display*** *drop-down*

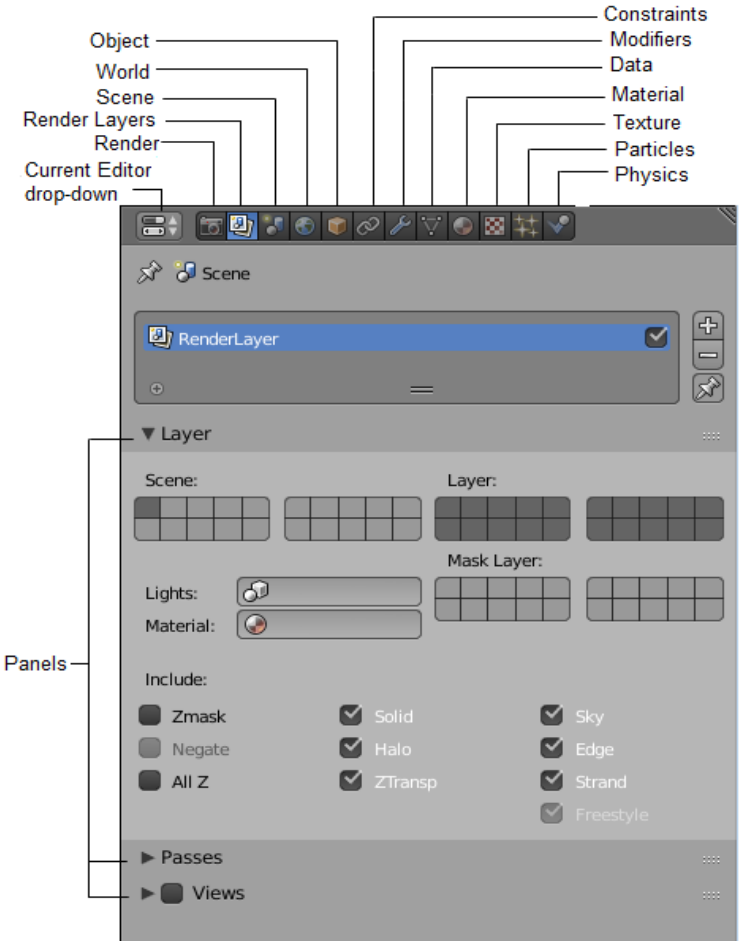

Figure 1-17 *The* ***Properties Editor***

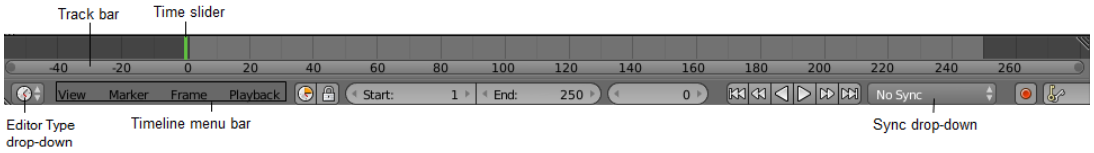

Figure 1-18 The ***Timeline***

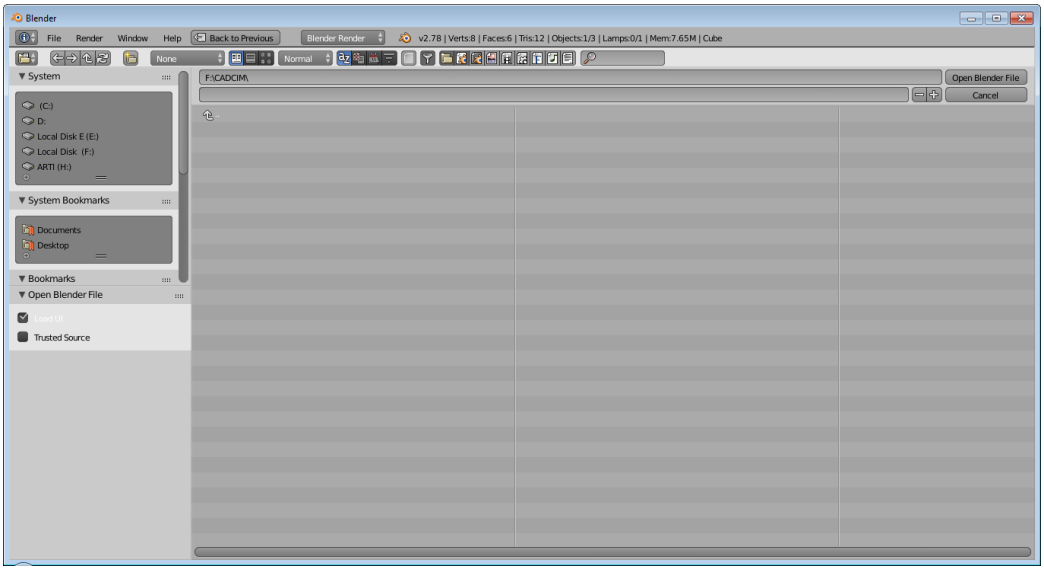

Figure 1-19 The ***File Browser***

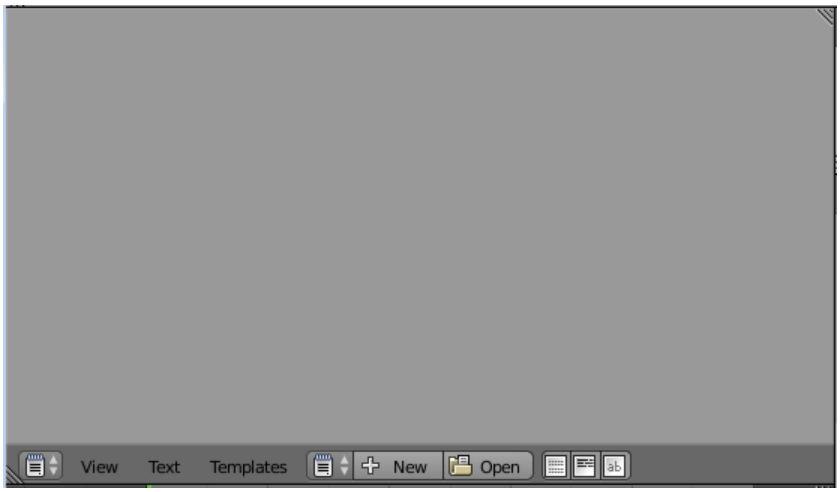

Figure 1-20 The ***Text Editor***

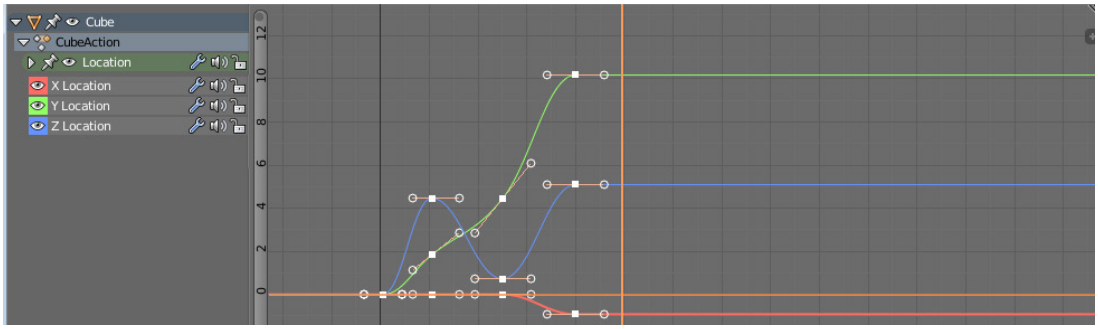

Figure 1-21 The ***Graph Editor***

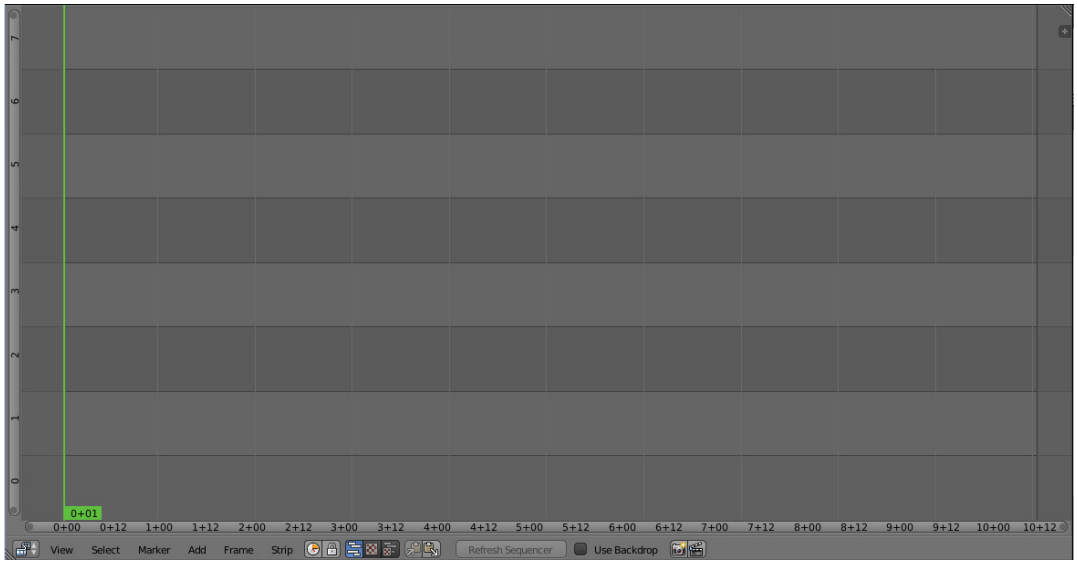

Figure 1-22 The ***Video Sequence Editor***

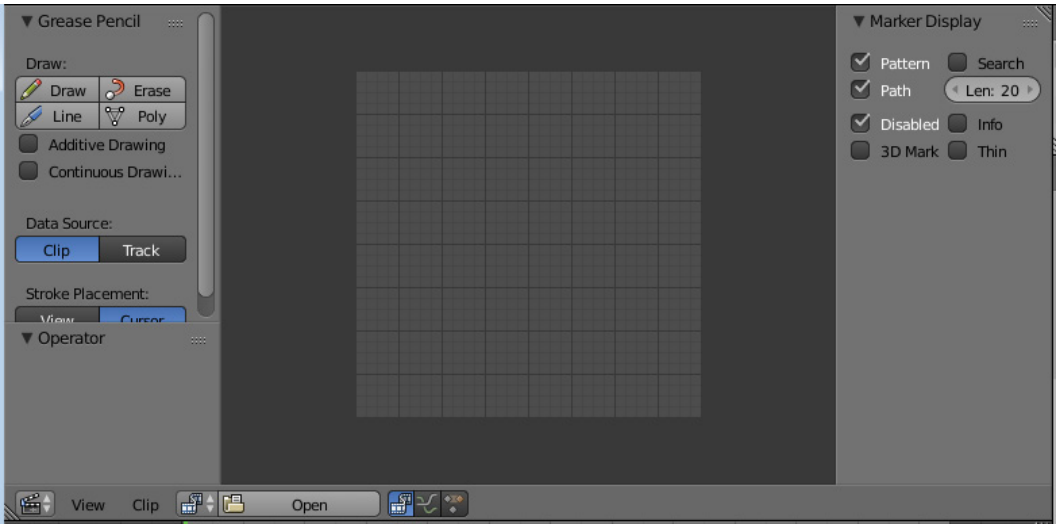

Figure 1-23 The ***Movie Clip Editor***

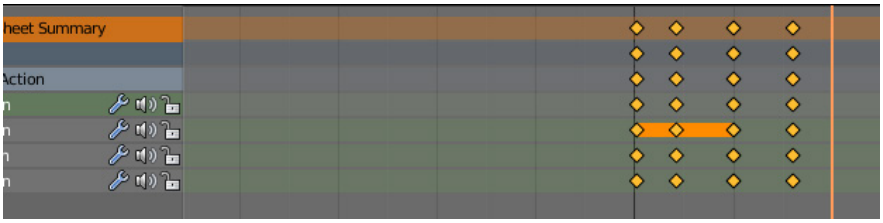

Figure 1-24 The ***Dope Sheet***

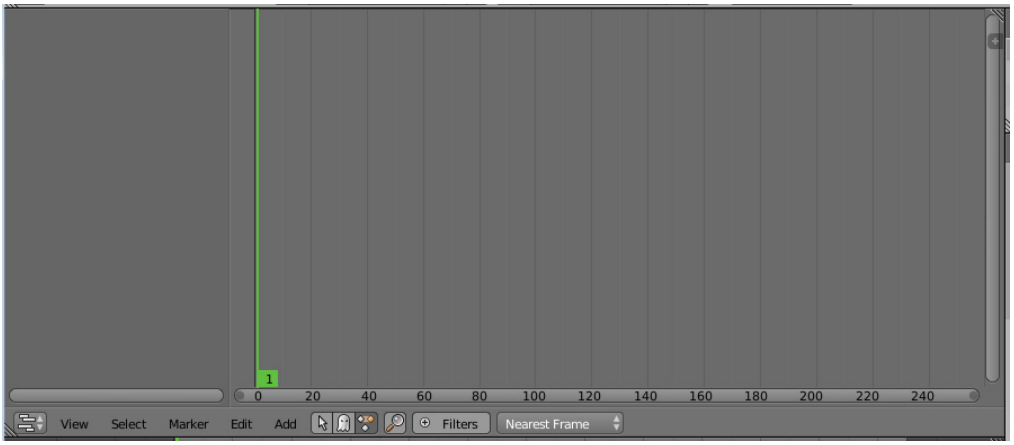

Figure 1-25 The ***NLA Editor***

Figure 1-26 The ***Logic Editor***

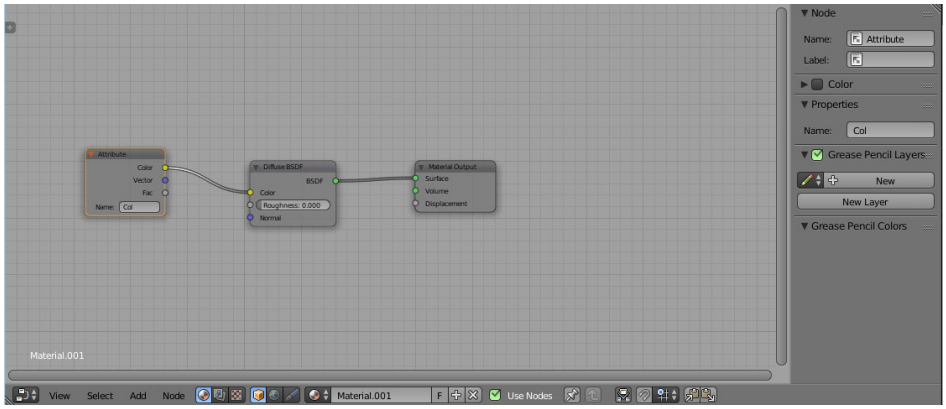

Figure 1-27 The ***Node Editor***

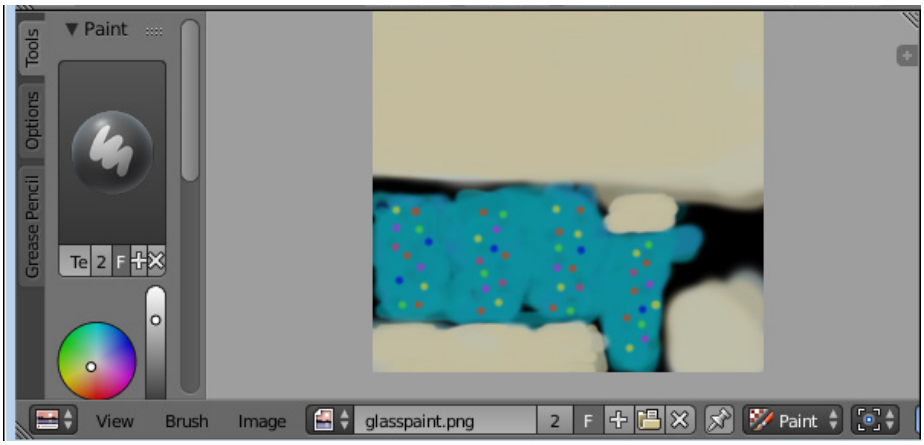

Figure 1-28 The ***UV/Image Editor***

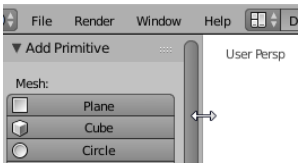

Figure 1-29 *Resizing the editors*

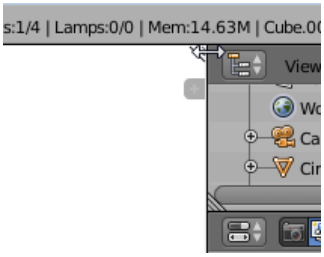

Figure 1-30 *Double-headed arrow on the splitter widget*

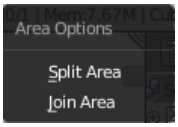

Figure 1-31 *The menu displayed*

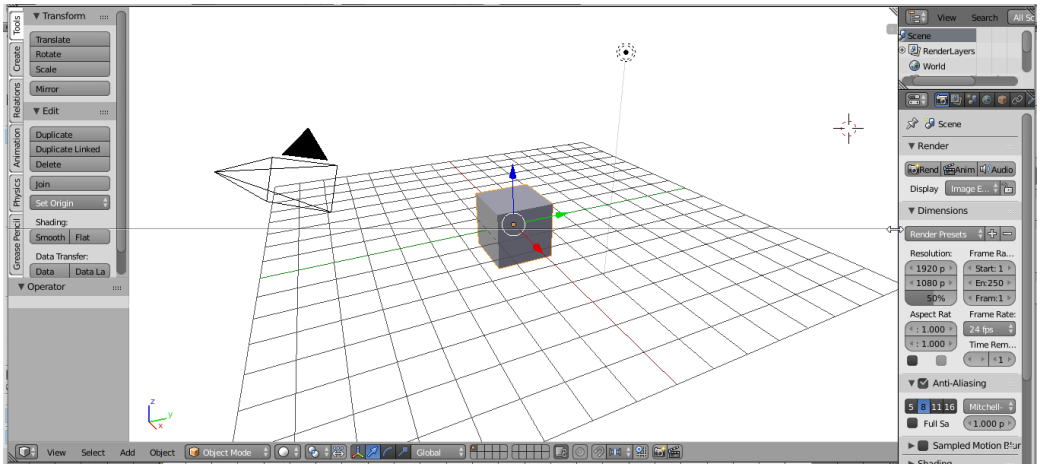

Figure 1-32 *Splitting the editor*

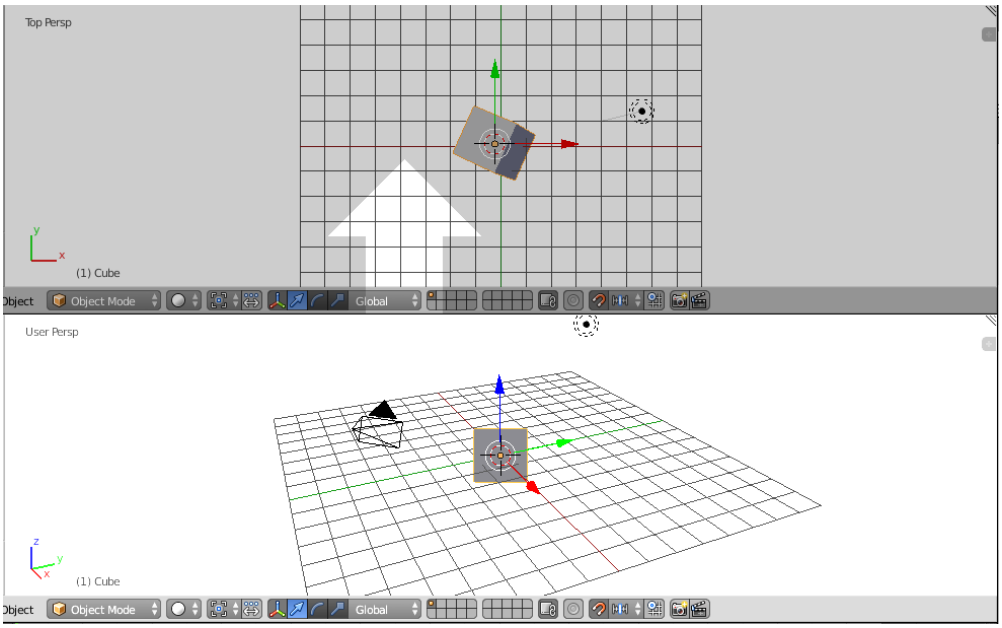

Figure 1-33 Joining the editors

*Figure 1-34 The **Blender User Preferences** dialog box*

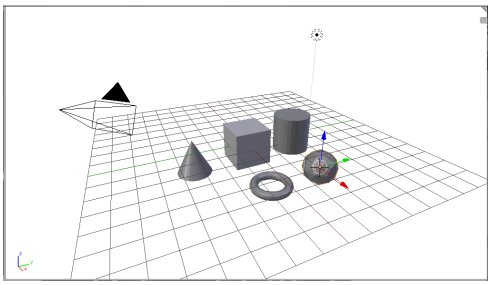

Figure 1-35 *The scene displayed*

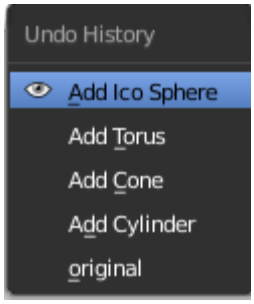

Figure 1-36 *The* ***Undo History*** *menu*

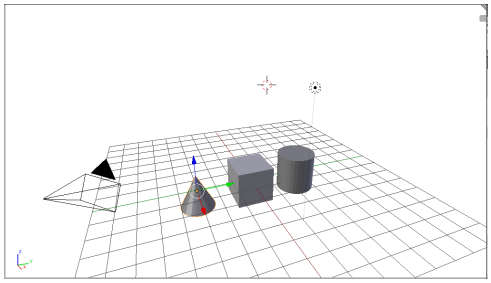

Figure 1-37 *The modified scene*

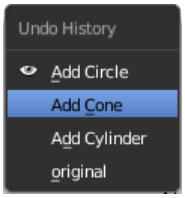

Figure 1-38 *The modified menu*

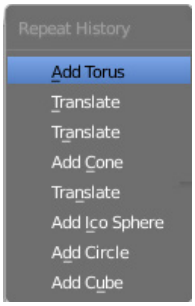

Figure 1-39 *The* ***Repeat History*** *menu*

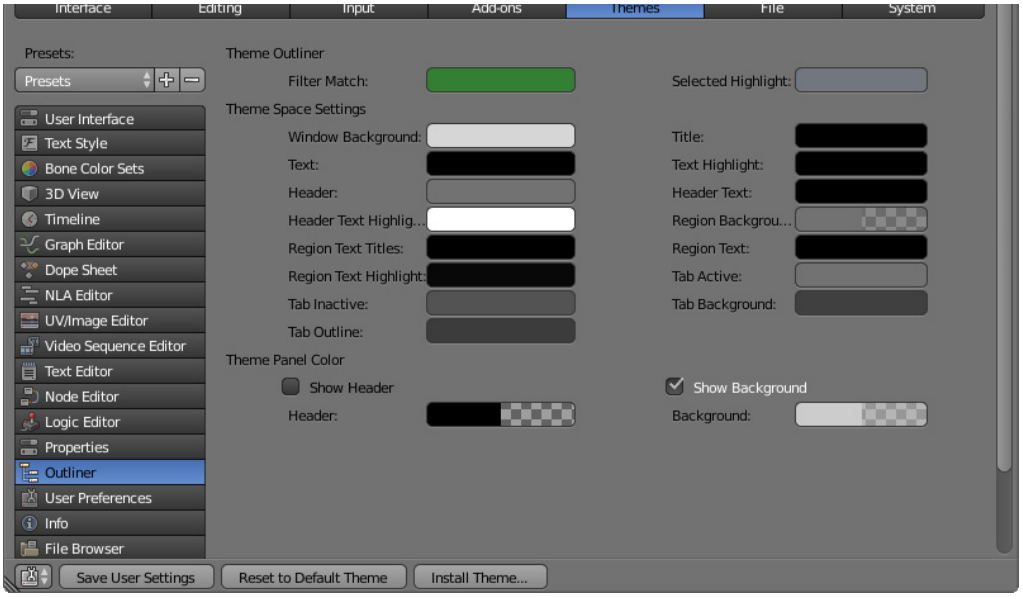

Figure 1-40 *The* ***Blender User Preferences*** *dialog box*

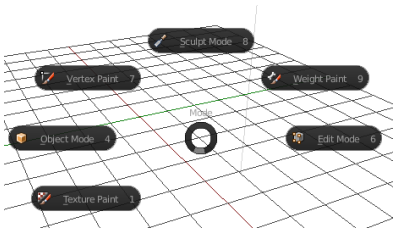

Figure 1-41 *The* ***Mode*** *pie menu*

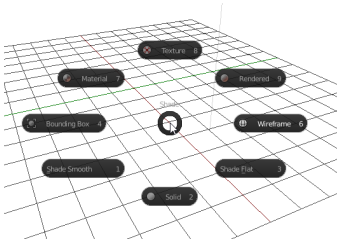

Figure 1-42 *The* ***Shading*** *pie menu*

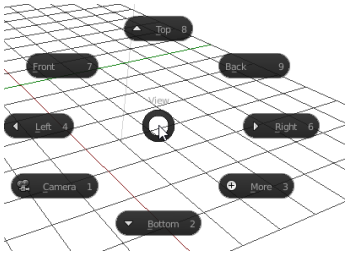

Figure 1-43 *The* ***View*** *pie menu*

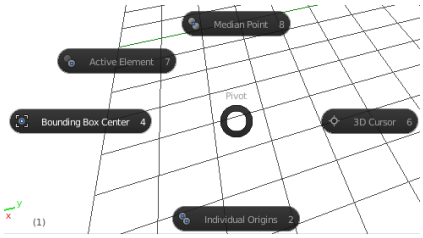

Figure 1-44 *The* ***Pivot*** *pie menu*

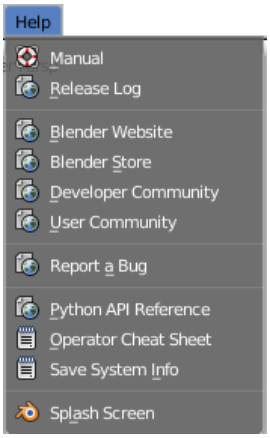

Figure 1-45 *The options in the* ***Help*** *menu*

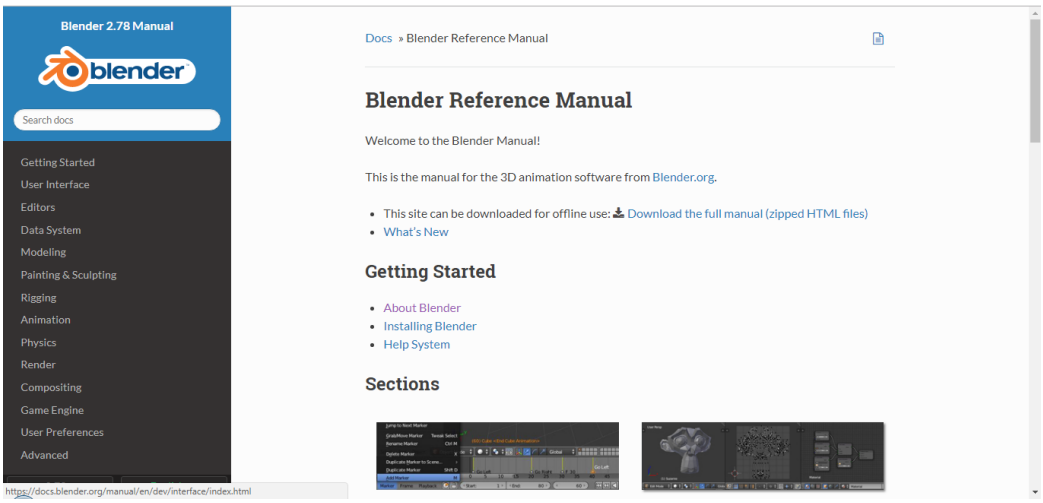

Figure 1-46 *The* ***Blender Reference Manual*** *window*

Chapter 2

Working with Mesh Primitives

Learning Objectives

After completing this chapter, you will be able to:

- *Understand viewport navigation controls*
- *Understand selection techniques*
- *Understand the Object and Edit modes*
- *Create and edit mesh primitives*
- *Understand the proportional editing*
- *Change the object color and the background color of a scene*
- *Render a still image*

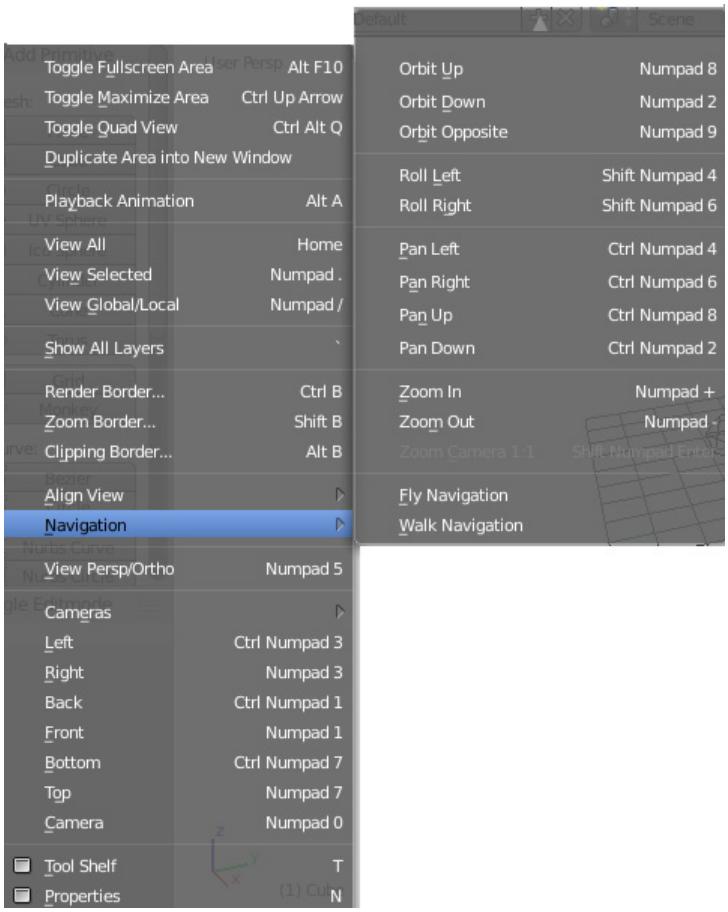

Figure 2-1 *The cascading menu displayed*

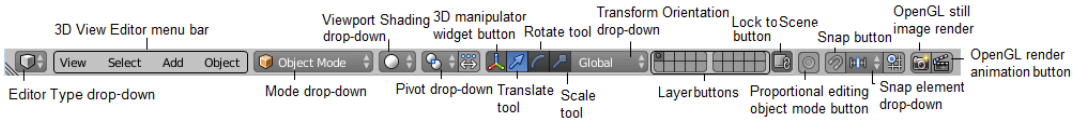

Figure 2-2 *Various parameters in* ***3D View Editor***

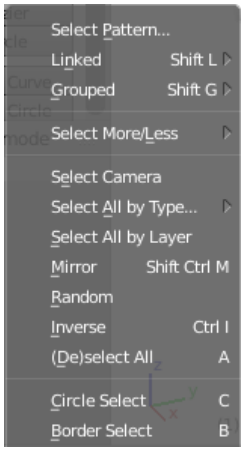

Figure 2-3 *The* ***Select*** menu

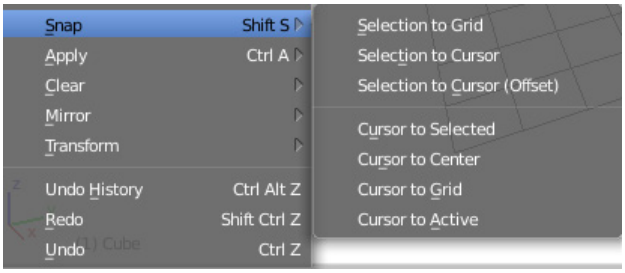

Figure 2-4 *The cascading menu displayed*

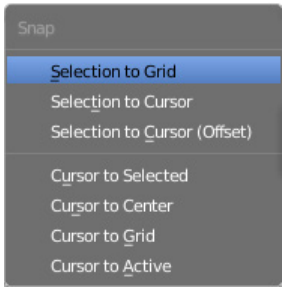

Figure 2-5 *The* ***Snap*** *menu*

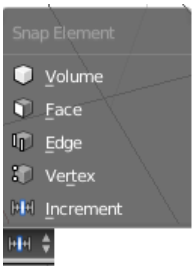

Figure 2-6 *The* ***Snap Element*** *drop-down*

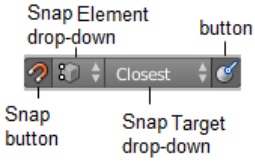

Figure 2-7 *The* ***Snap Target*** *drop-down and a button added*

Figure 2-8 *The* ***Snap Target*** *drop-down*

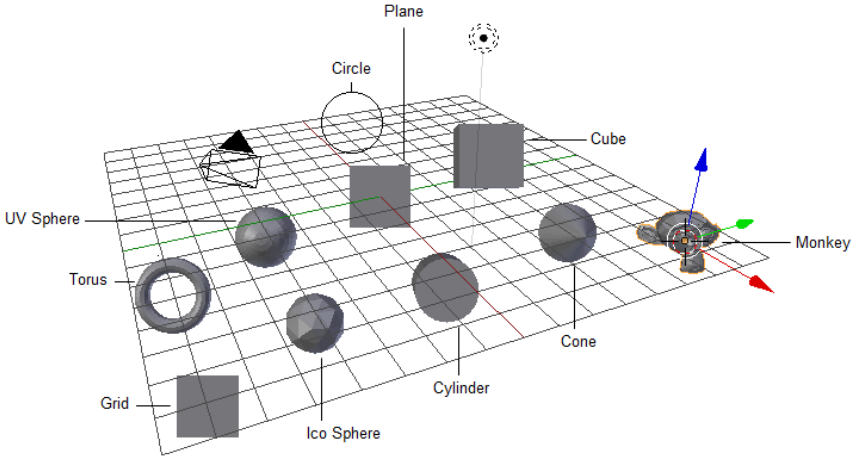

Figure 2-9 *The mesh primitives available in Blender*

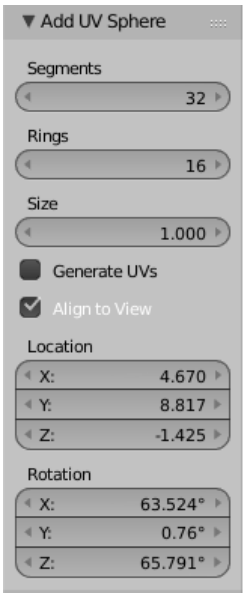

Figure 2-10 *The* ***Add UV Sphere*** *panel*

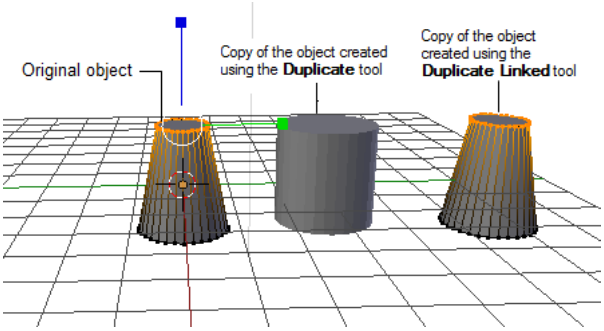

Figure 2-11 *The objects copied using the* ***Duplicate*** *and* ***Duplicate Linked*** *tools*

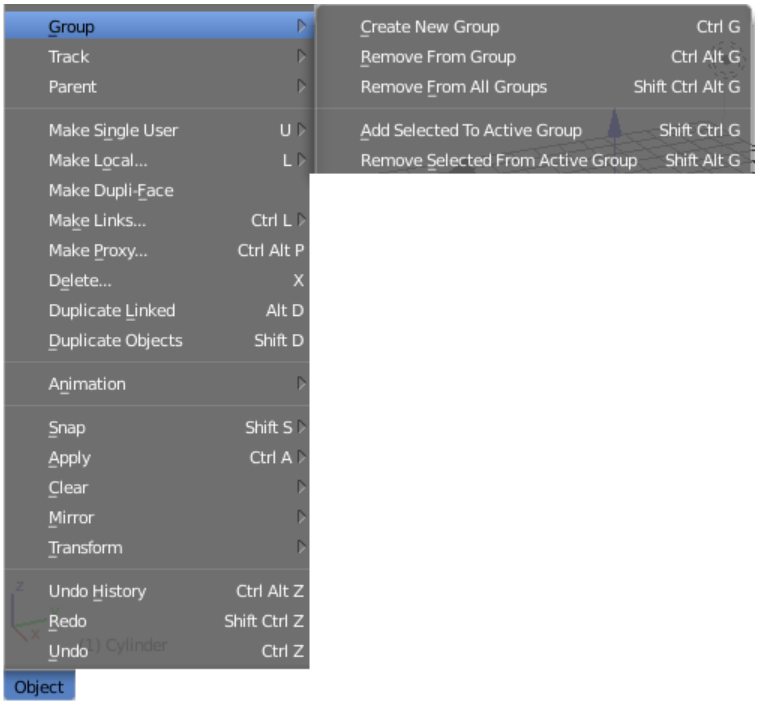

Figure 2-12 *The cascading menu displayed*

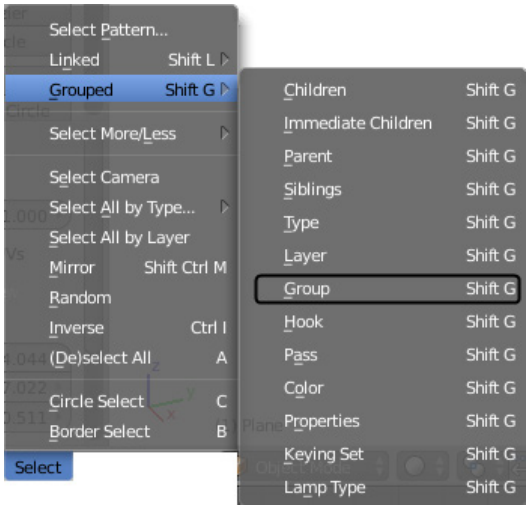

Figure 2-13 *Choosing* ***Group*** *from the cascading menu displayed*

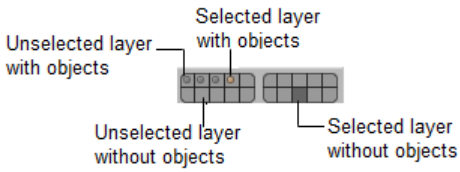

Figure 2-14 *Various layer buttons*

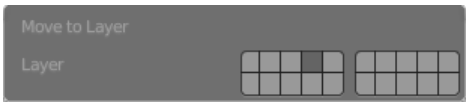

Figure 2-15 *The* ***Move to Layer*** menu

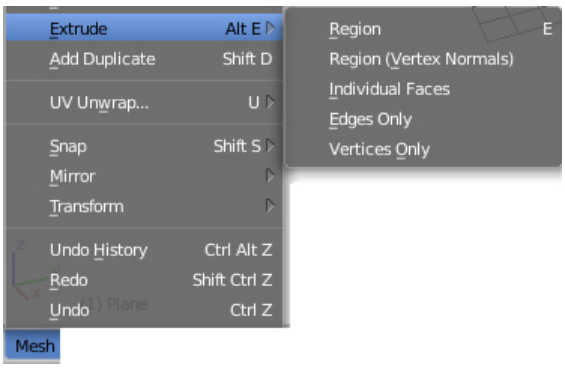

Figure 2-16 *Various extrude options in the cascading menu*

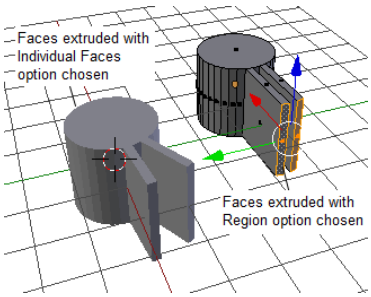

Figure 2-17 *Faces extruded using the* ***Individual Faces*** *and the* ***Region*** *option*

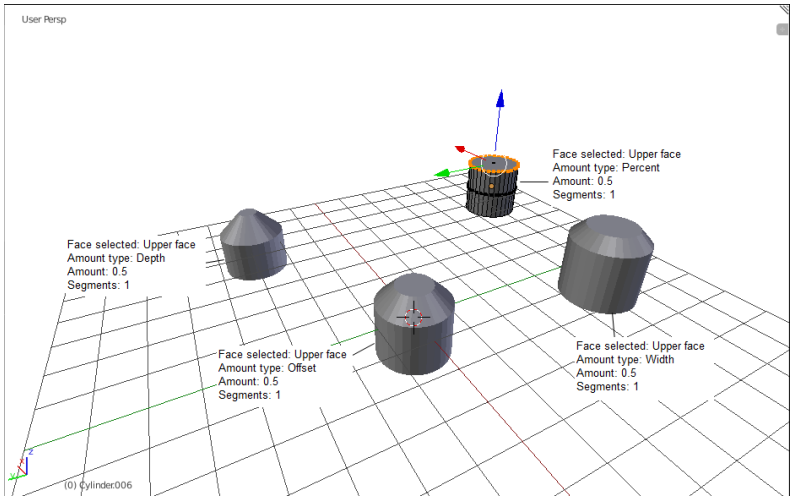

Figure 2-18 *Upper face of a cylinder with various bevel amount types*

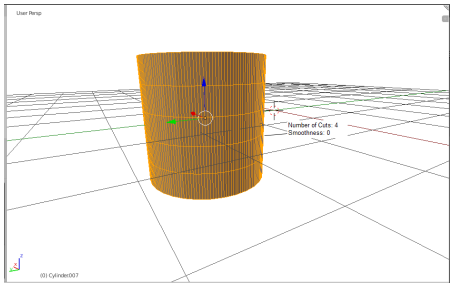

Figure 2-19 *The subdivision of edges with* ***Smoothness = 0***

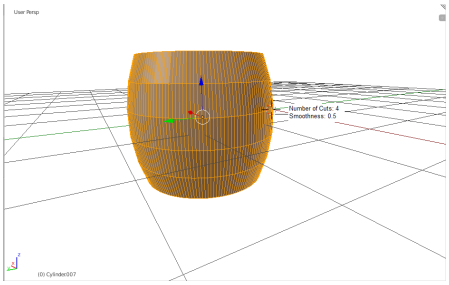

Figure 2-20 *The subdivision of edges with* ***Smoothness = 0.5***

Figure 2-21 *The* ***Proportional Editing Falloff*** *drop-down*

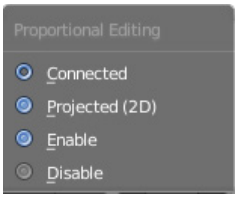

Figure 2-22 *The* ***Proportional editing mode*** *drop-down*

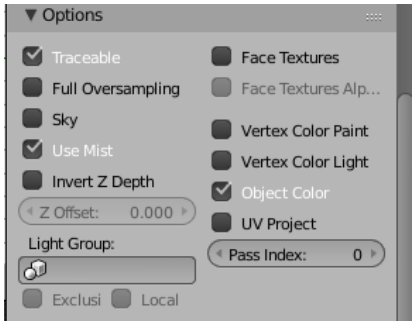

Figure 2-23 *The* ***Object Color*** *check box selected*

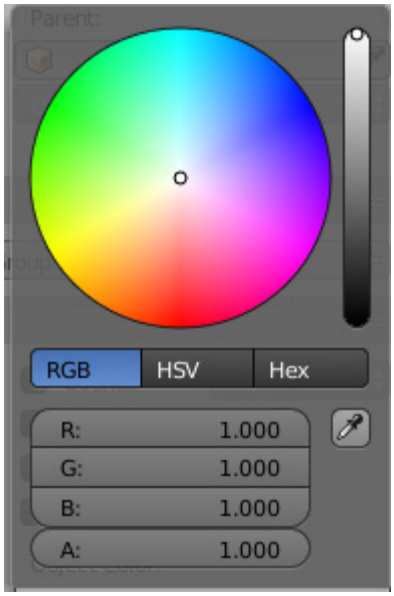

Figure 2-24 *The Color Picker window*

Figure 2-25 *The* ***Horizon Color*** *swatch*

Figure 2-26 *The model of a TV unit*

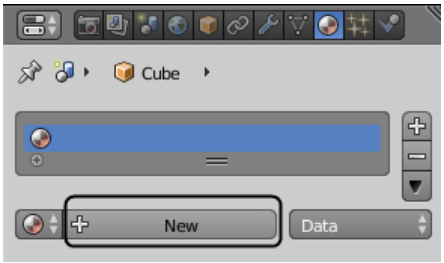

Figure 2-27 *Choosing the* ***New*** *button*

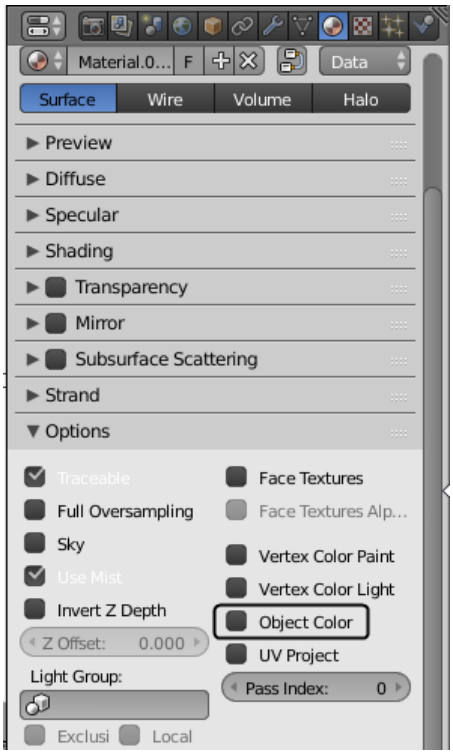

Figure 2-28 *The* ***Object Color*** *check box in the* ***Options*** *Panel*

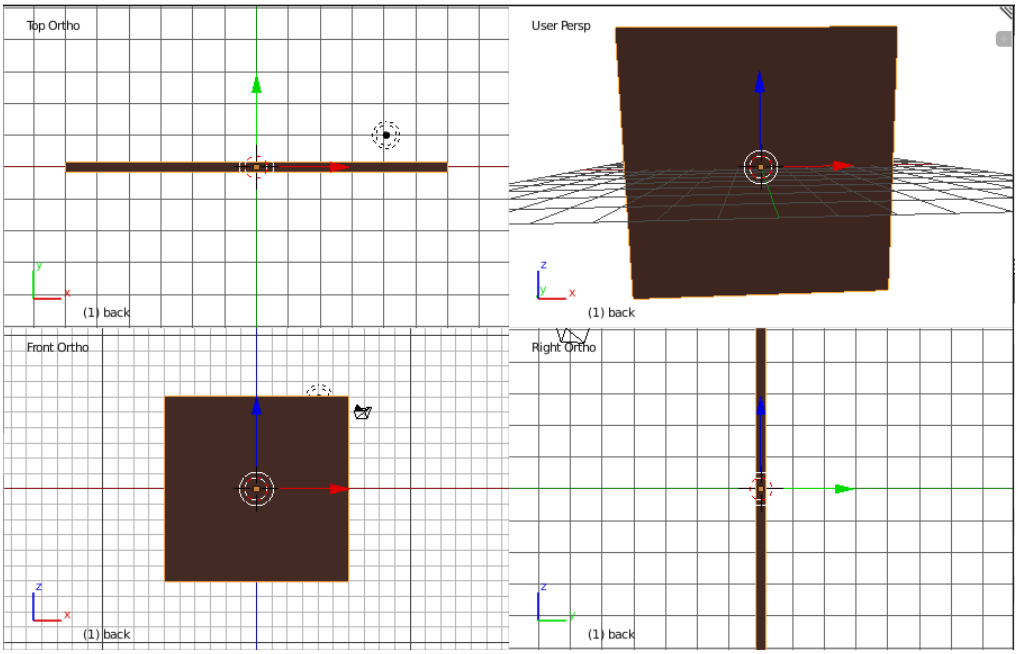

Figure 2-29 *The back of the TV unit*

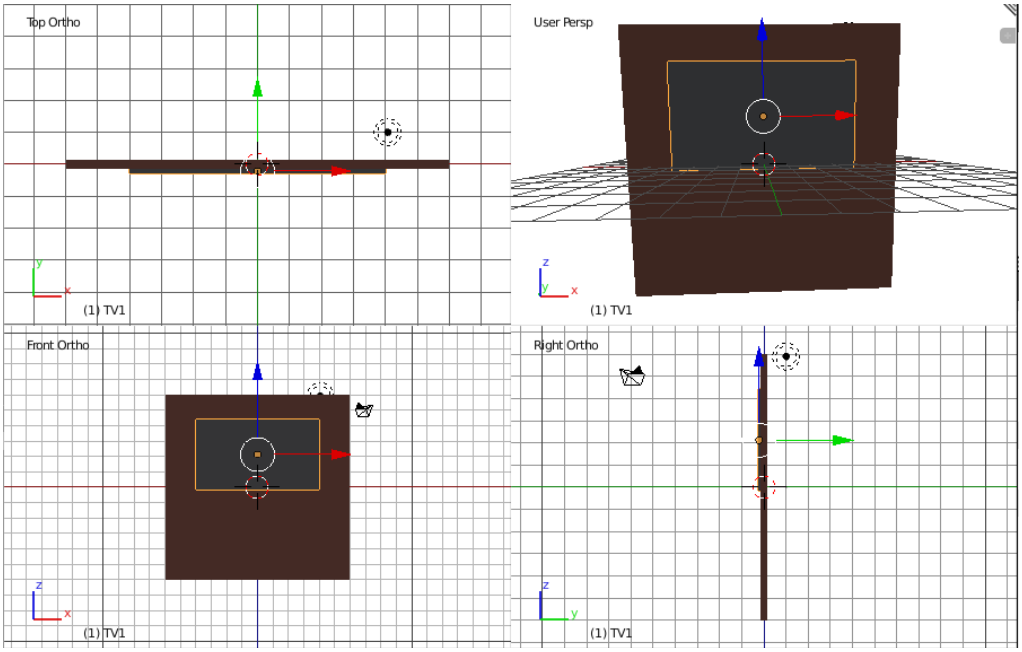

Figure 2-30 *The TV1 aligned*

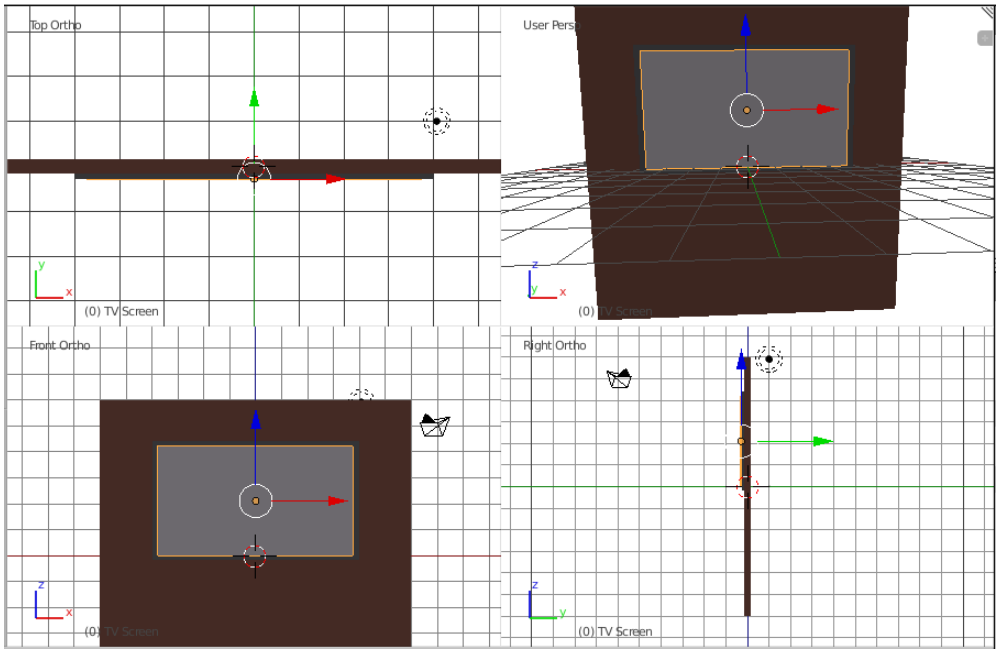

Figure 2-31 *The TV Screen aligned*

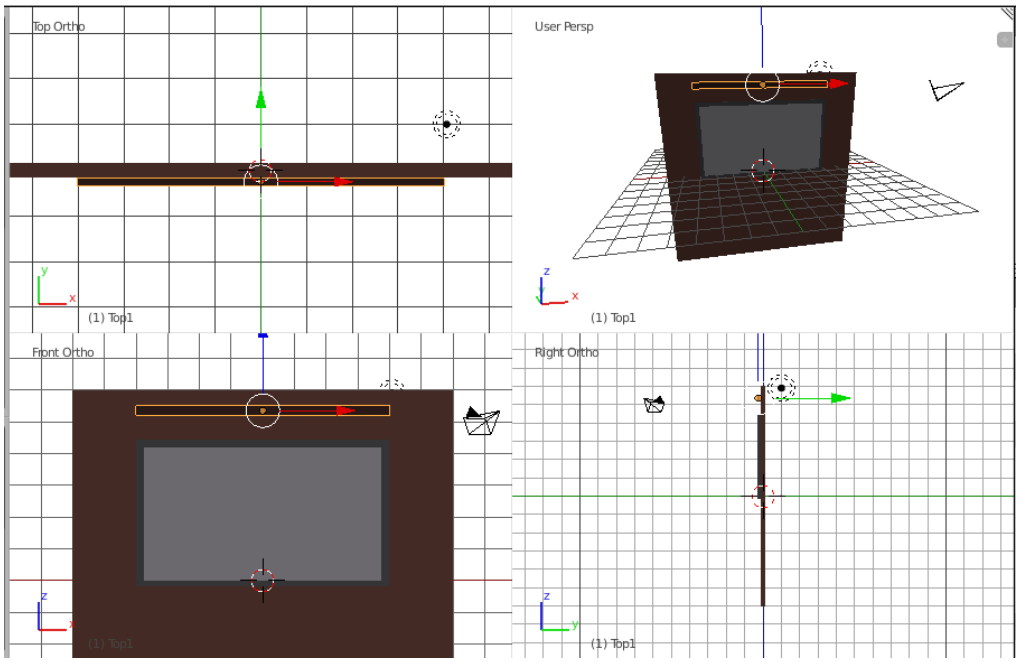

Figure 2-32 *The Top1 aligned*

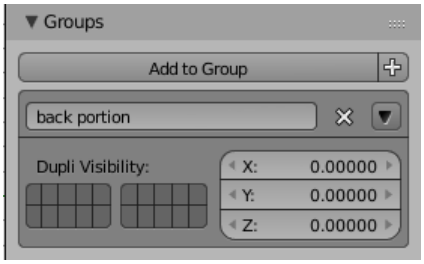

Figure 2-33 *The* ***Groups*** *panel*

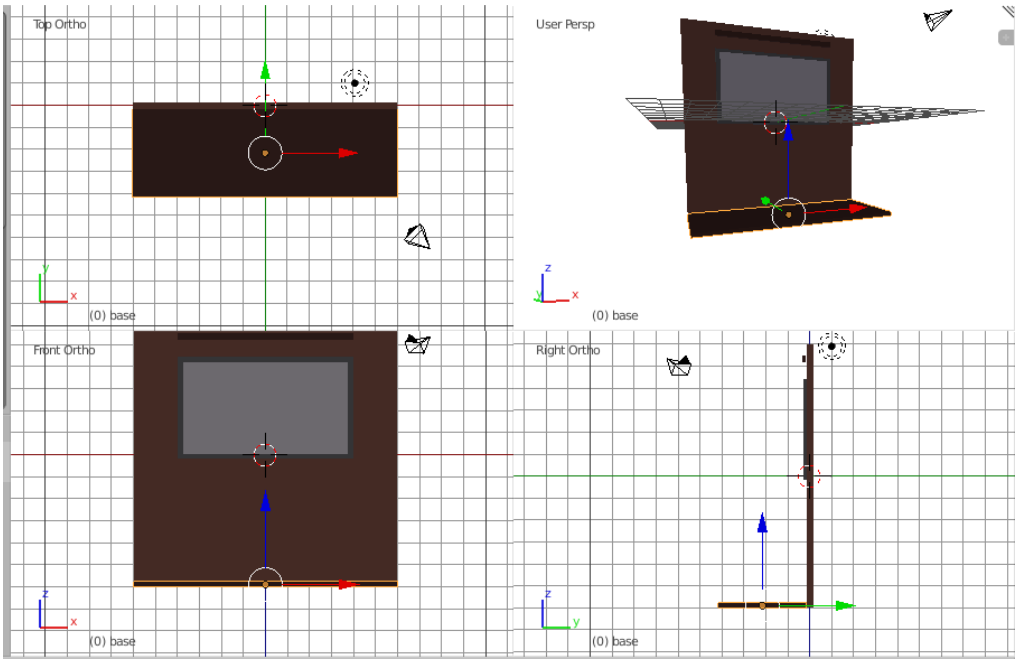

Figure 2-34 *The base aligned*

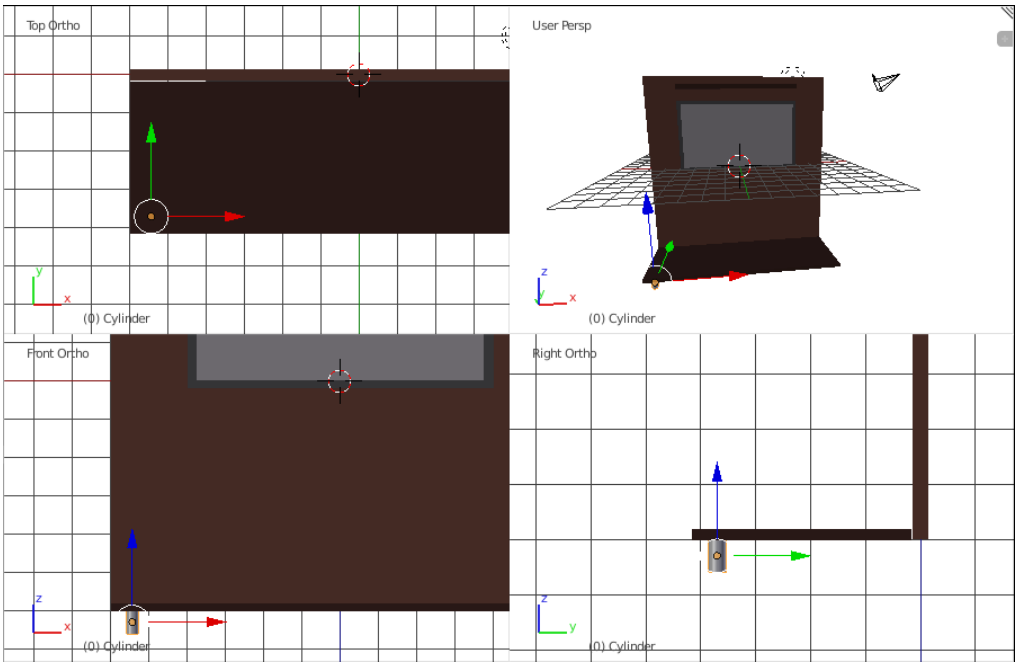

Figure 2-35 *The cylinder aligned*

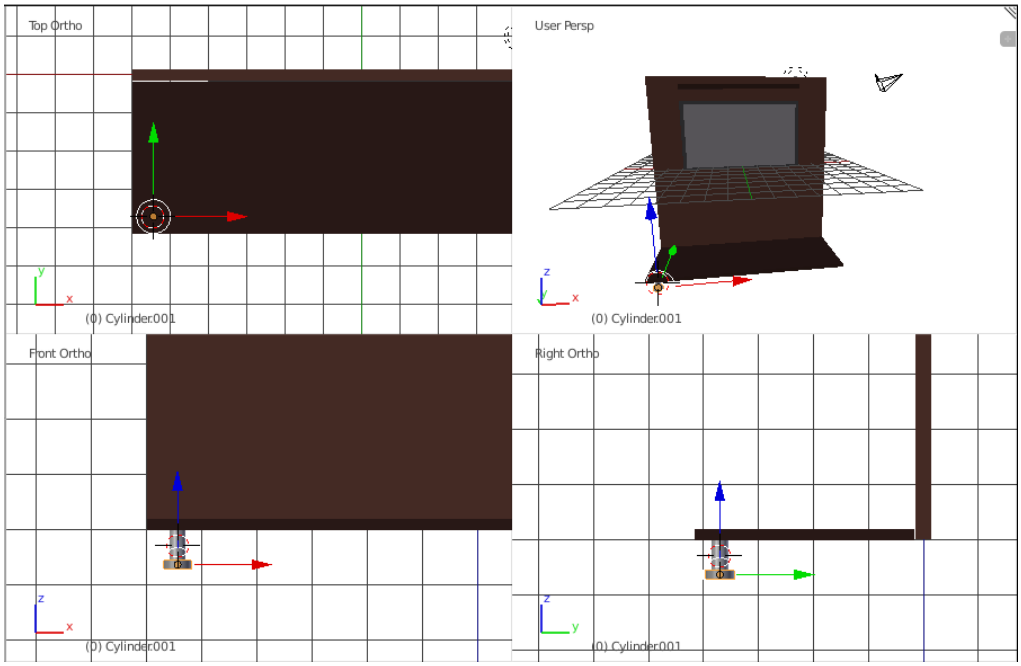

Figure 2-36 *The Cylinder001 moved*

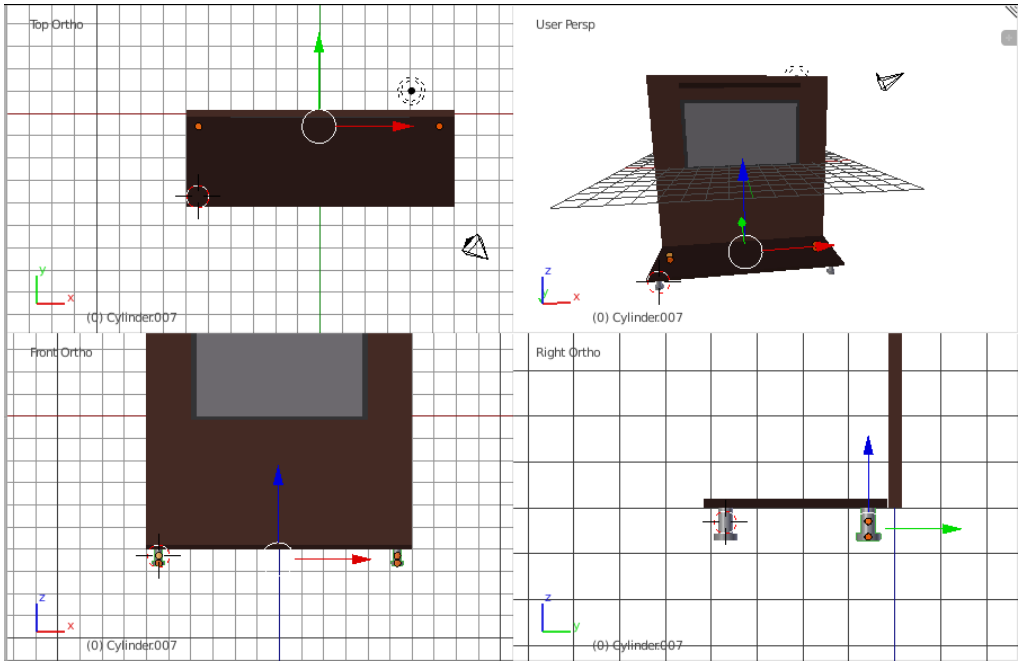

Figure 2-37 *All the copies of cylinder aligned*

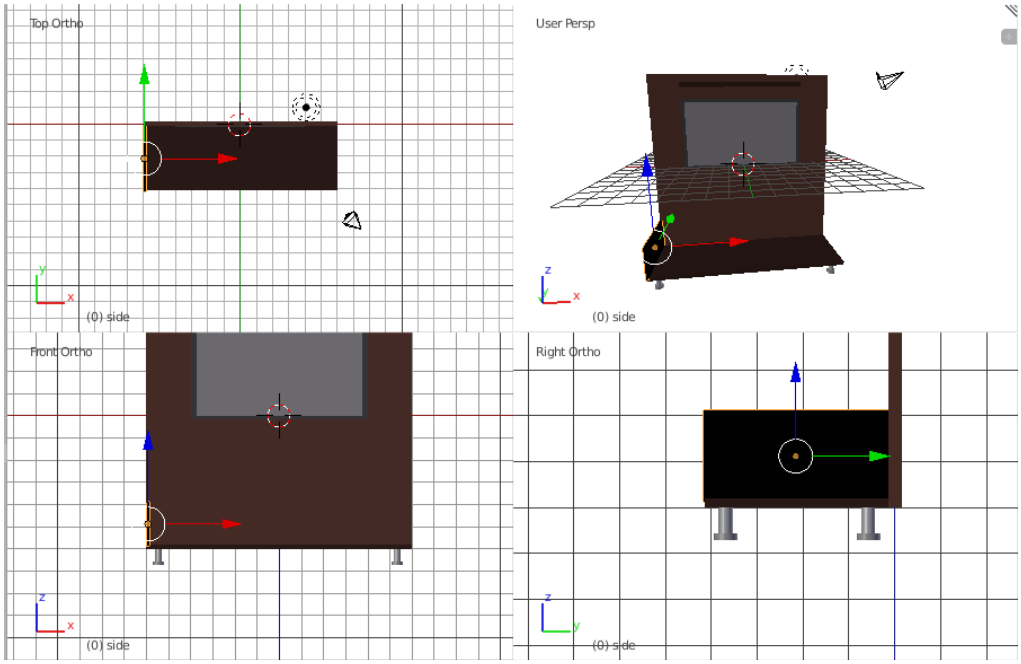

Figure 2-38 *The side aligned*

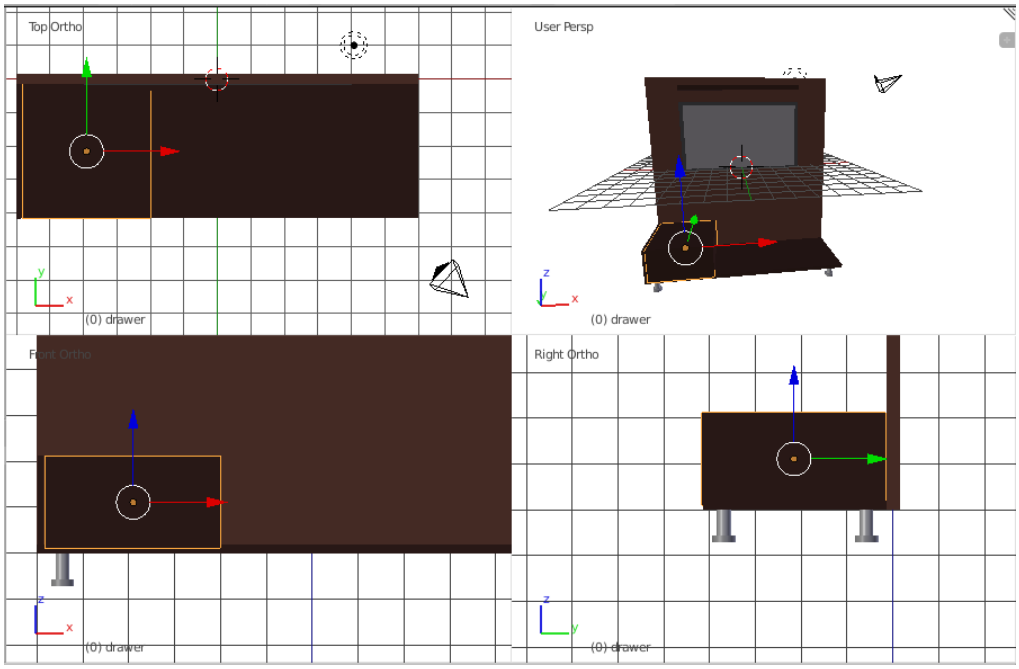

Figure 2-39 *The drawer aligned*

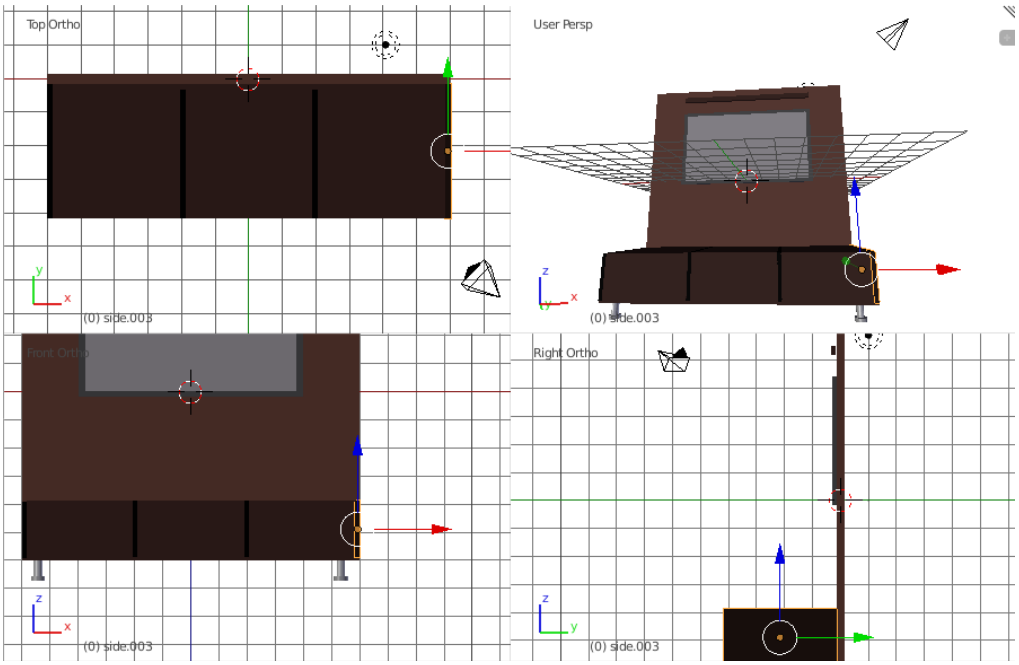

Figure 2-40 *All the copies of side and drawer aligned*

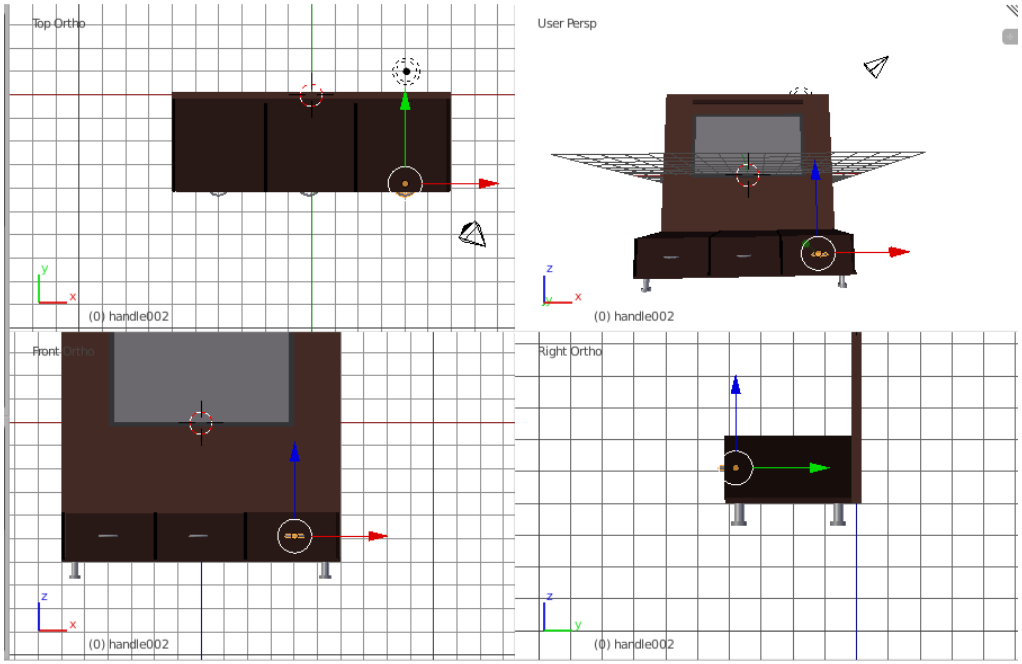

Figure 2-41 *The handle and its copies aligned*

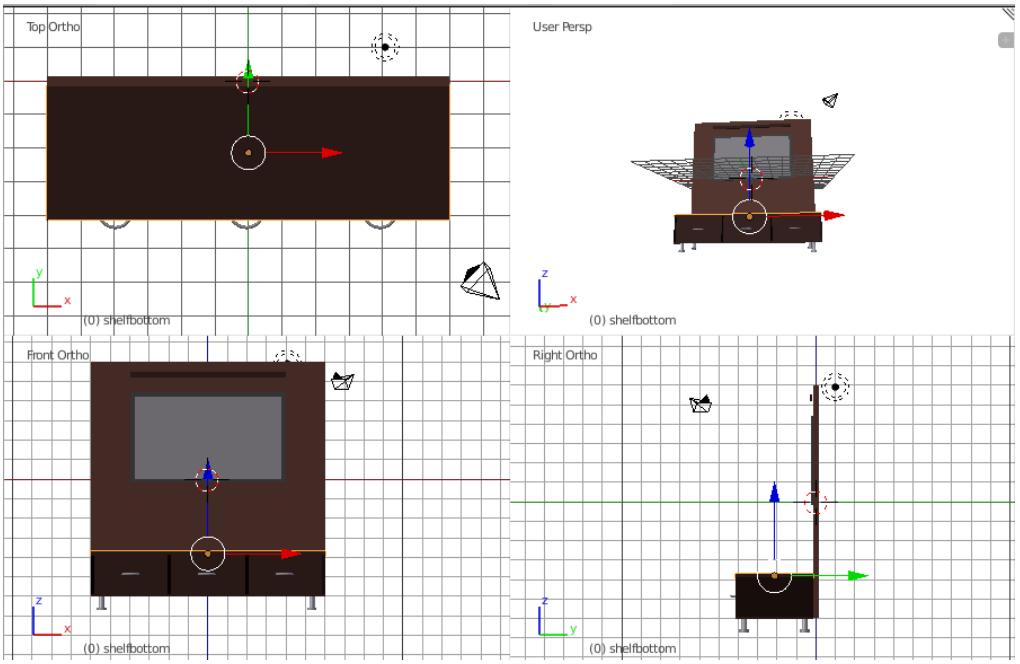

Figure 2-42 *The shelfbottom aligned*

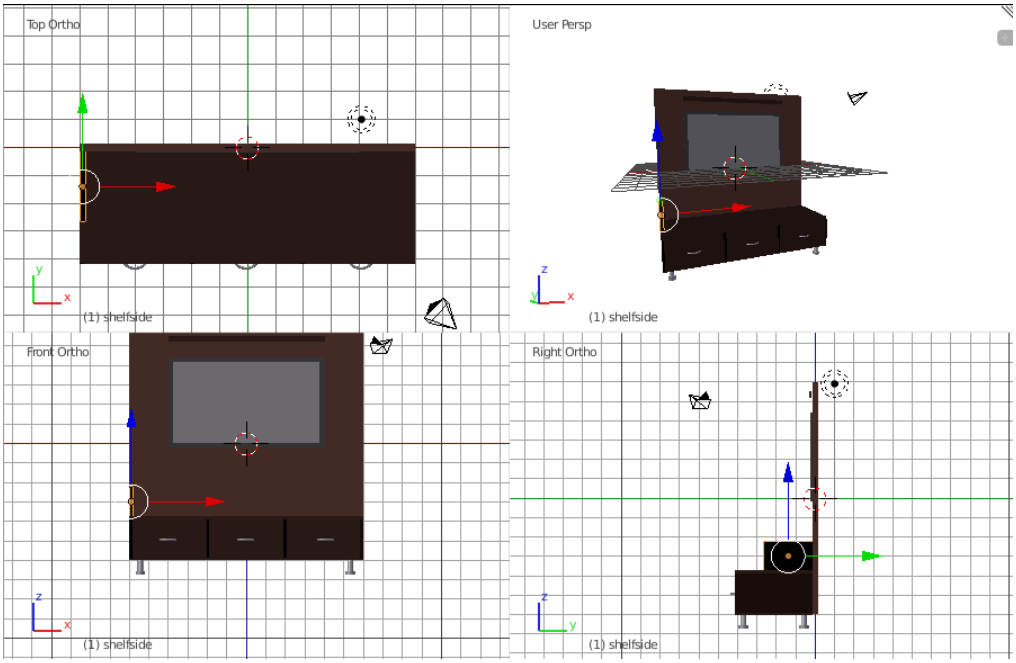

Figure 2-43 *The shelfside aligned*

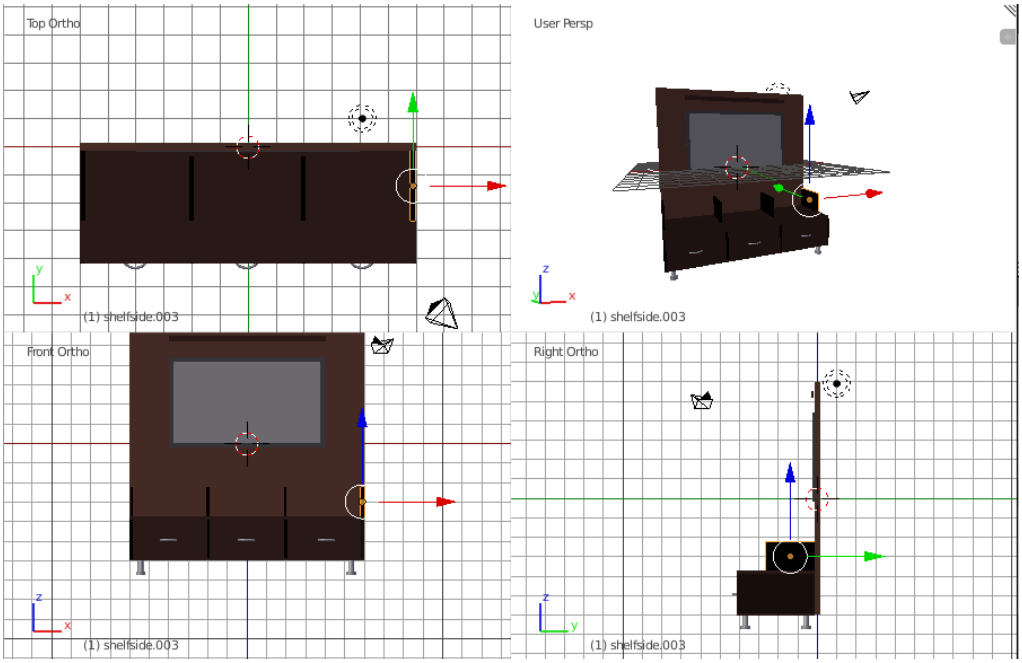

Figure 2-44 *The copies of shelfside aligned*

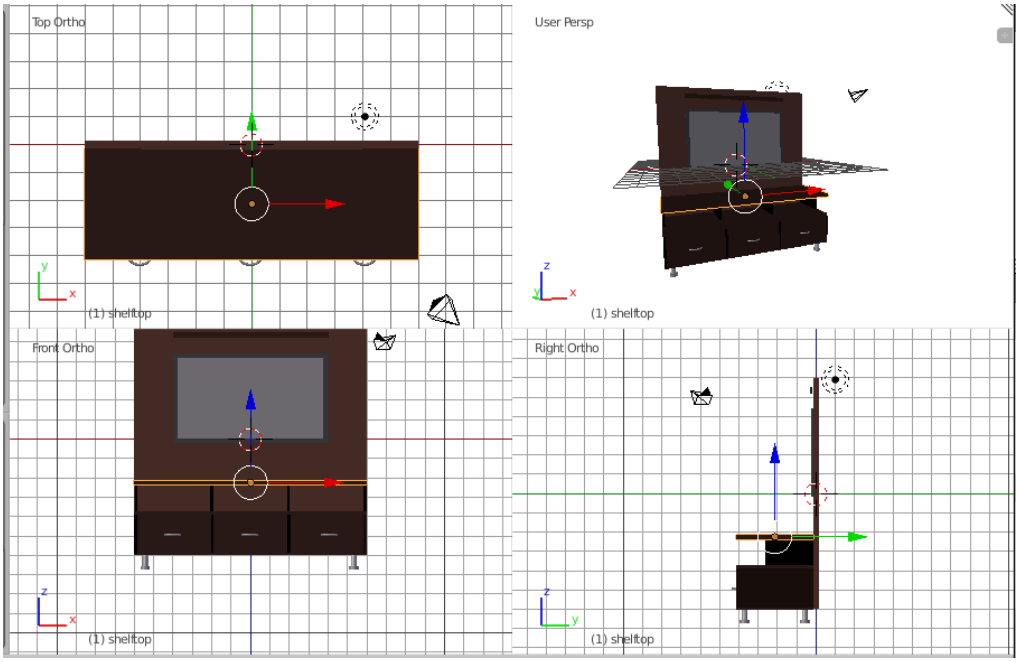

Figure 2-45 *The shelftop aligned*

Figure 2-46 *The Horizon Color swatch*

Figure 2-47 *The dining table set*

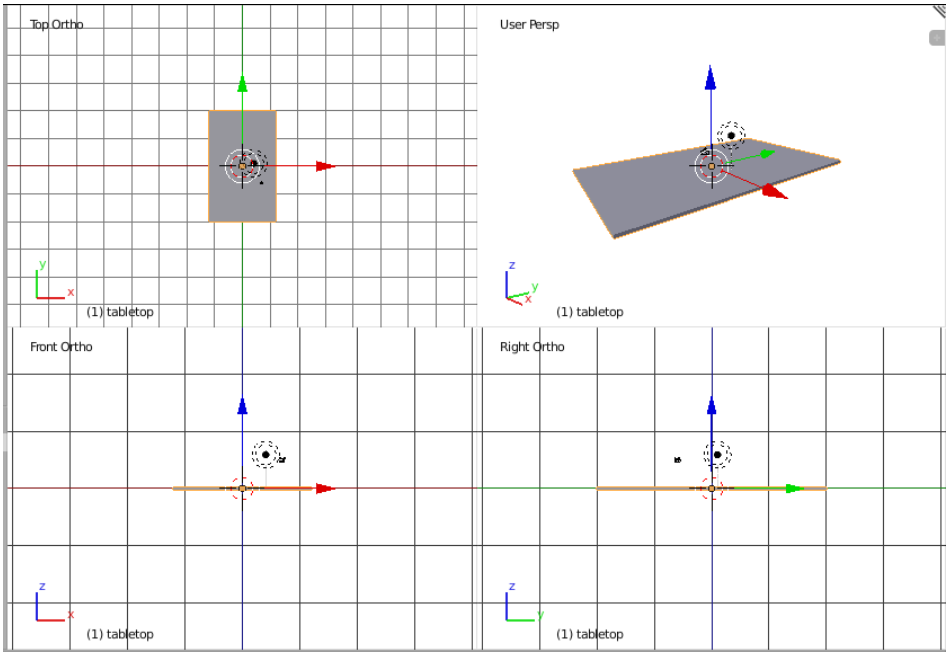

Figure 2-48 *The modified cube displayed*

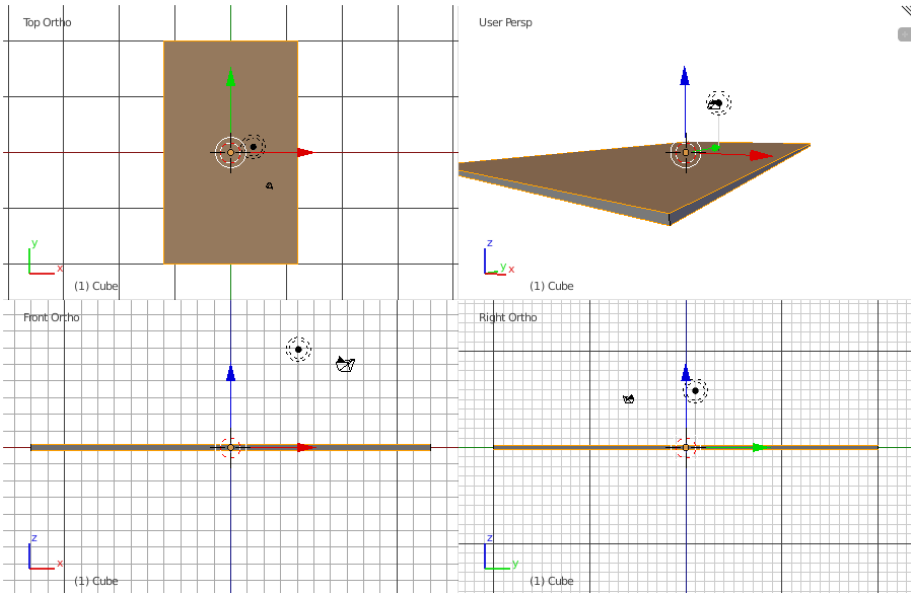

Figure 2-49 *All the corner edges deselected*

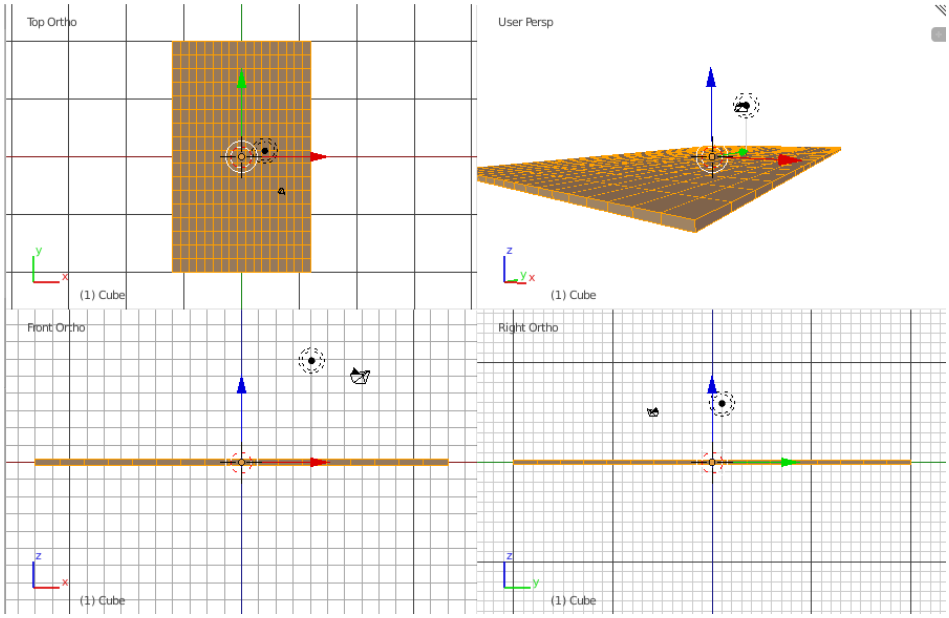

Figure 2-50 *The tabletop subdivided*

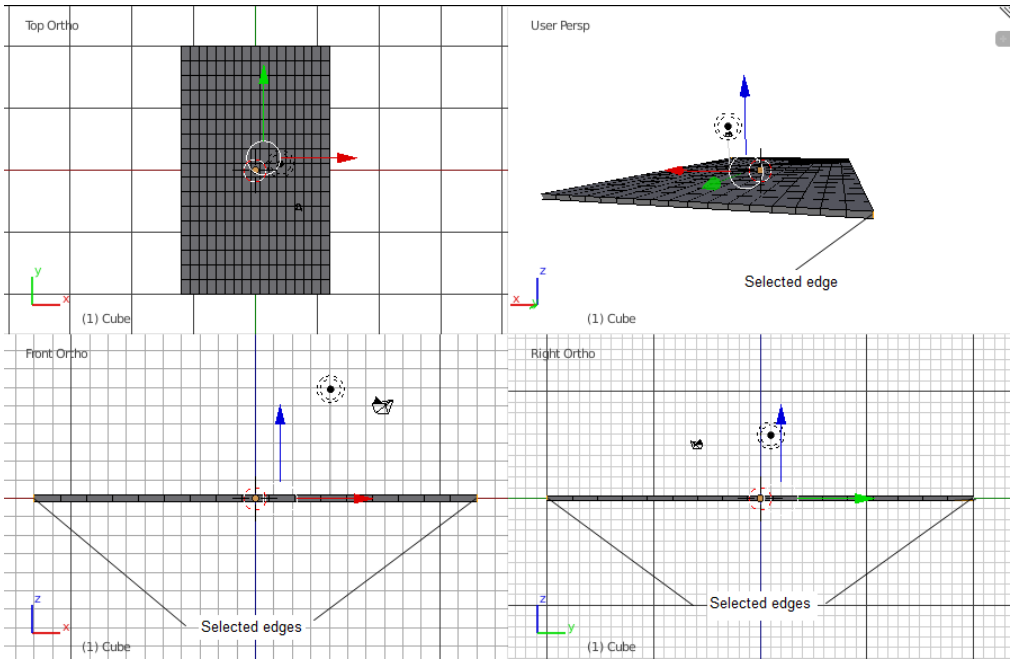

Figure 2-51 *Four corner edges selected*

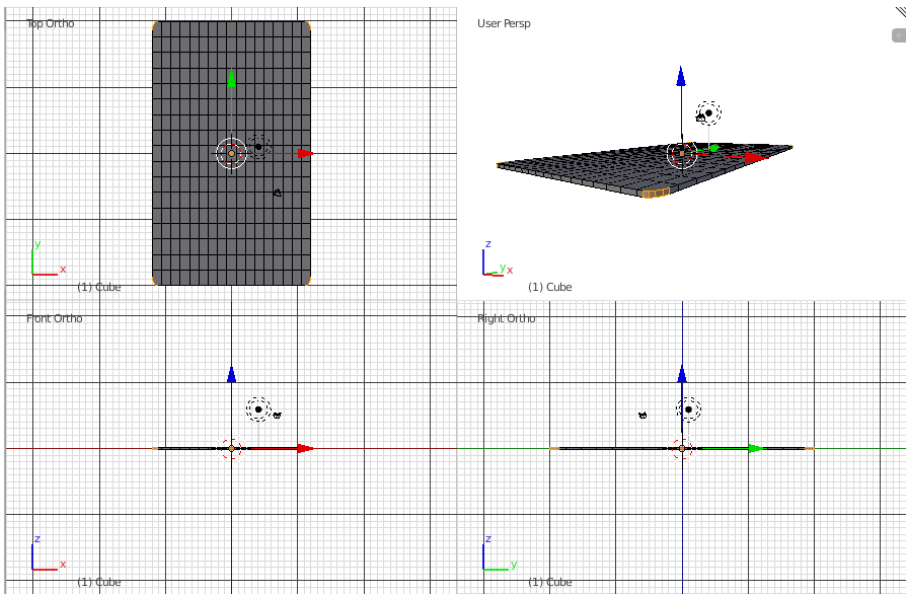

Figure 2-52 *The tabletop smoothened at the corners*

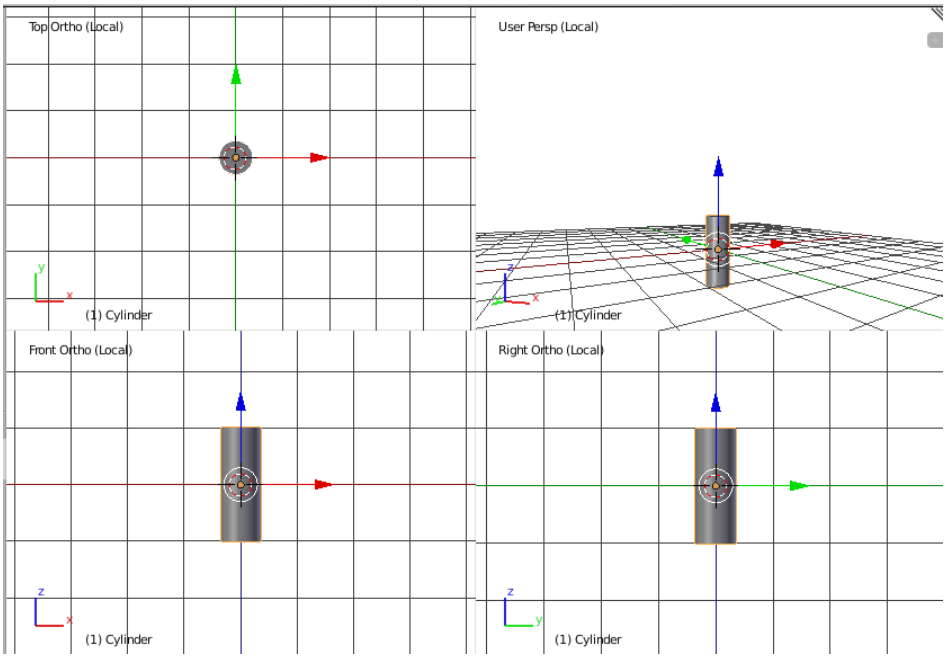

Figure 2-53 *The leg displayed*

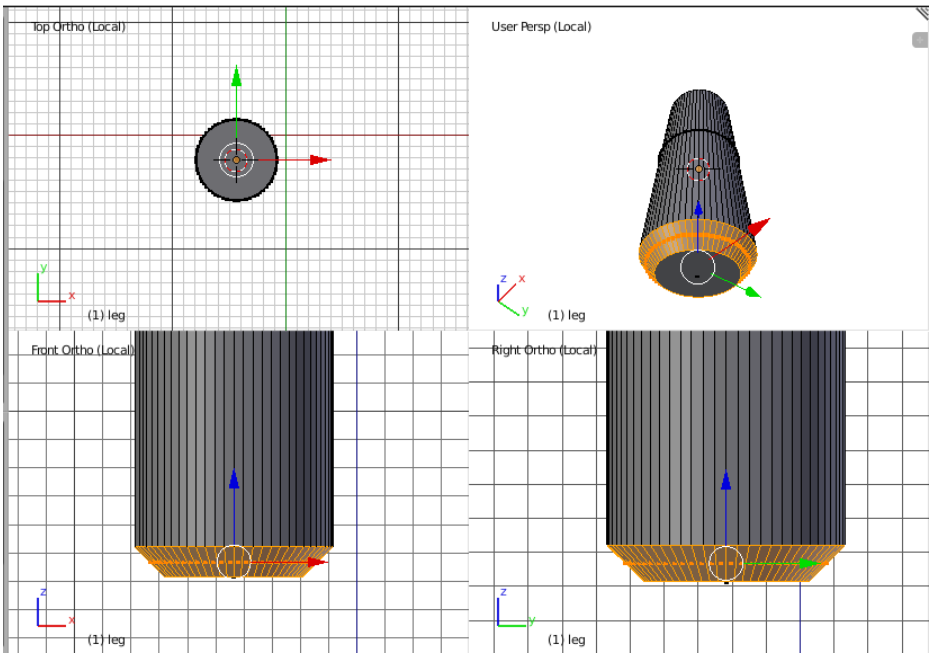

Figure 2-54 *The face of leg beveled*

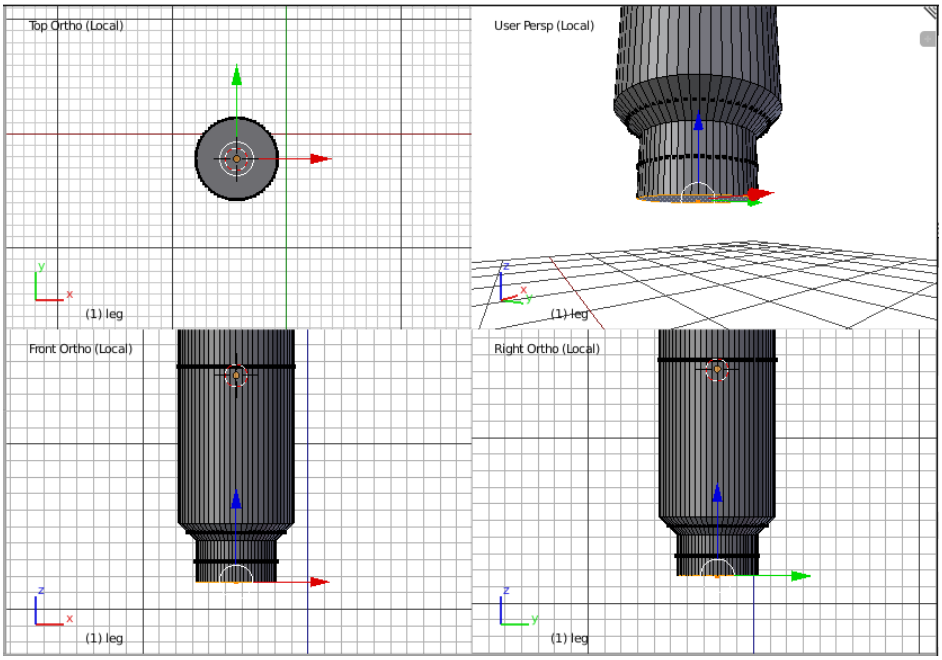

Figure 2-55 *The bottommost face extruded*

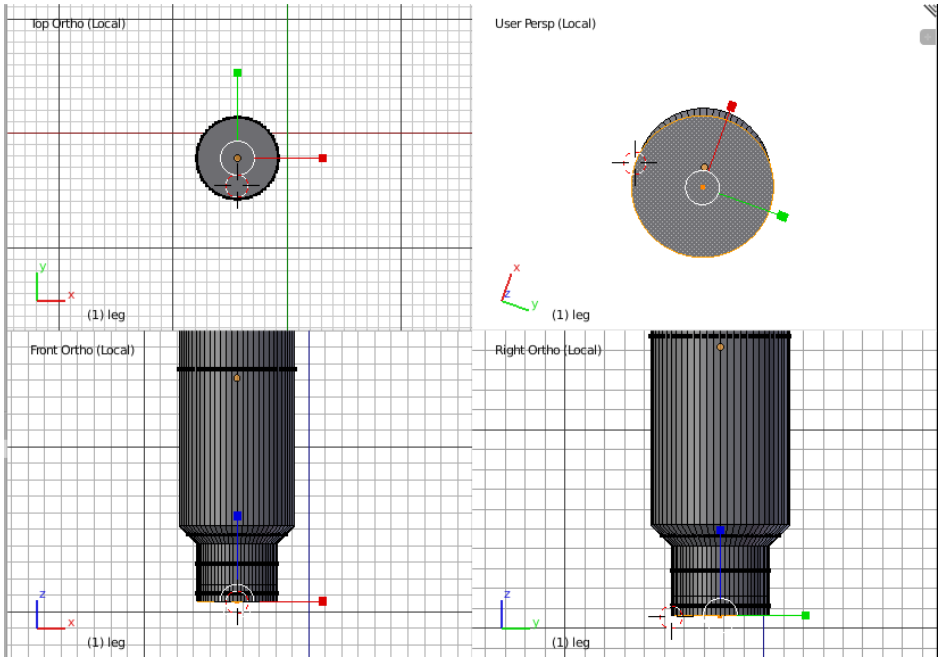

Figure 2-56 *The bottommost face extruded*

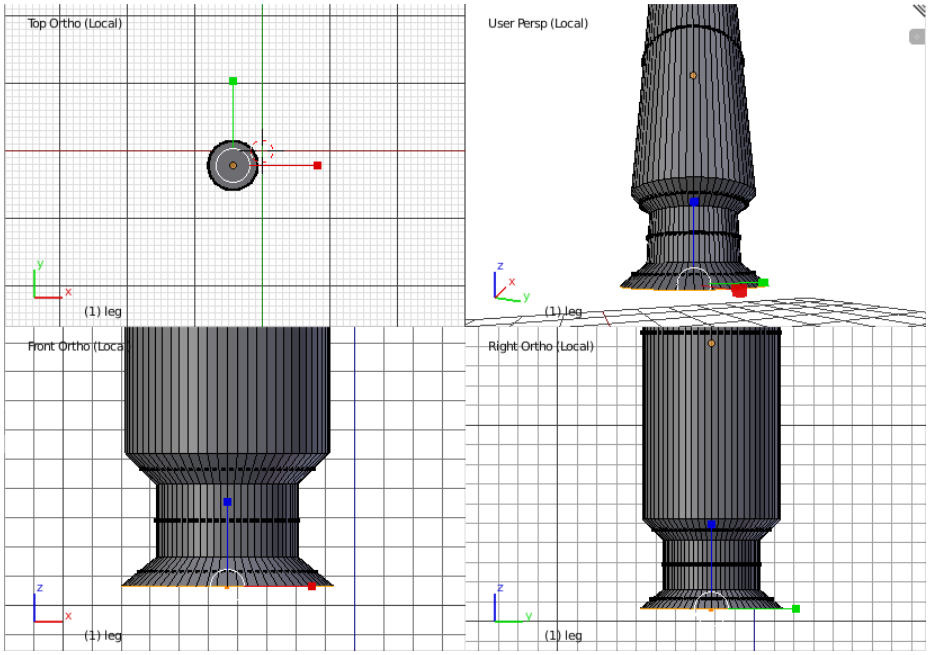

Figure 2-57 *The selected face scaled*

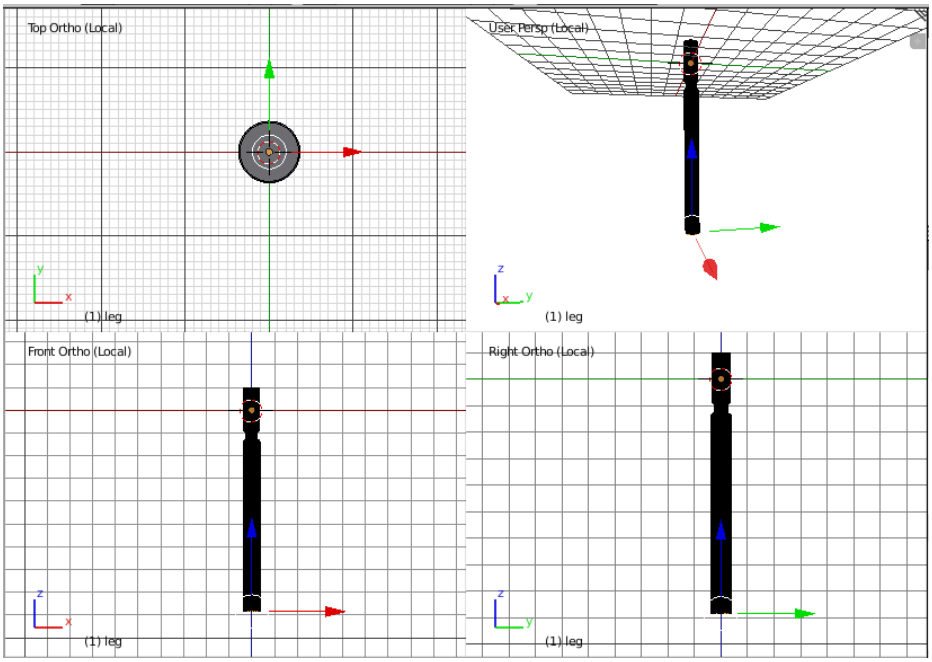

Figure 2-58 *The bottommost face extruded*

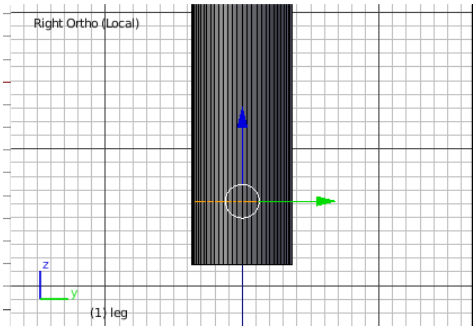

Figure 2-59 *The edge loop created*

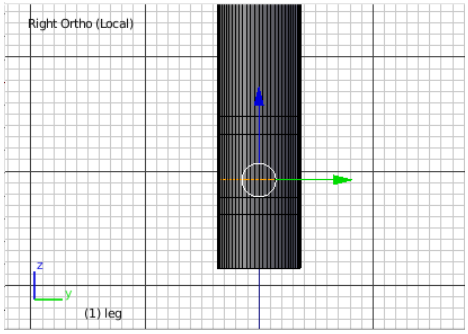

Figure 2-60 *Four edge loops created*

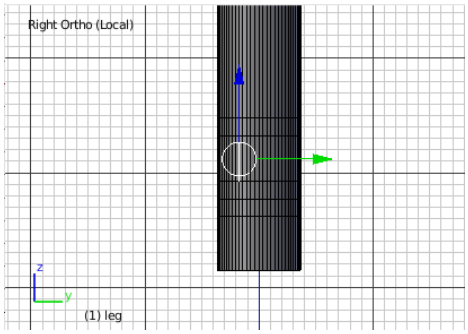

Figure 2-61 *The edge selected*

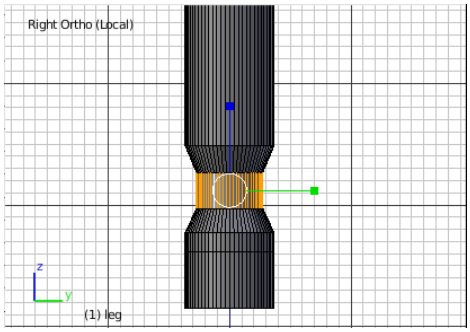

Figure 2-62 *The edges in the ring scaled*

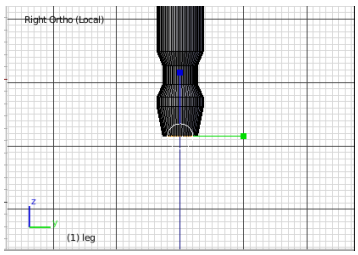

Figure 2-63 *The bottommost edge loop scaled*

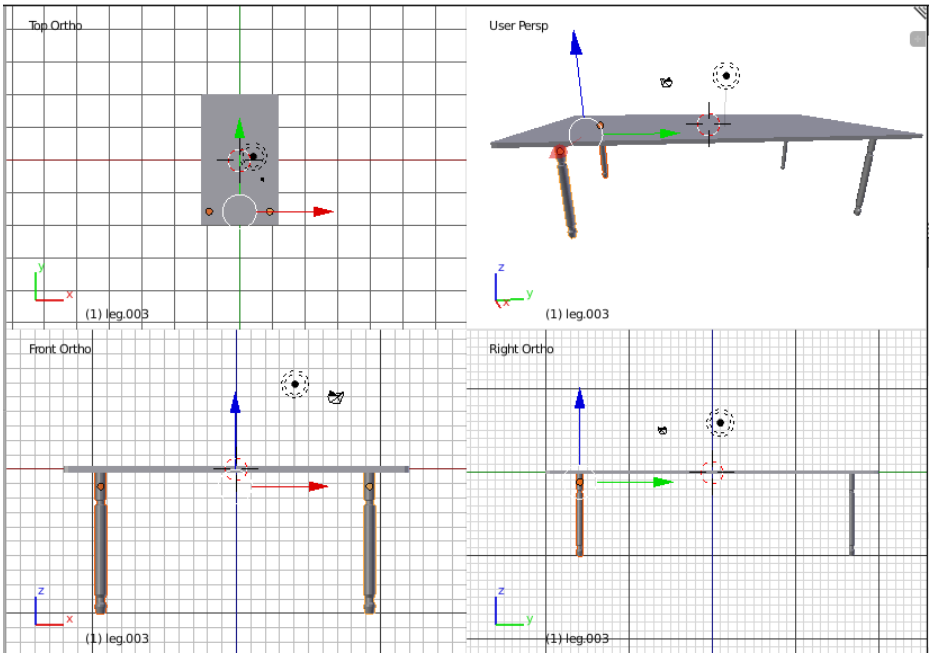

Figure 2-64 *The leg and its copies aligned*

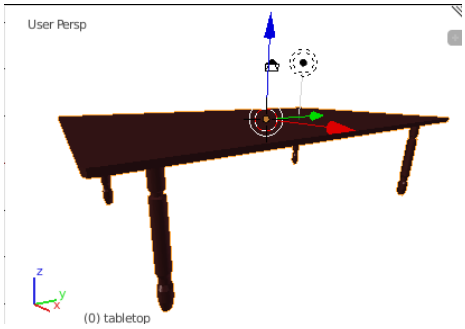

Figure 2-65 *The table displayed*

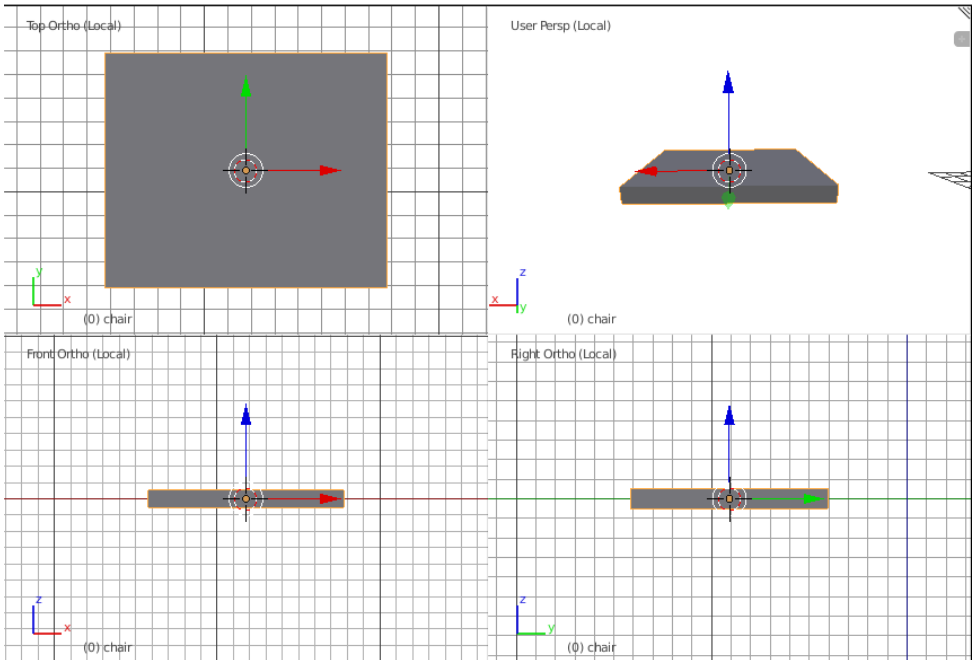

Figure 2-66 *The chair modified*

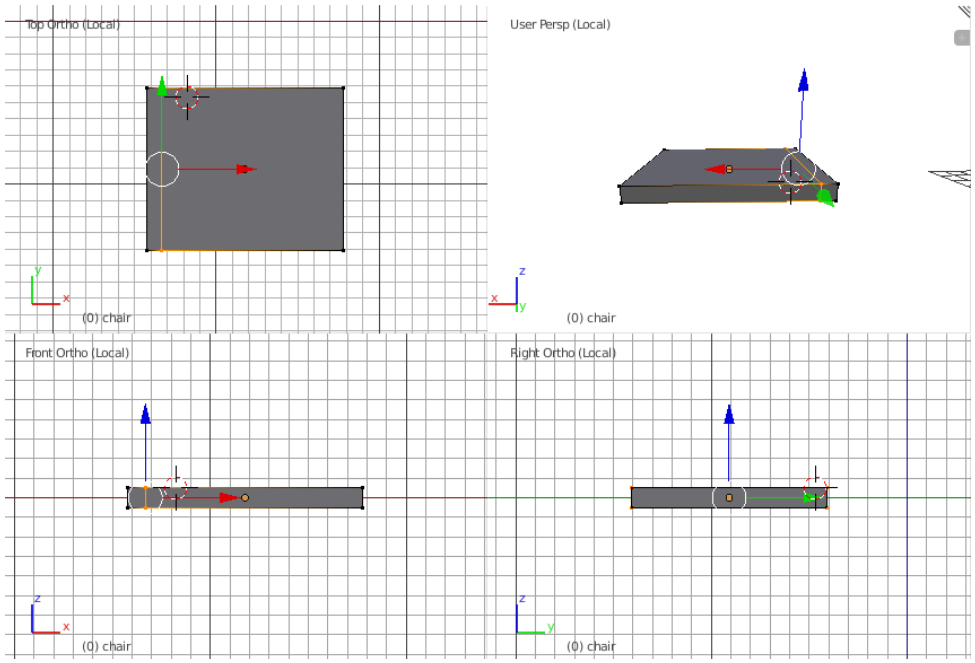

Figure 2-67 *The edge added to chair*

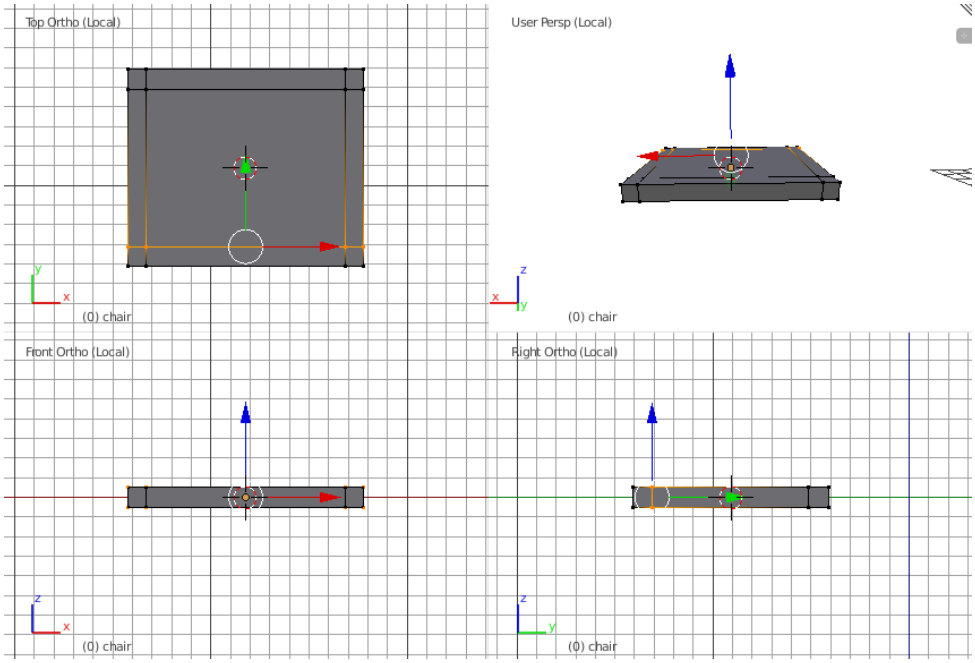

Figure 2-68 *Three more edges added to chair*

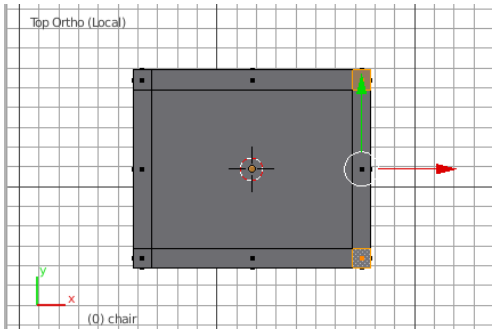

Figure 2-69 *The two faces selected*

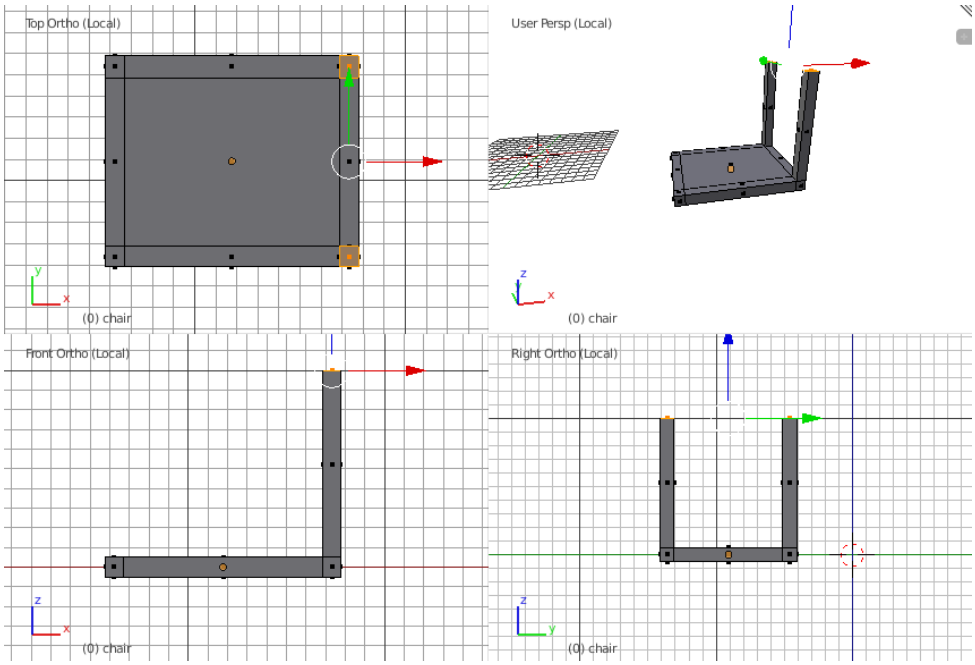

Figure 2-70 *The two faces extruded*

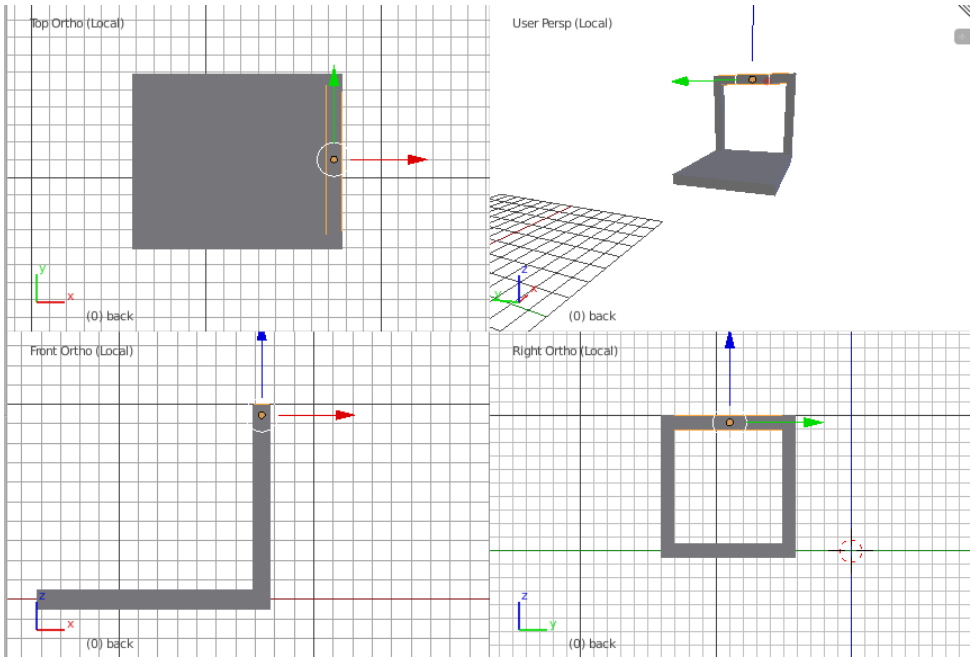

Figure 2-71 *The back aligned*

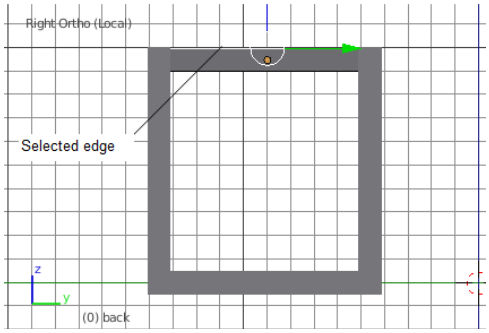

Figure 2-72 *The selected edge*

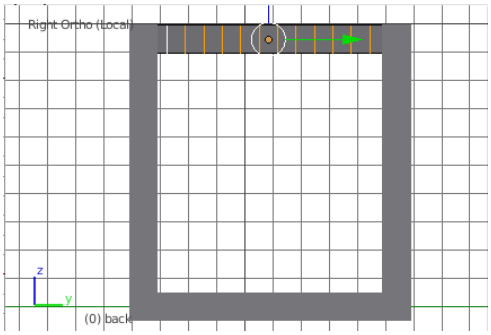

Figure 2-73 *The back subdivided*

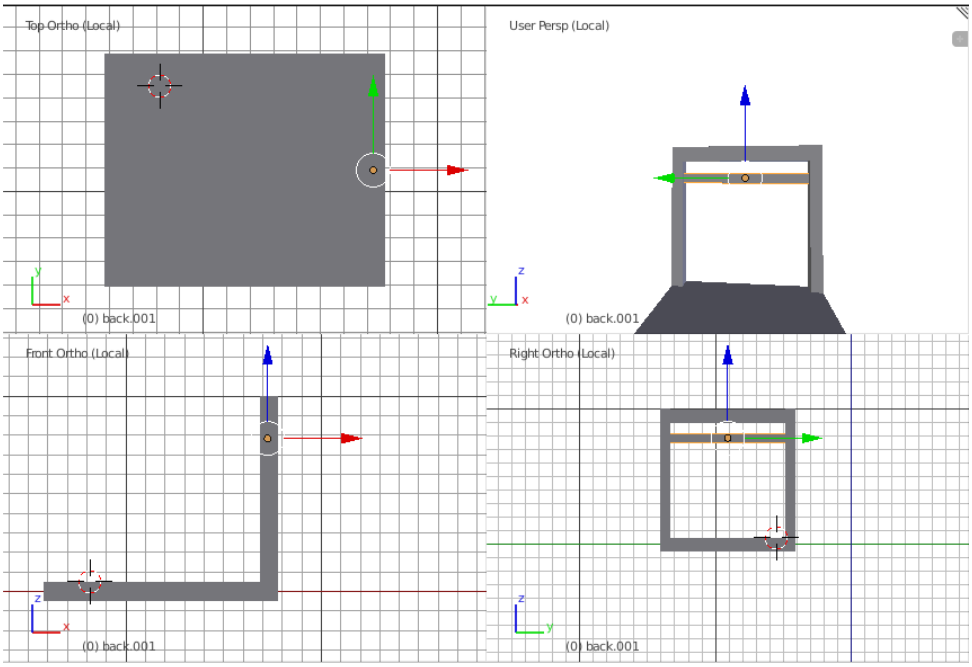

Figure 2-74 *The back001 aligned*

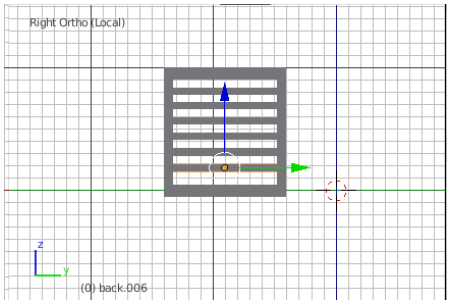

Figure 2-75 *The copies of* back001 aligned

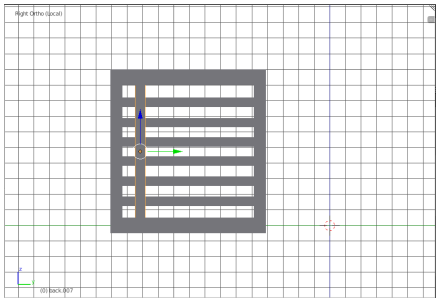

Figure 2-76 *The back007 aligned*

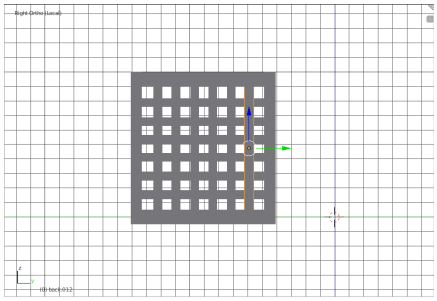

Figure 2-77 *The copies of back007 aligned*

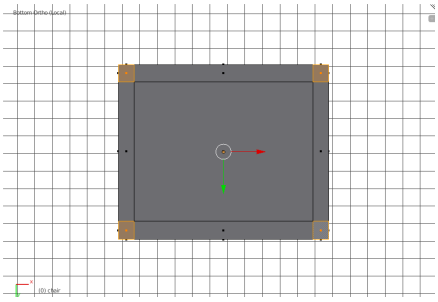

Figure 2-78 *Four faces are selected*

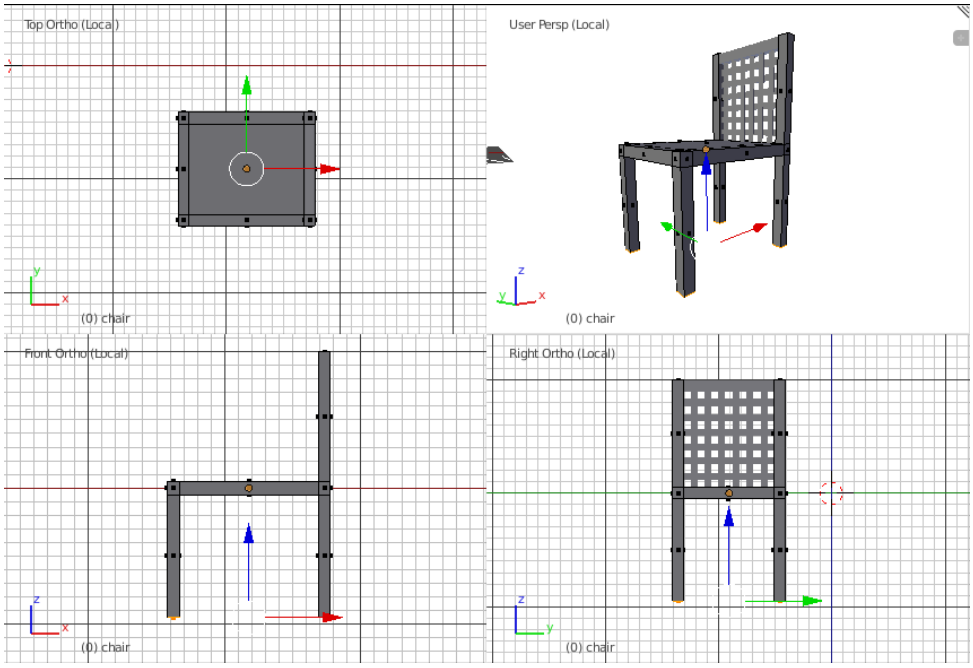

Figure 2-79 *Selected faces extruded*

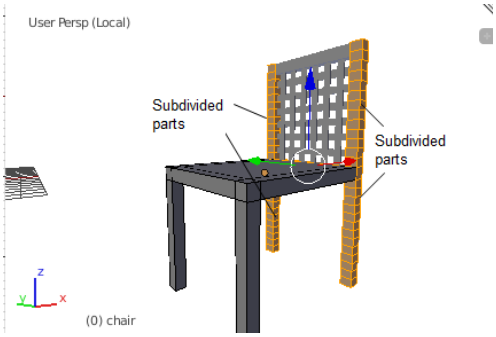

Figure 2-80 *Selected edge rings subdivided*

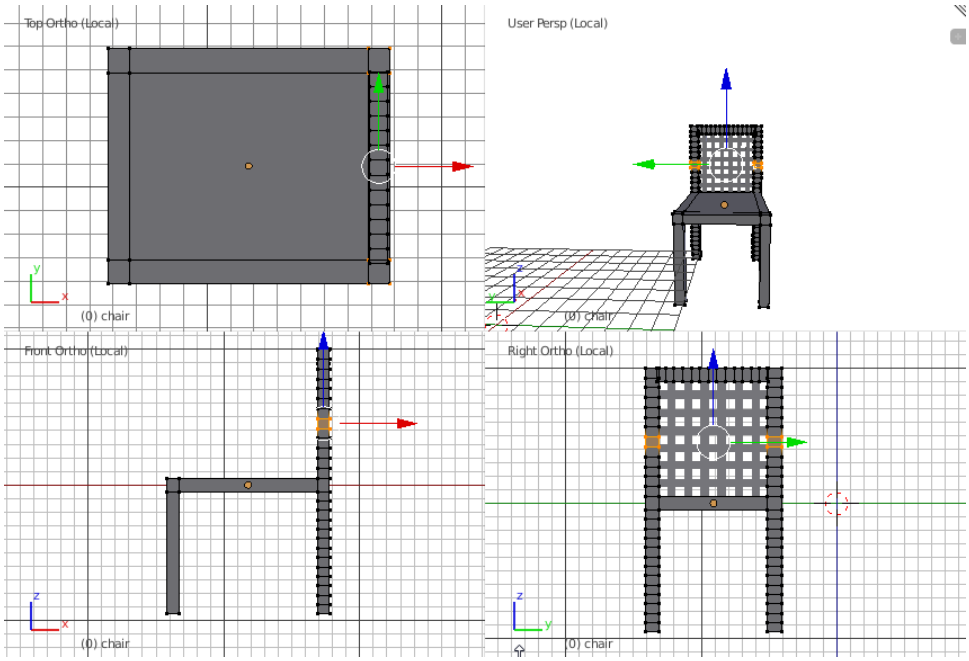

Figure 2-81 *Selected vertices of chair*

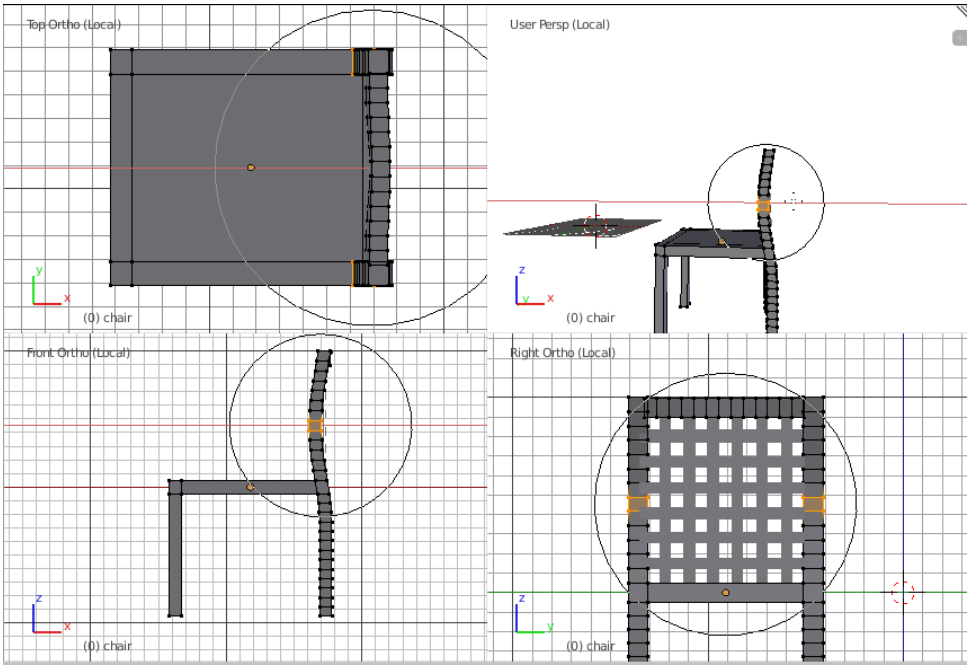

Figure 2-82 *Vertices of chair moved*

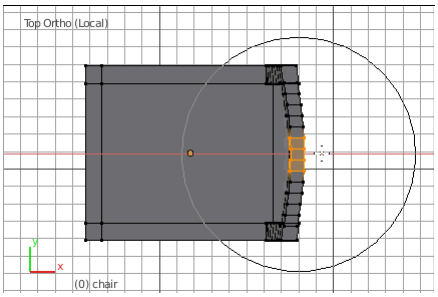

Figure 2-83 *Center vertices of top of chair selected and moved*

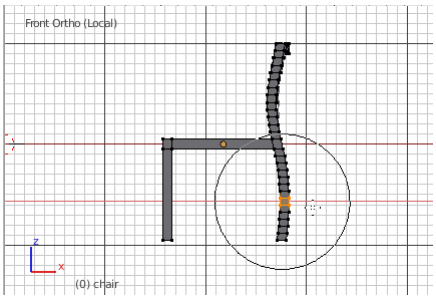

Figure 2-84 *Center vertices of two legs selected and moved*

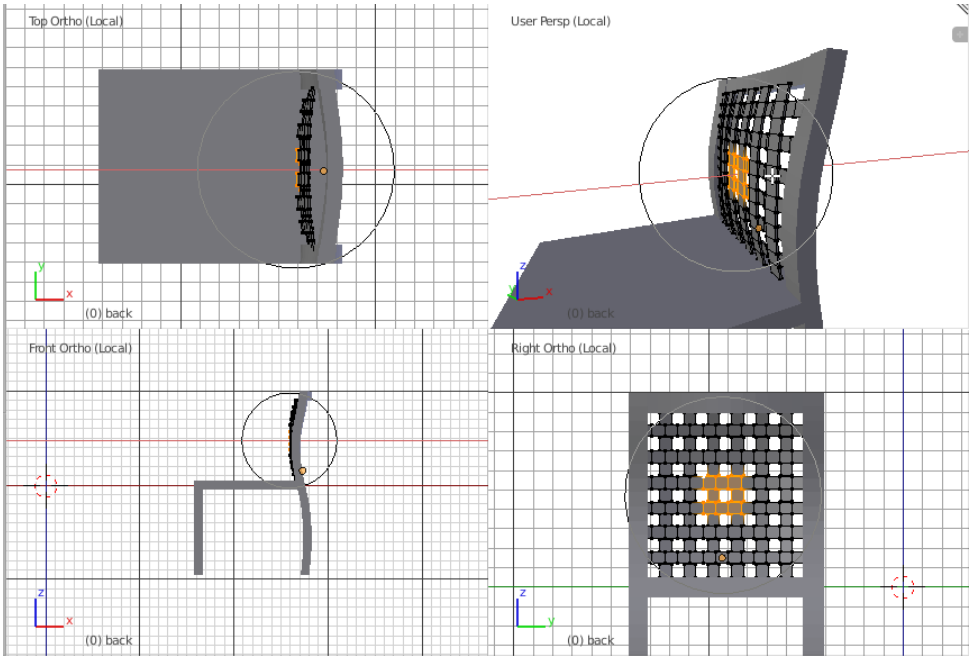

Figure 2-85 *Center vertices of back selected and moved*

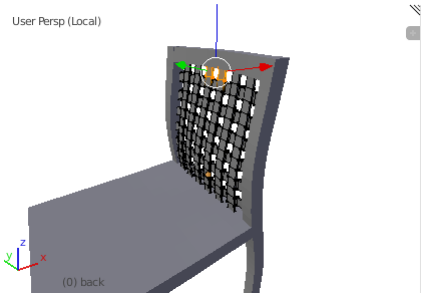

Figure 2-86 *Top vertices of back selected and moved*

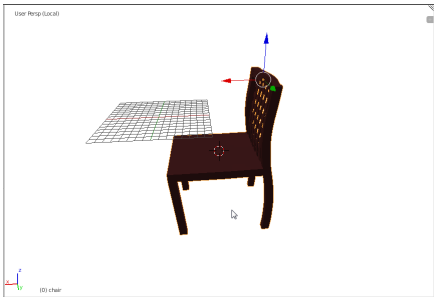

Figure 2-87 *The chair displayed*

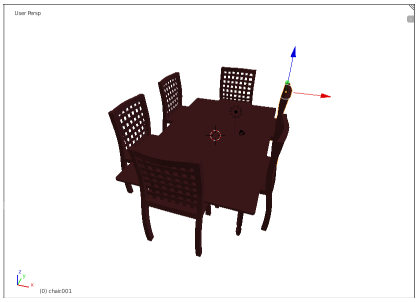

Figure 2-88 *Dining table set*

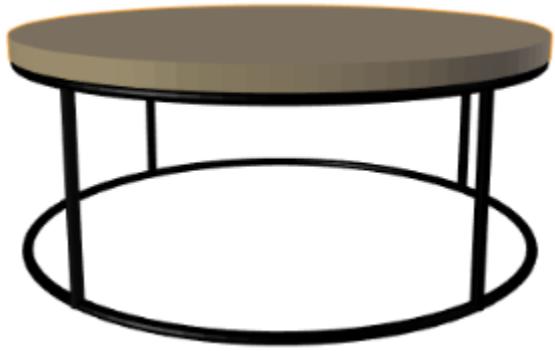

Figure 2-89 *The center table*

Figure 2-90 *The house model*

Chapter 3

Working with Curve Primitives

Learning Objectives

After completing this chapter, you will be able to:

- *Use Bezier curve primitives*
- *Use NURBS curve and NURBS surface primitives*
- *Modify Bezier, NURBS curve, and NURBS surface primitives*
- *Create and modify text*
- *Add background image*

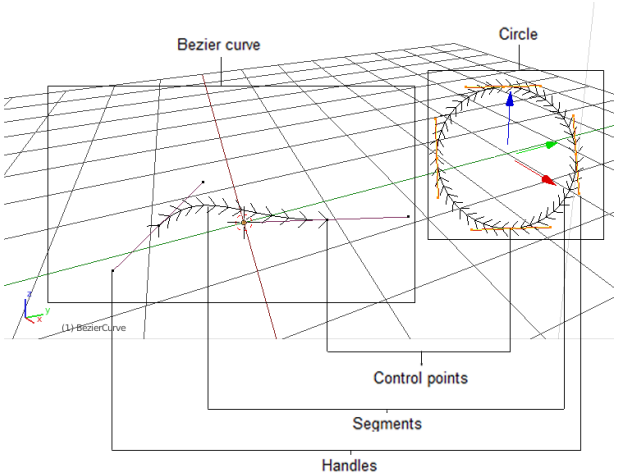

Figure 3-1 *The Bezier and Circle primitives and their elements*

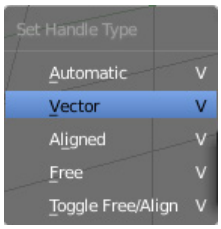

Figure 3-2 *The* ***Handle*** menu *displayed*

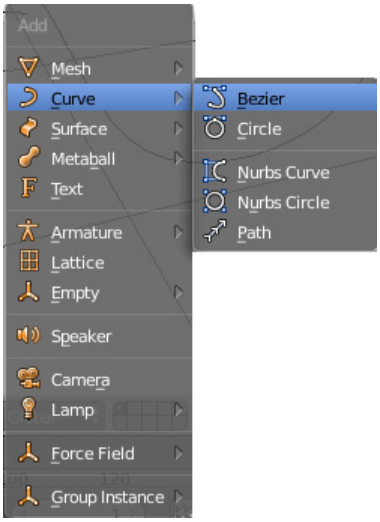

Figure 3-3 *Choosing* ***Bezier*** *from the cascading menu*

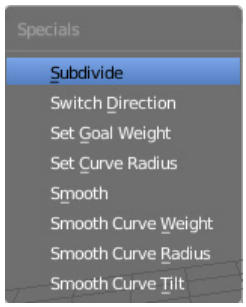

Figure 3-4 *The* ***Specials*** *menu displayed*

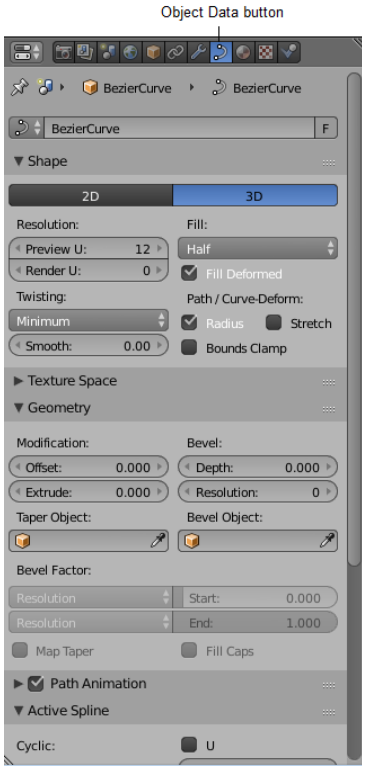

Figure 3-5 *Various panels in the* ***Properties Editor***

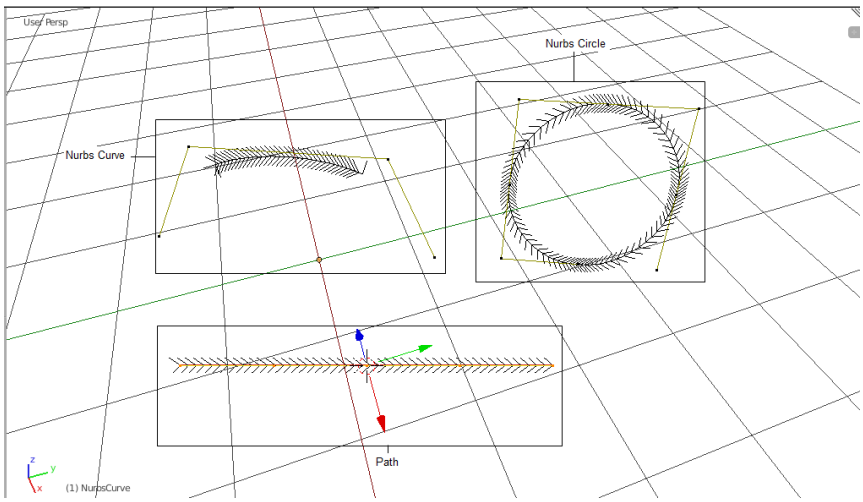

Figure 3-6 *The Nurbs Curve, Nurbs Circle, and Path primitives*

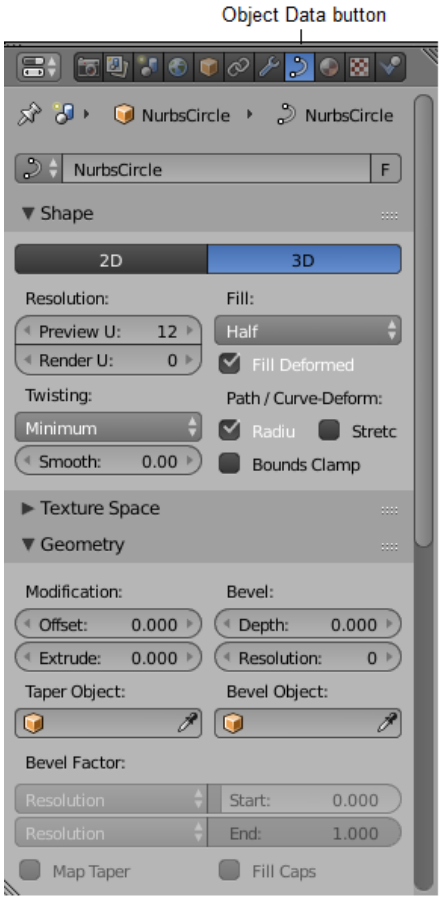

Figure 3-7 *Various panels in* ***Properties Editor***

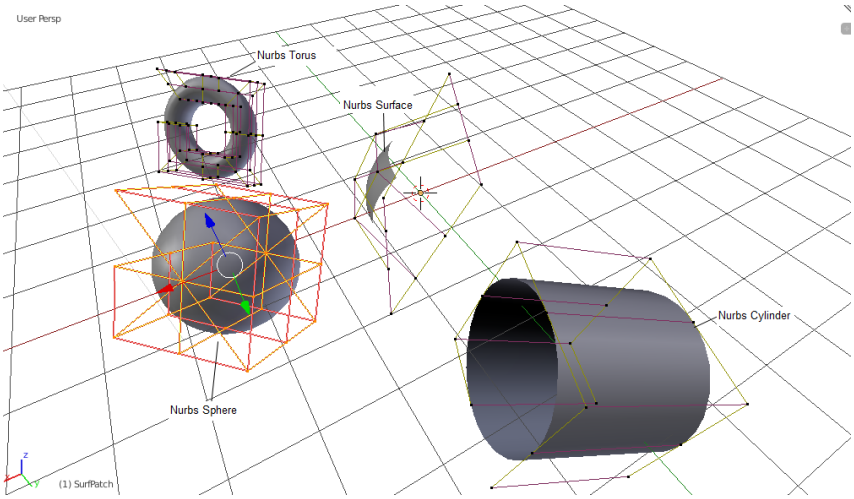

Figure 3-8 *All the Nurbs surfaces displayed*

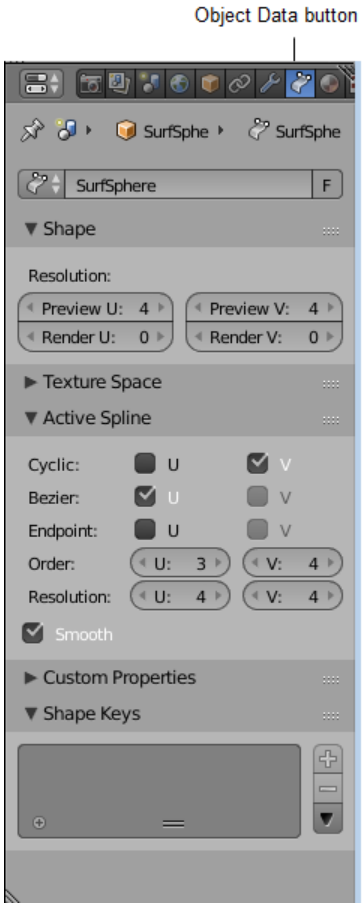

Figure 3-9 *Various panels in* ***Properties Editor***

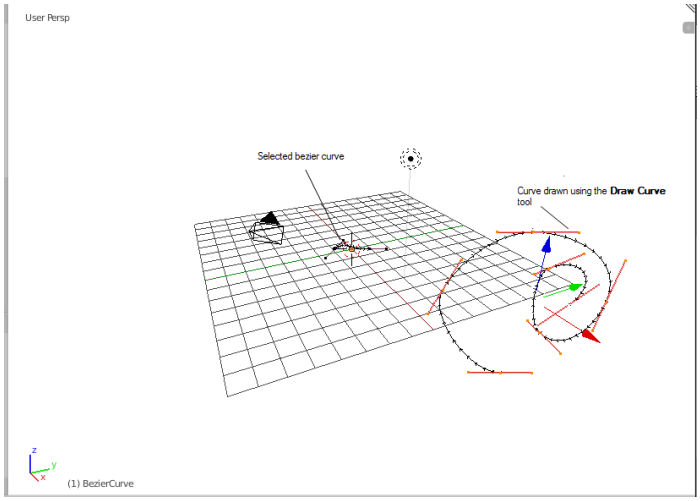

Figure 3-10 *The freehand curve drawn*

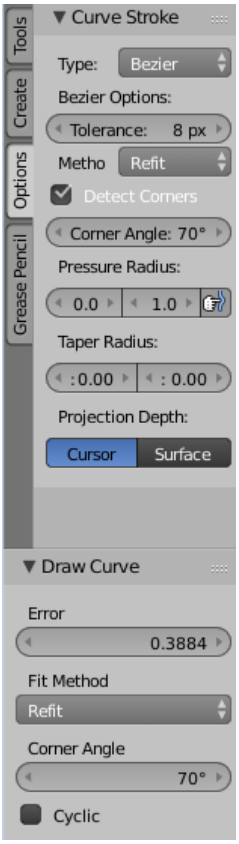

Figure 3-11 *The parameters in* ***Toolshelf***

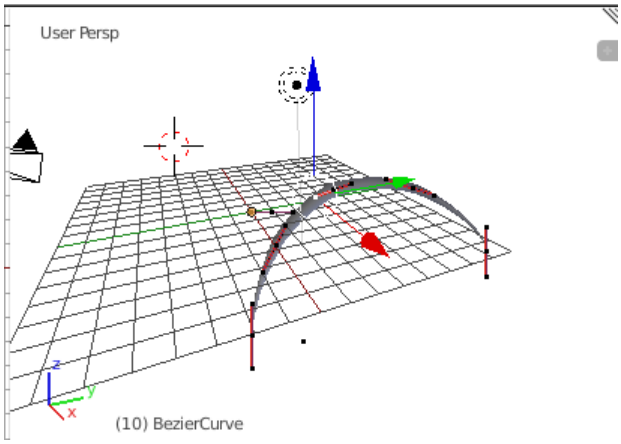

Figure 3-12 *Freehand curve drawn after setting the parameters*

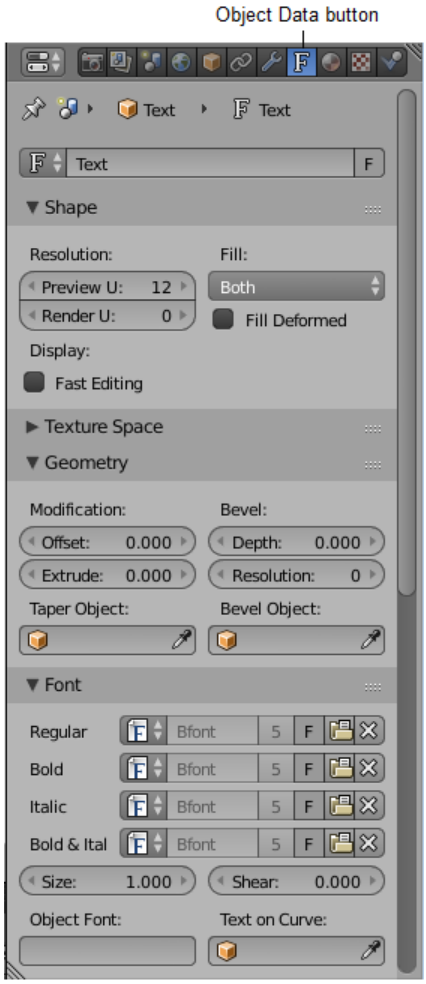

Figure 3-13 *Various panels in* ***Properties Editor***

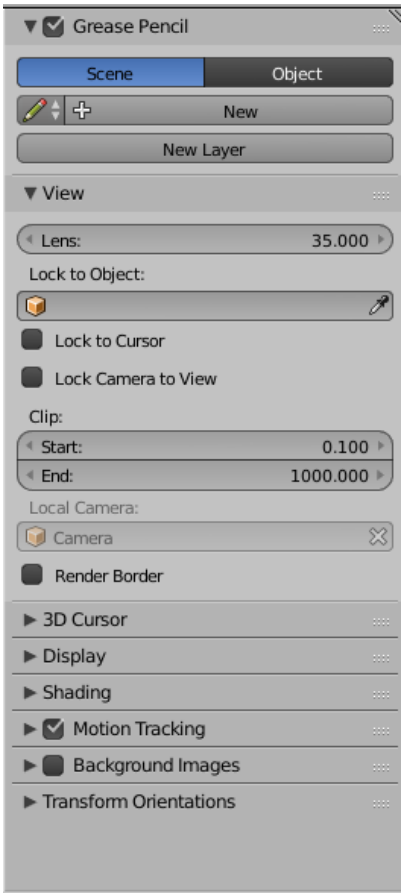

Figure 3-14 The ***Properties Region***

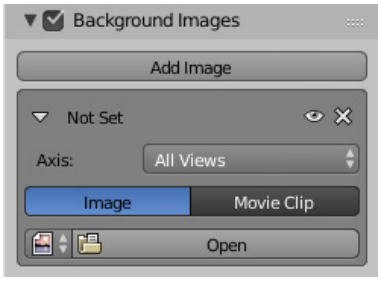

Figure 3-15 The ***Background Images*** *panel on choosing the* ***Add Image*** *button*

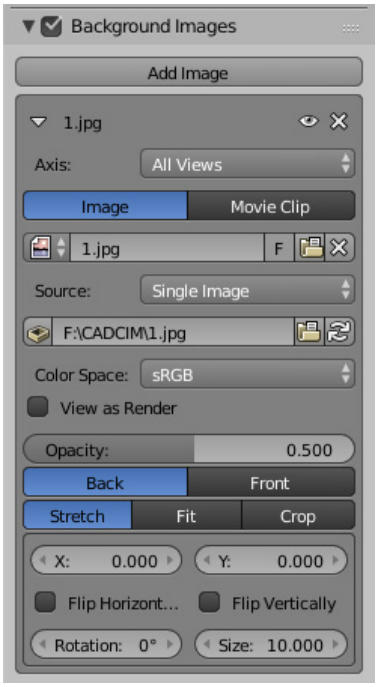

Figure 3-16 The ***Background Images*** *panel on adding the image*

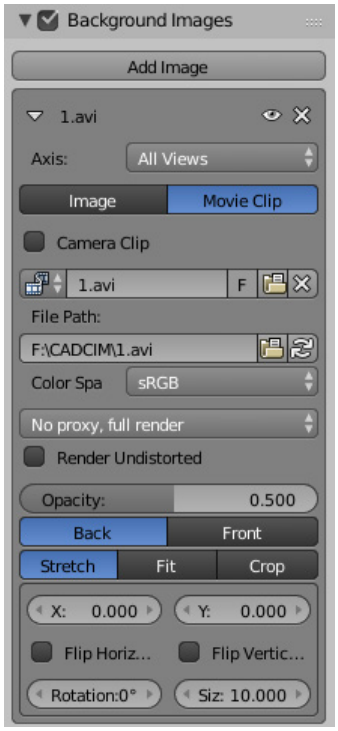

Figure 3-17 The ***Background Images*** *panel on adding the clip*

Figure 3-18 The wallpiece model

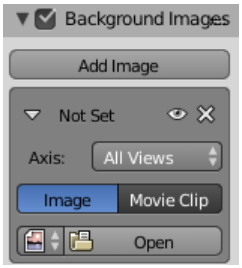

Figure 3-19 *The* ***Not Set*** *area in the* ***Background Images*** *panel*

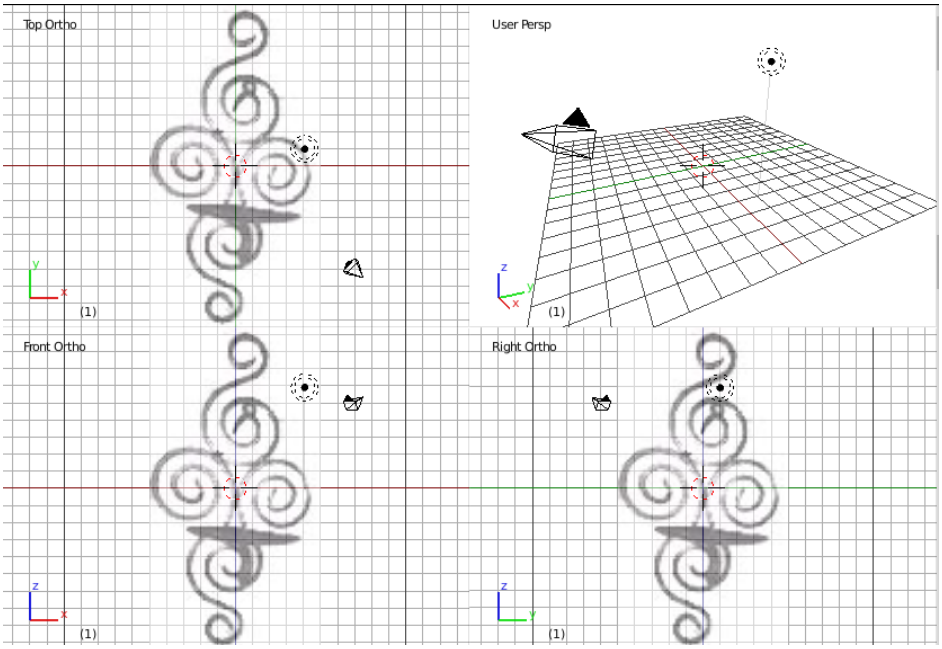

Figure 3-20 *The selected image in ortho views*

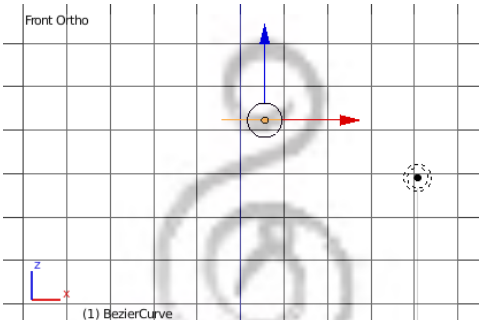

Figure 3-21 *The design moved*

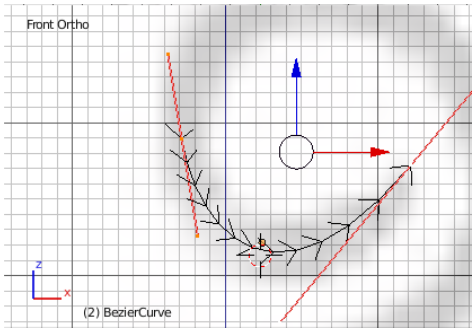

Figure 3-22 *The control points and handles moved*

.

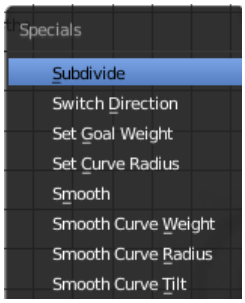

*Figure 3-23 The **Specials** menu*

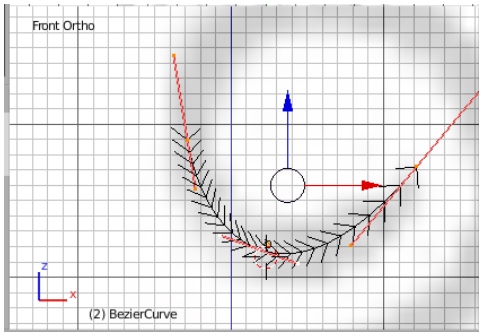

Figure 3-24 A control point added

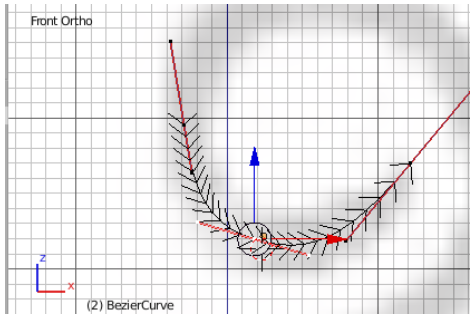

Figure 3-25 The control point and handles moved

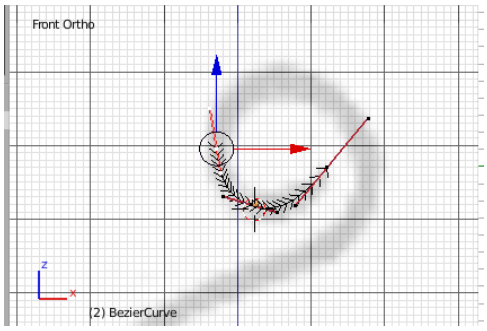

Figure 3-26 The end control point selected

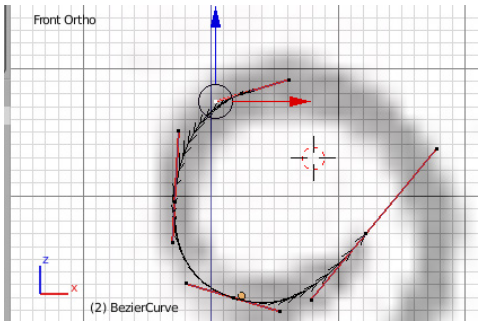

Figure 3-27 The end control point and handles moved

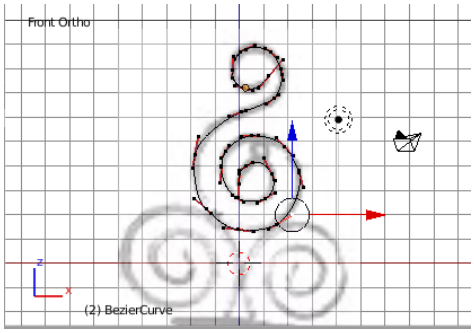

Figure 3-28 The control points added and handles moved

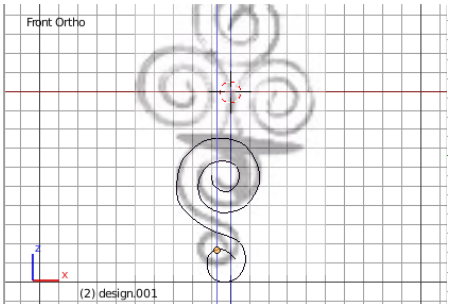

Figure 3-29 *The design.001 rotated and moved down*

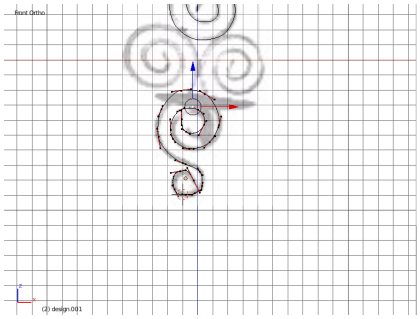

Figure 3-30 *Control points and handles of design.001 moved*

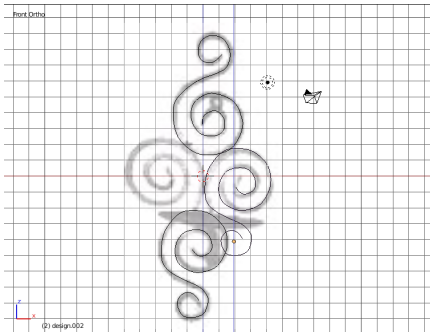

Figure 3-31 *The design.002 moved*

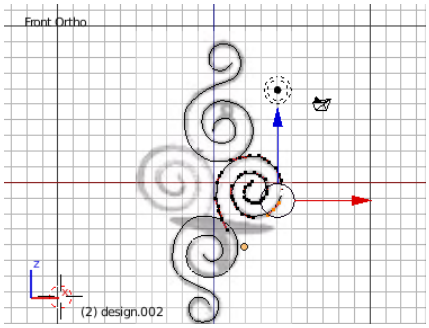

Figure 3-32 *The shape of design.002 changed*

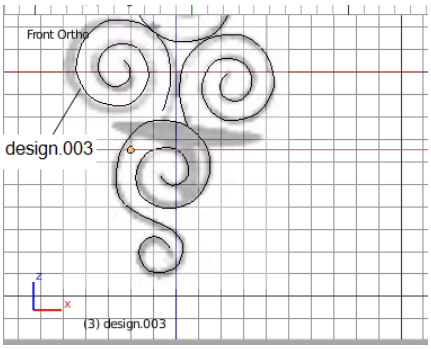

Figure 3-33 *The design003 placed*

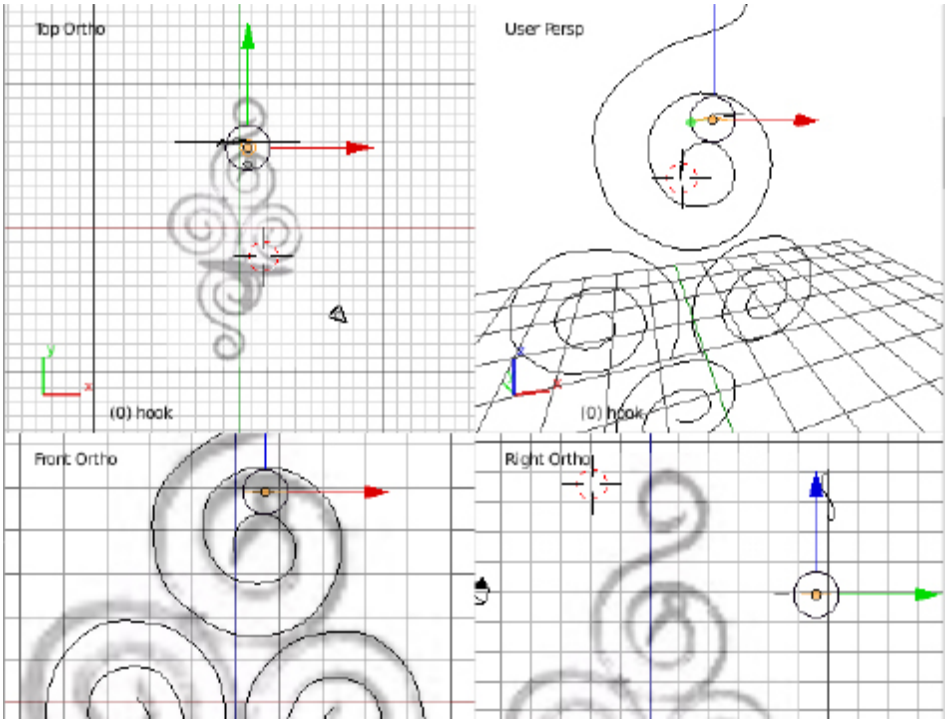

Figure 3-34 *The hook aligned*

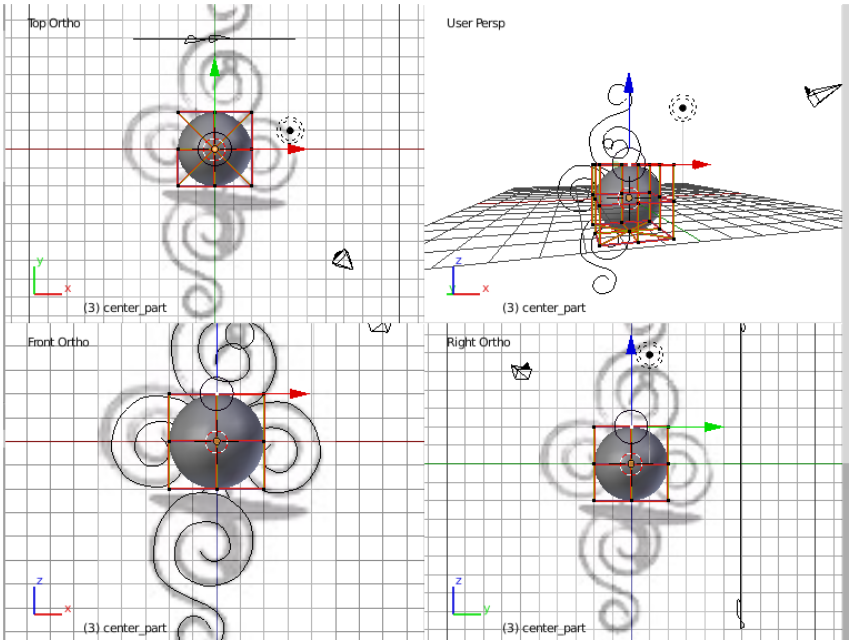

Figure 3-35 *Control points of center_part displayed*

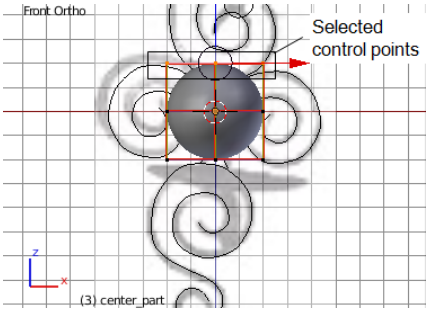

Figure 3-36 *Selected control points of center_part*

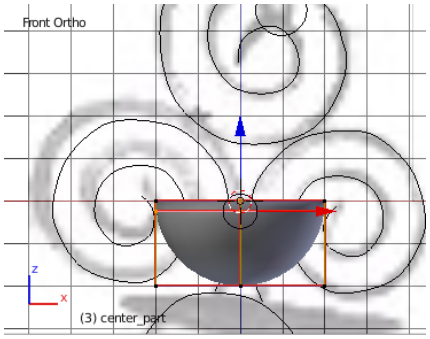

Figure 3-37 *Selected control points of center_part moved down*

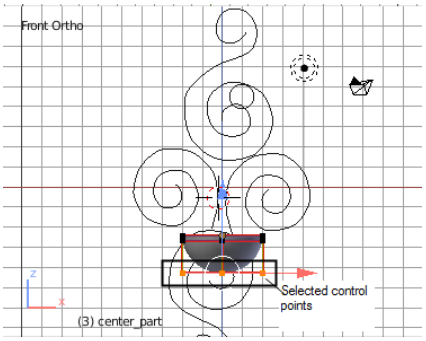

Figure 3-38 *Selected Control points of center_part*

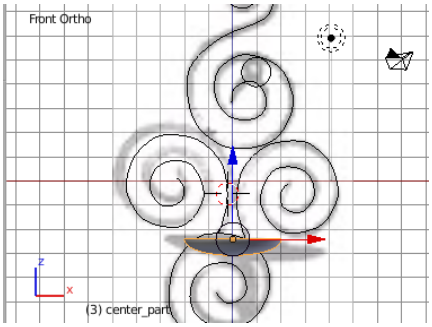

Figure 3-39 *Selected Control points of center_part moved up*

.

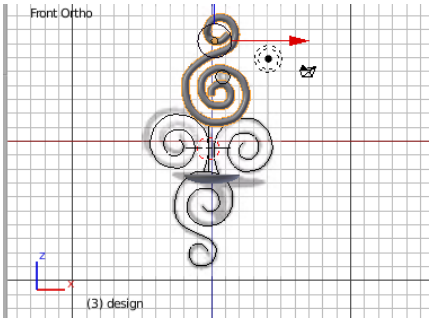

Figure 3-40 *design converted into 3D shape*

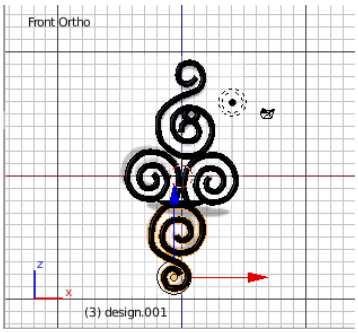

Figure 3-41 *All the 2D curves converted into 3D shape*

Figure 3-42 *The logo*

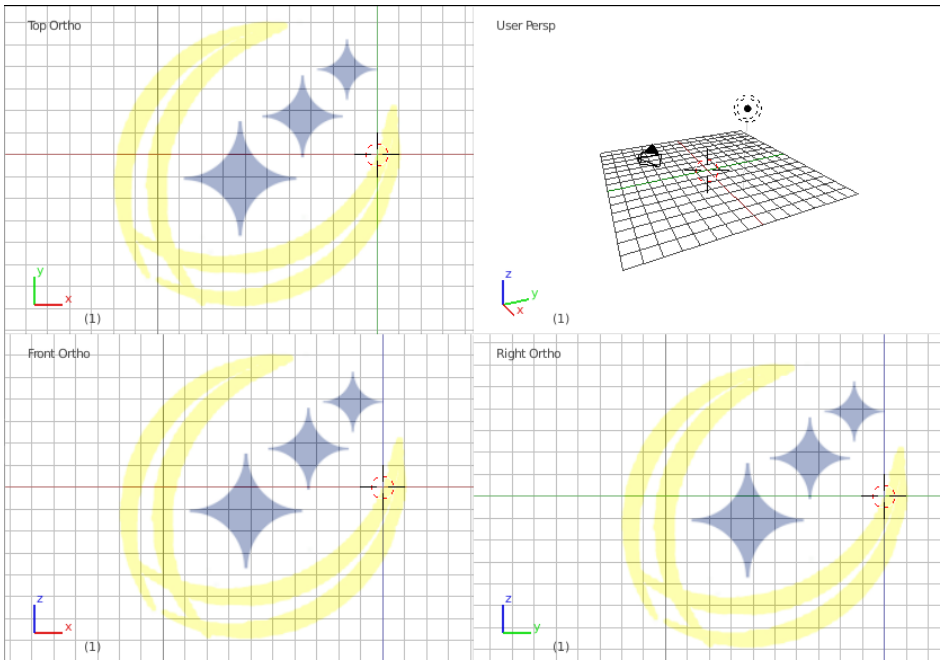

Figure 3-43 *The reference image displayed with reduced opacity*

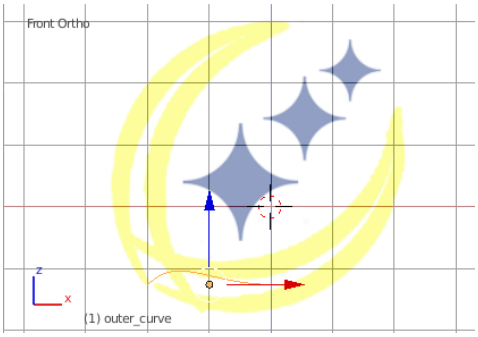

Figure 3-44 *The outer_curve placed*

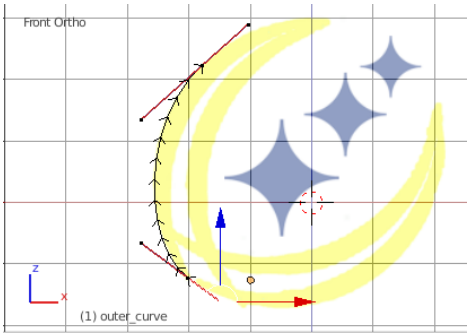

Figure 3-45 *The control points and handles moved*

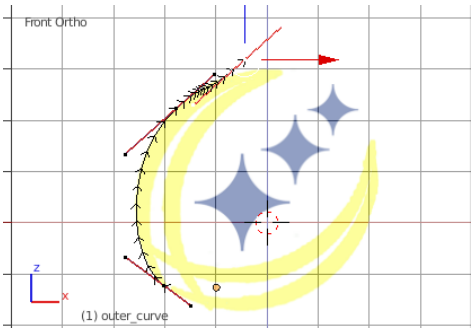

Figure 3-46 *The outer_curve extended*

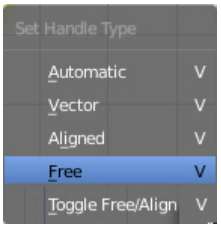

Figure 3-47 *The* ***Set Handle Type*** *menu*

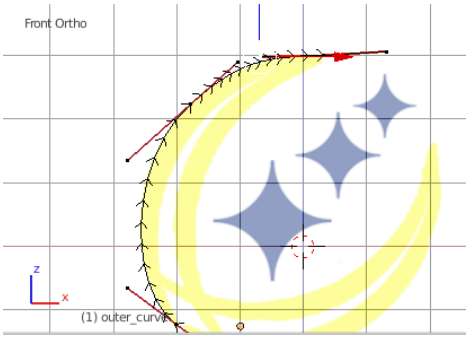

Figure 3-48 *The control point and its handle moved*

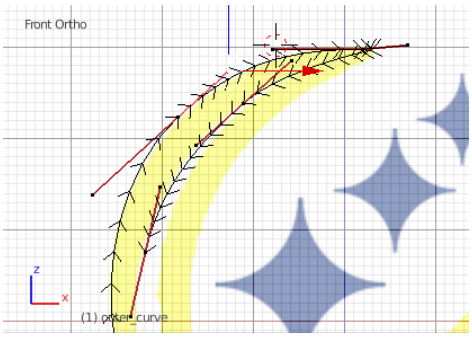

Figure 3-49 *The two end control points and their handles moved*

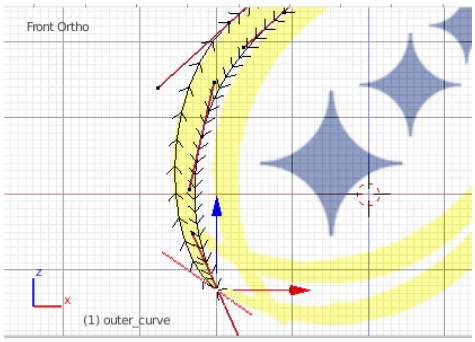

Figure 3-50 *The last control point placed near to the first control point*

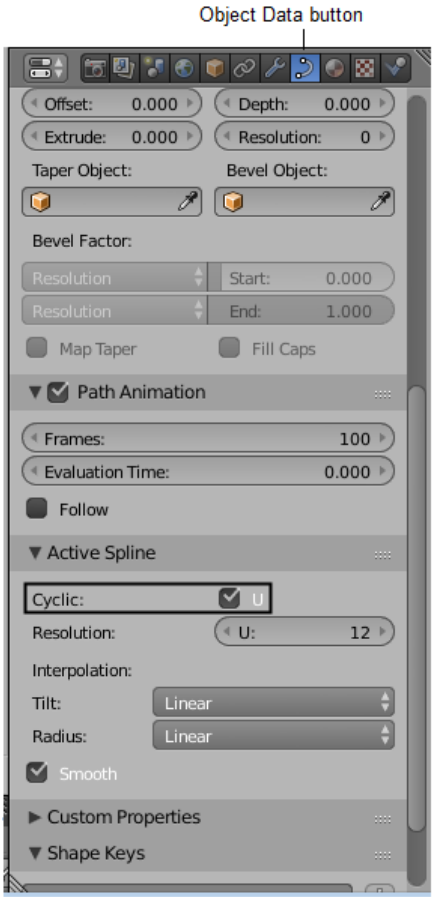

Figure 3-51 *The* ***Cyclic*** *check box selected in the* ***Active Spline*** *panel*

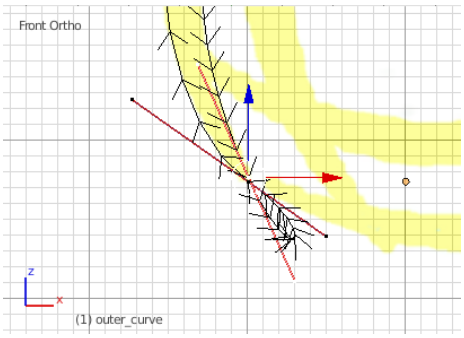

Figure 3-52 *The last control point and first control point joined*

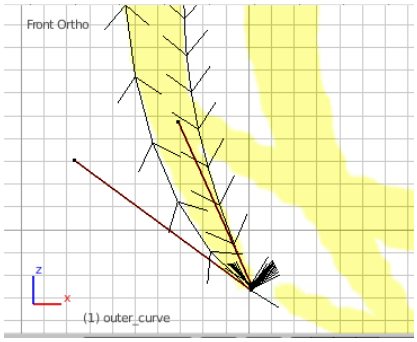

Figure 3-53 *The last and the first control points and handles placed*

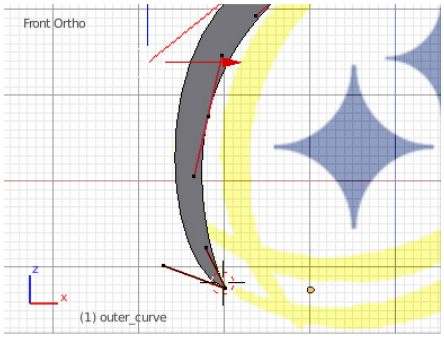

Figure 3-54 *The outer_curve filled with grey color*

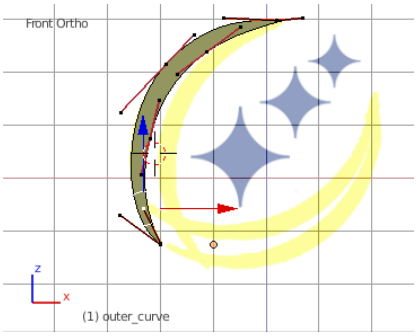

Figure 3-55 *The color of outer_curve changed*

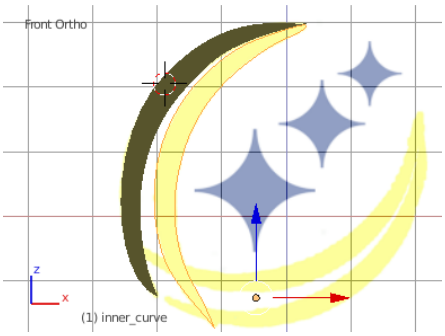

Figure 3-56 *The inner_curve created*

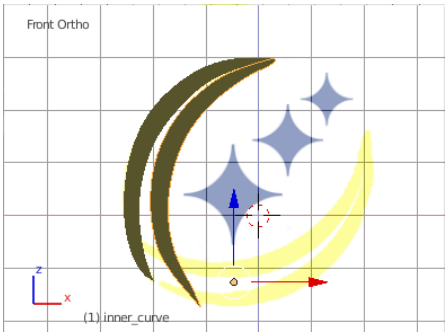

Figure 3-57 *The inner_curve filled with color*

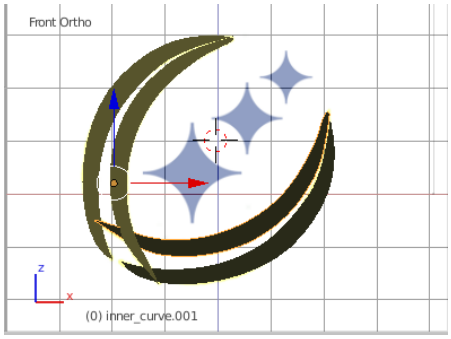

Figure 3-58 *The inner_curve.001 and outer_curve.001 placed*

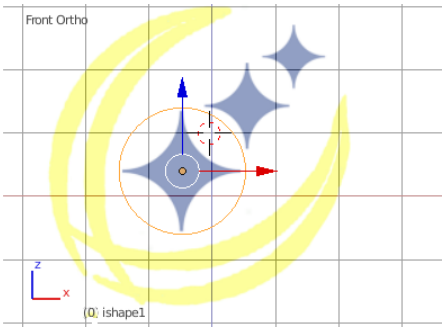

Figure 3-59 *The ishape1 positioned*

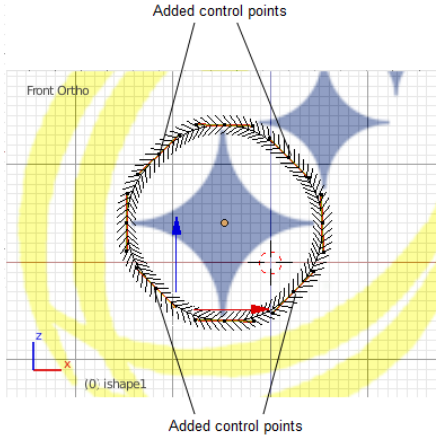

Figure 3-60 *The four control points added to ishape1*

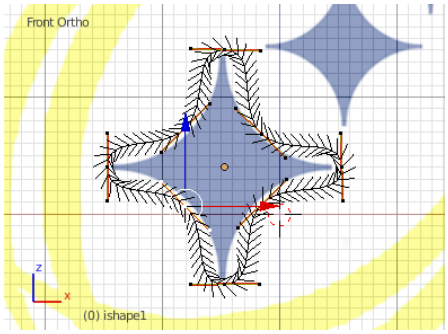

Figure 3-61 *The added control points moved*

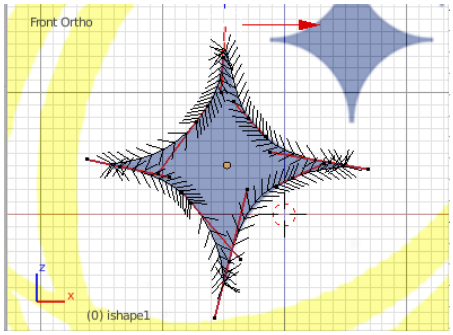

Figure 3-62 *The changed shape of ishape1*

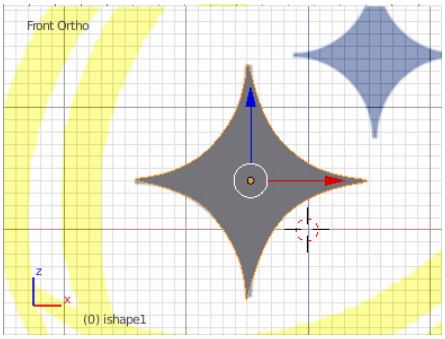

Figure 3-63 *The ishape1 filled with grey color*

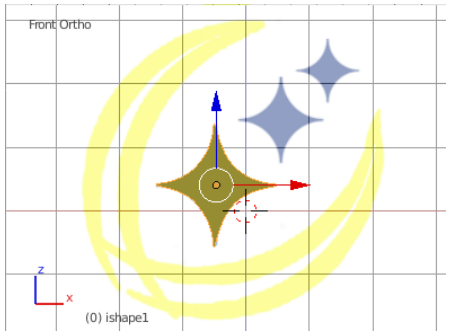

Figure 3-64 *The changed color of ishape1*

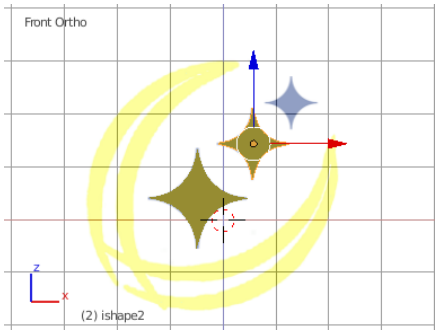

Figure 3-65 *The ishape2 placed on the reference image*

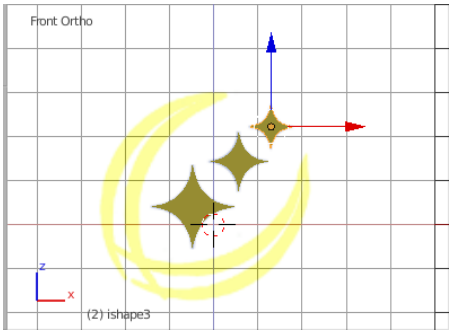

Figure 3-66 *The ishape3 placed on the reference image*

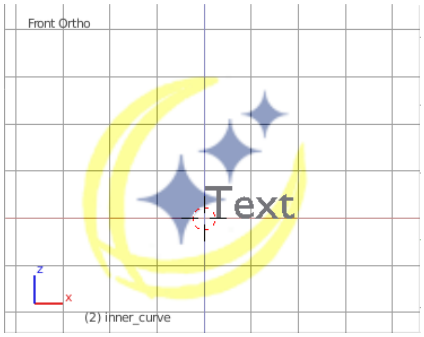

Figure 3-67 *The text created*

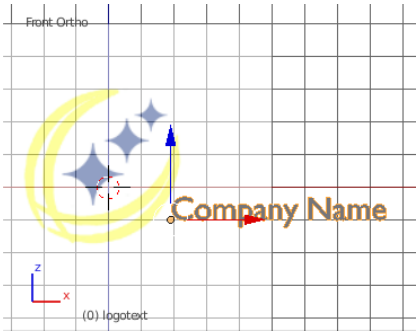

Figure 3-68 *The logotext moved to right of the reference image*

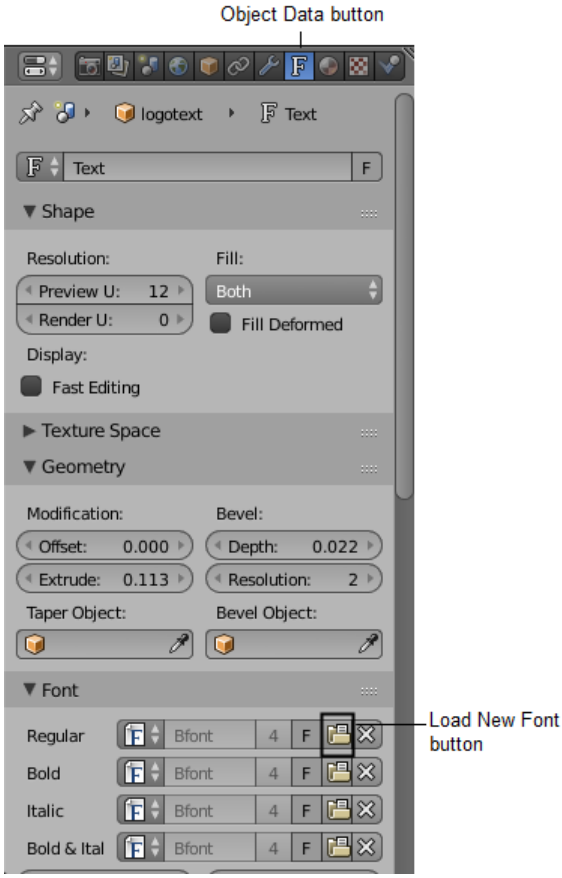

Figure 3-69 *Various panels in* ***Properties Editor***

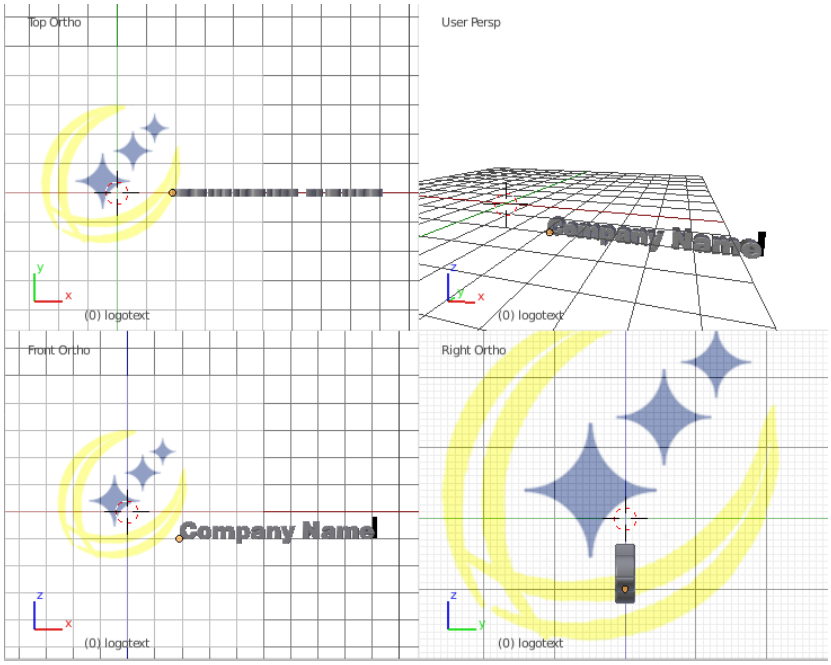

Figure 3-70 *The logotext with font and style changed*

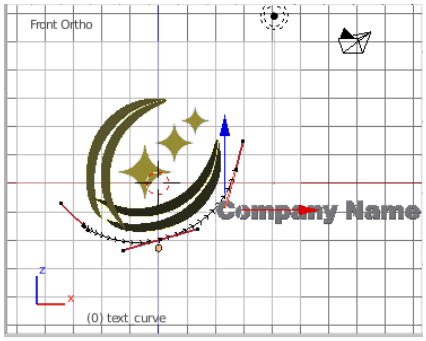

Figure 3-71 *The text_curve modifed*

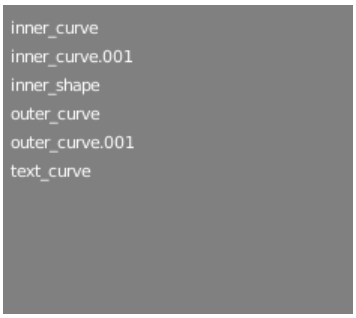

Figure 3-72 *The menu displayed*

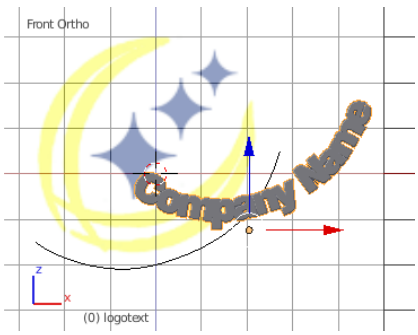

Figure 3-73 *The shape of logotext changed*

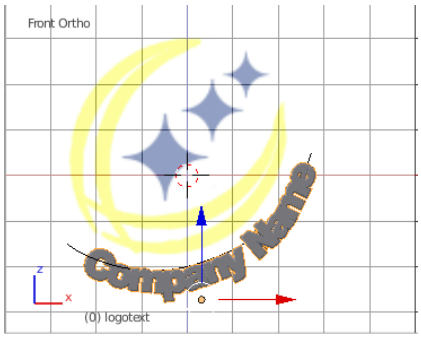

Figure 3-74 *The logotext aligned*

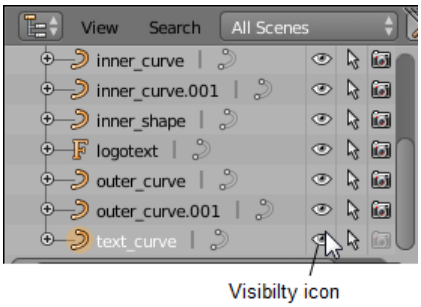

Figure 3-75 *Choosing the visibility icon from the* ***Outliner***

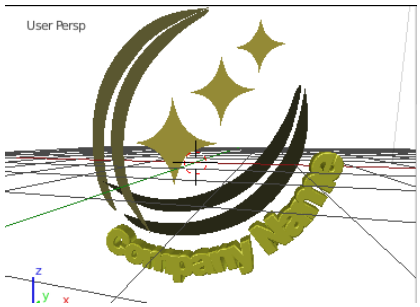

Figure 3-76 *All the shapes of logo*

Figure 3-77 *The rhino line art*

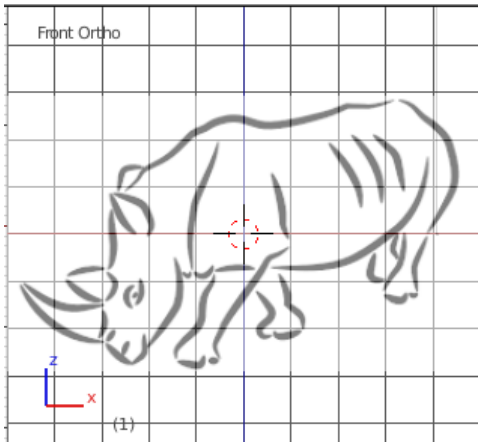

Figure 3-78 *The reference image displayed*

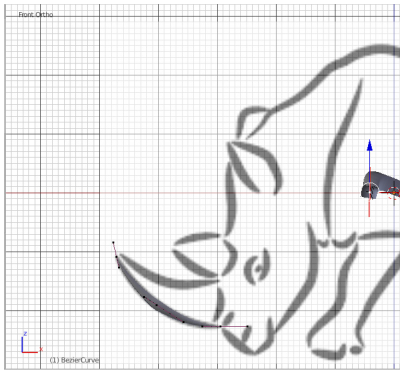

Figure 3-79 *The curve drawn*

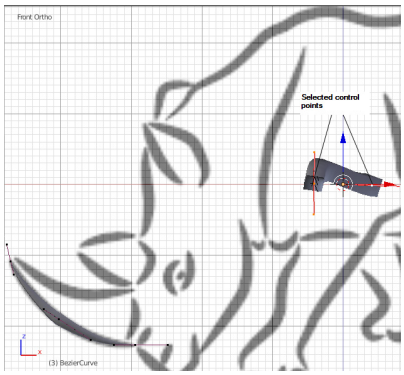

Figure 3-80 *The selected control points*

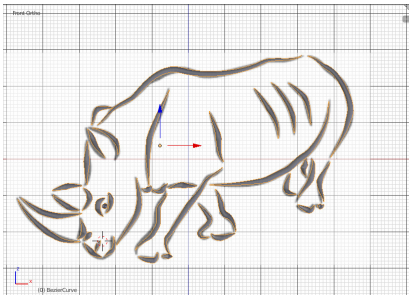

Figure 3-81 *The lineart created*

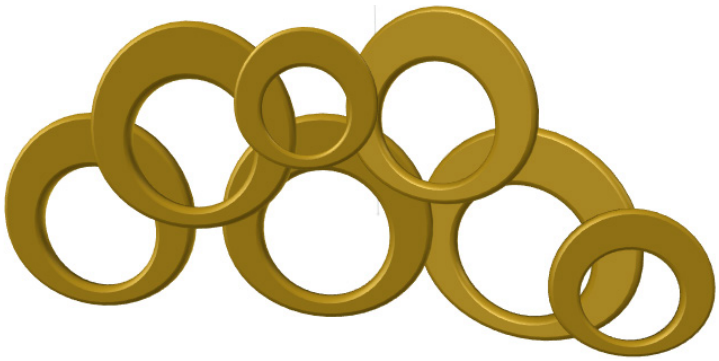

Figure 3-82 *The wall design model*

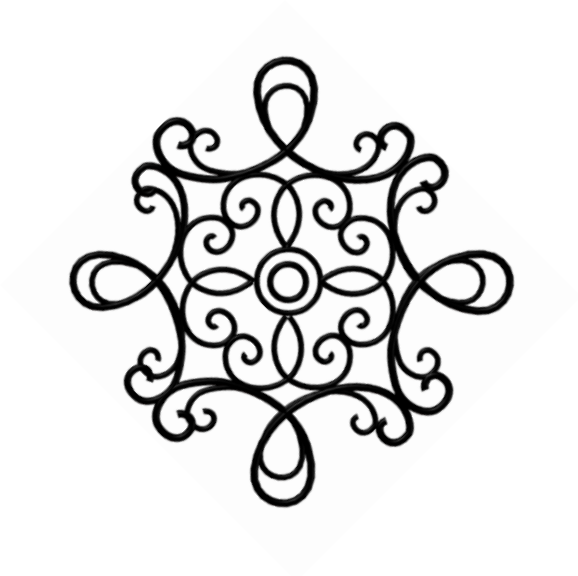

Figure 3-83 *The wall design model*

Chapter 4

Working with Modifiers

Learning Objectives

After completing this chapter, you will be able to:

- *Use modifiers*
- *Understand the types of modifiers*
- *Create complex objects using modifiers*
- *Understand the pivot point alignment*

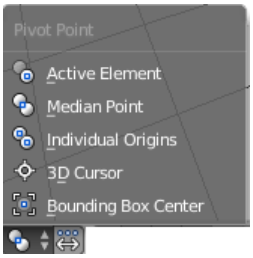

Figure 4-1 *The* ***Pivot*** *drop-down*

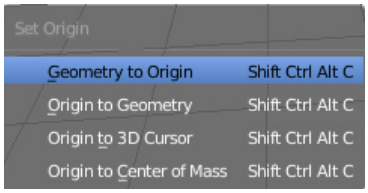

Figure 4-2 *The* ***Set Origin*** *menu*

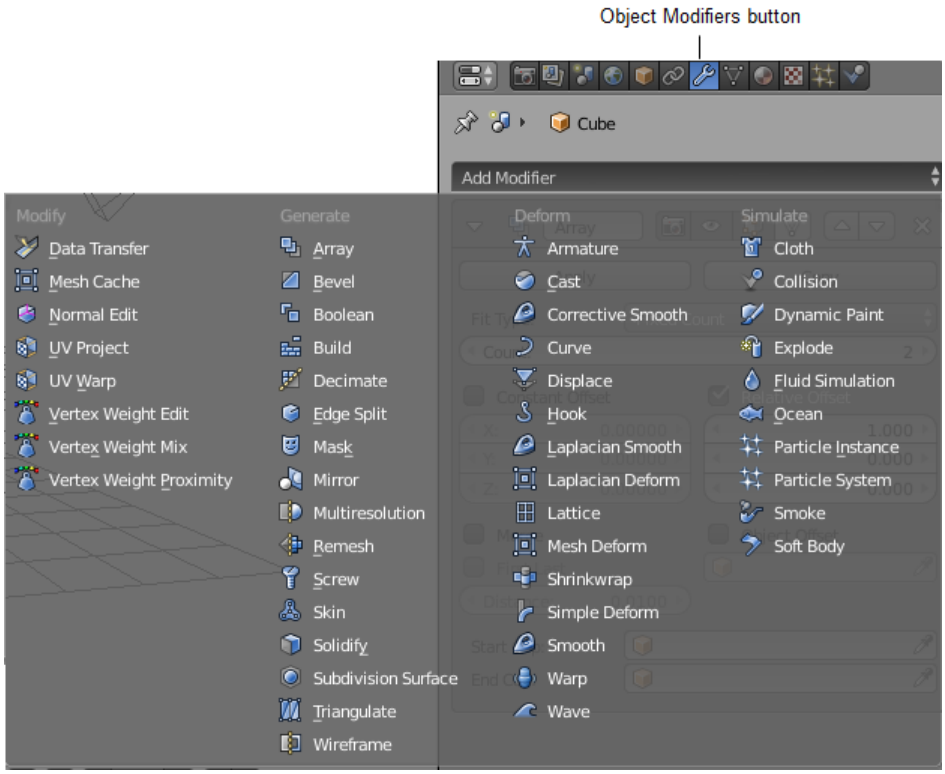

Figure 4-3 *Modifiers displayed for a mesh primitive*

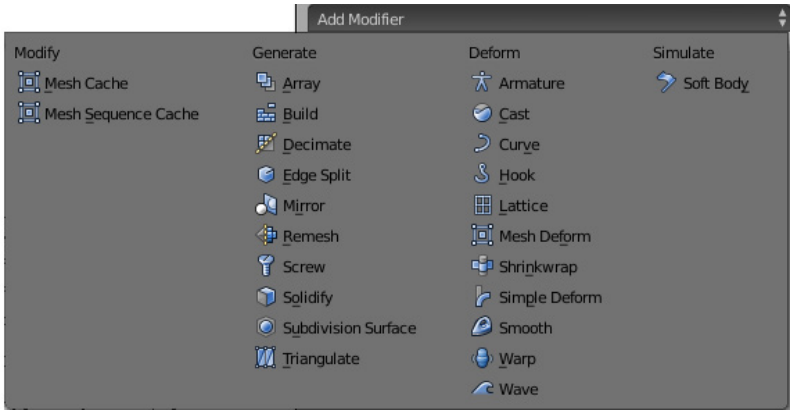

Figure 4-4 *Modifiers displayed for a curve primitive*

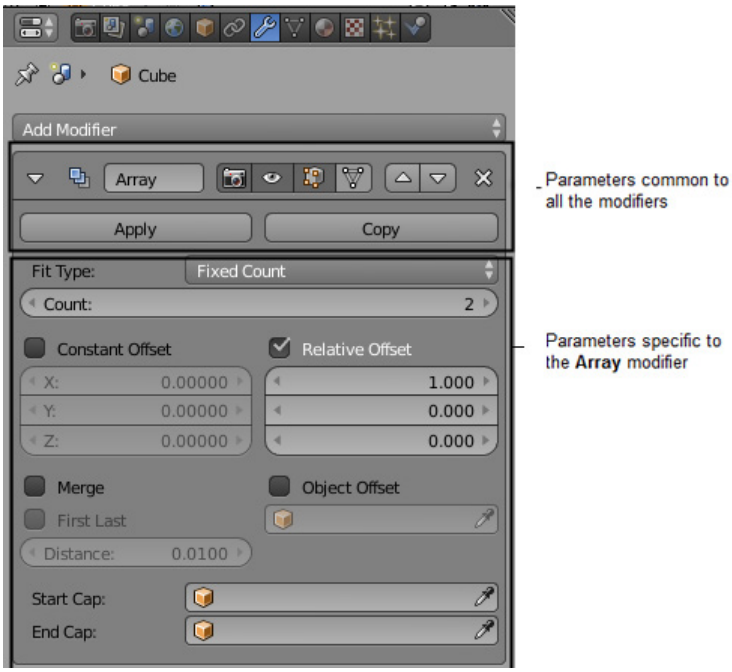

Figure 4-5 *The parameters for the* ***Array*** *modifier*

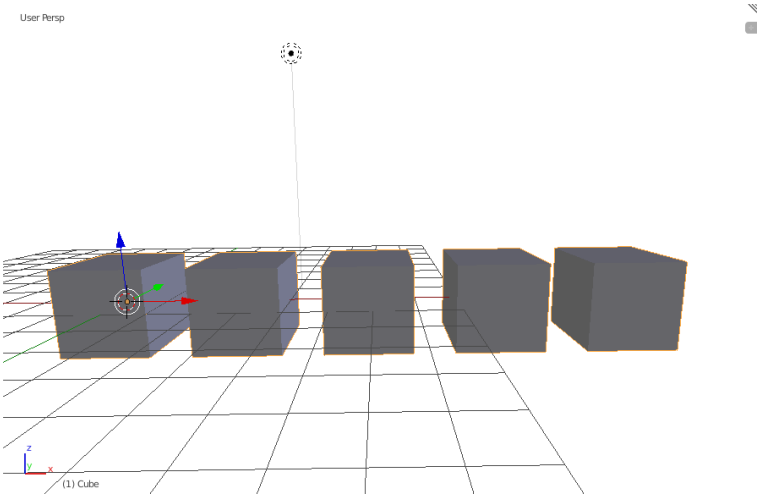

Figure 4-6 *The* ***Array*** *modifier added to a cube*

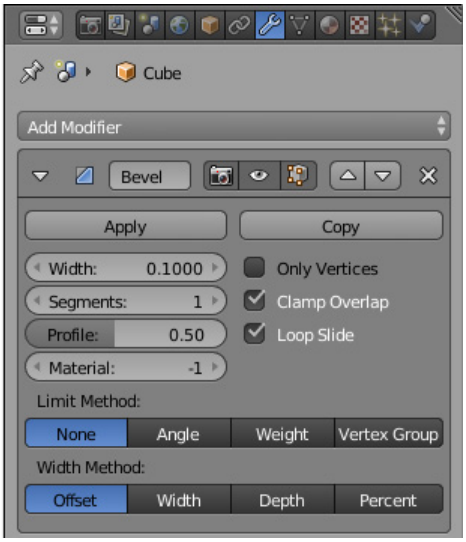

Figure 4-7 *The parameters for the* ***Bevel*** *modifier*

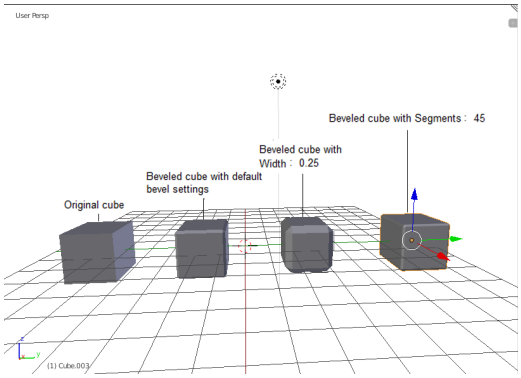

Figure 4-8 *The* ***Bevel*** *modifier added to a cube*

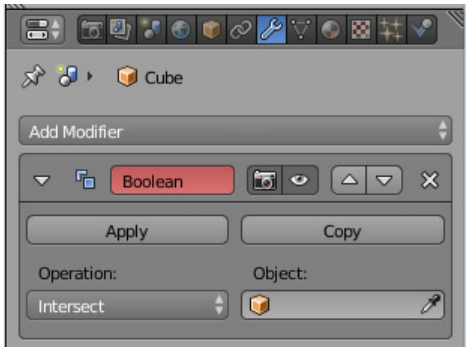

Figure 4-9 *The parameters for the* ***Boolean*** *modifier*

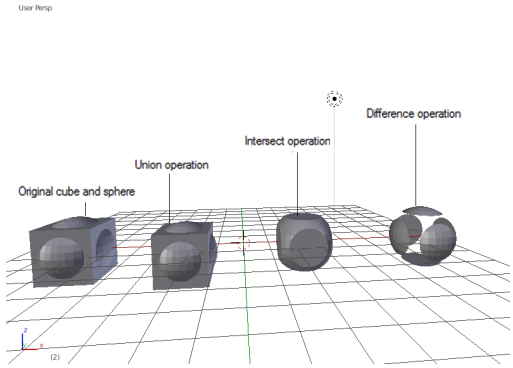

Figure 4-10 *The Boolean operation performed using various options*

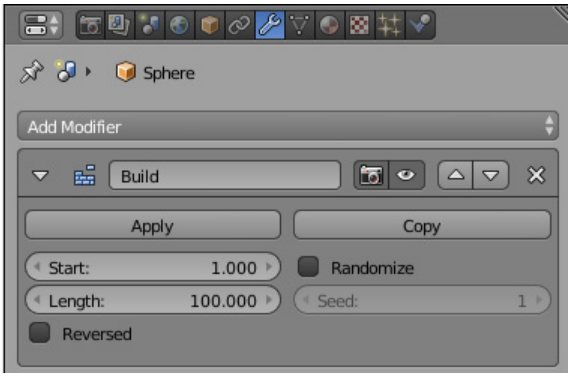

Figure 4-11 *The parameters for the* ***Build*** *modifier*

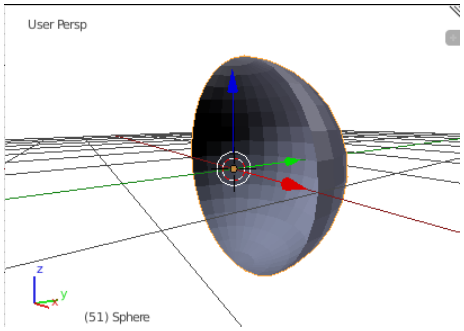

Figure 4-12 *The* ***Build*** *modifier added to a cube*

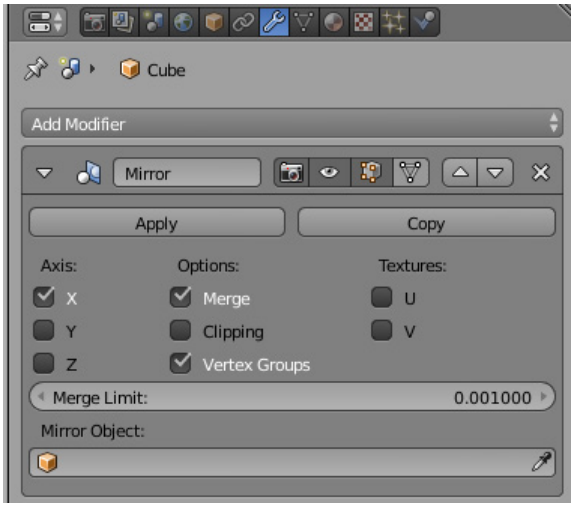

Figure 4-13 *The parameters for the* ***Mirror*** *modifier*

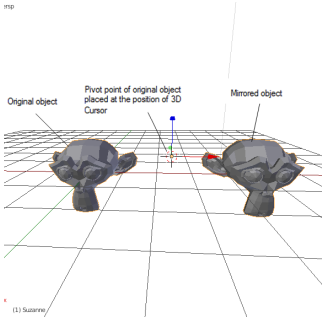

Figure 4-14 *The* ***Mirror*** *modifier added to an object using its own pivot point and axis*

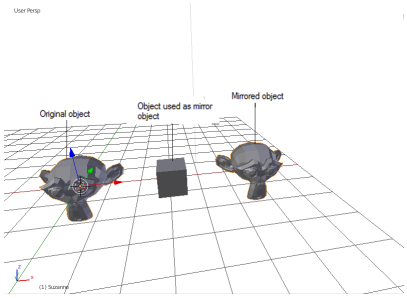

Figure 4-15 *The* ***Mirror*** *modifier added to an object using the mirror object*

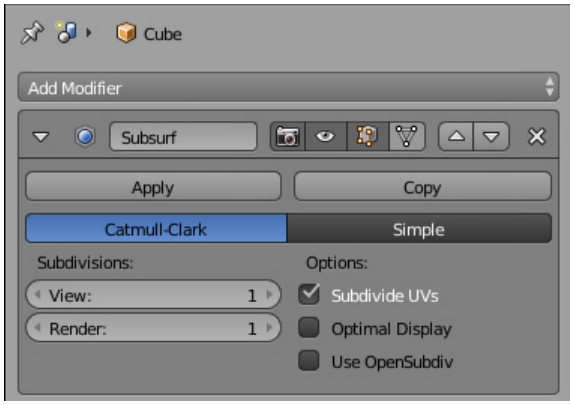

Figure 4-16 *The parameters for the* ***Subdivision Surface*** *modifier*

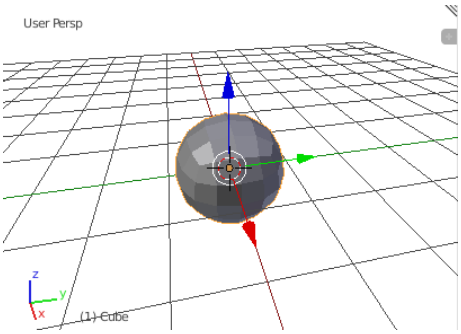

Figure 4-17 *The* ***Subdivision Surface*** *modifier added to a cube*

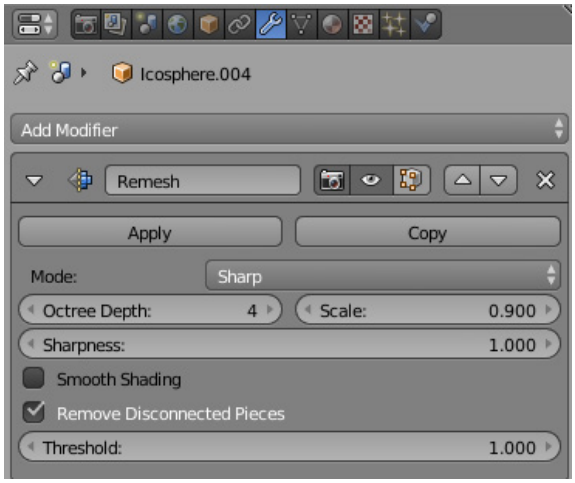

Figure 4-18 *The parameters for the* ***Remesh*** *modifier*

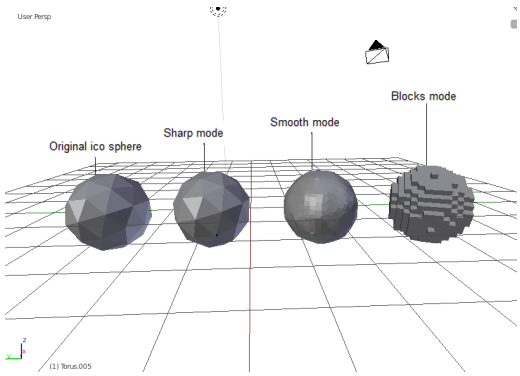

Figure 4-19 *The* ***Remesh*** *modifier added using options in the* ***Mode*** *drop-down*

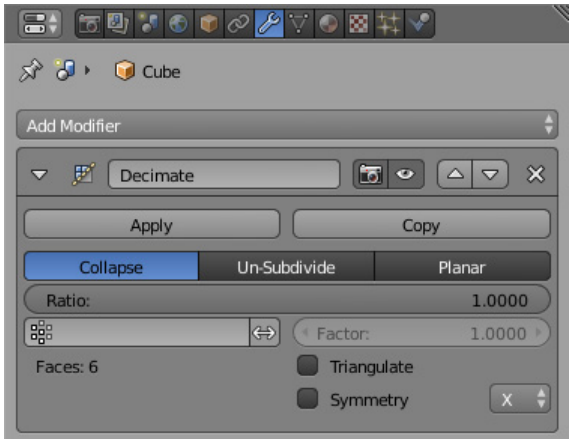

Figure 4-20 *The parameters for the* ***Decimate*** *modifier*

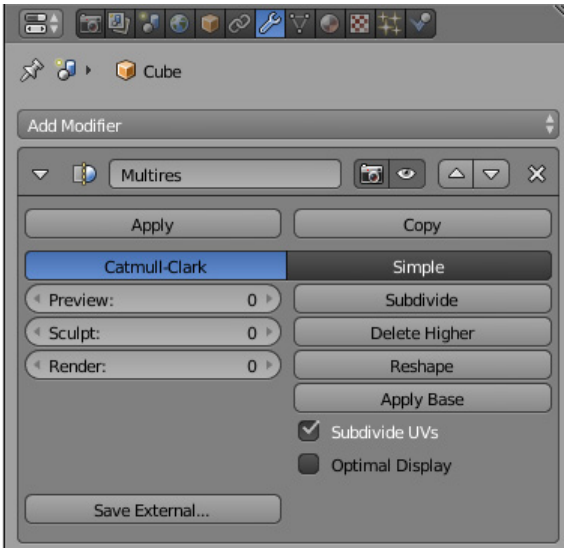

Figure 4-21 *The parameters for the* ***Multiresolution*** *modifier*

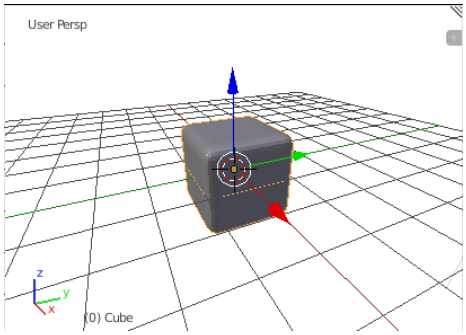

Figure 4-22 *The* ***Multiresolution*** *modifier added to a cube*

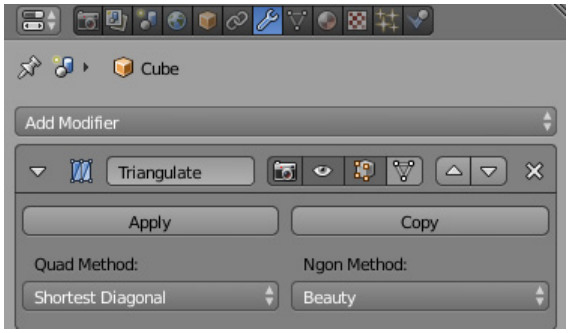

Figure 4-23 *The parameters for the* ***Triangulate*** *modifier*

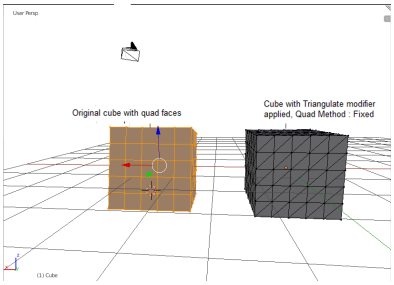

Figure 4-24 *The* ***Triangulate*** *modifier added to a cube*

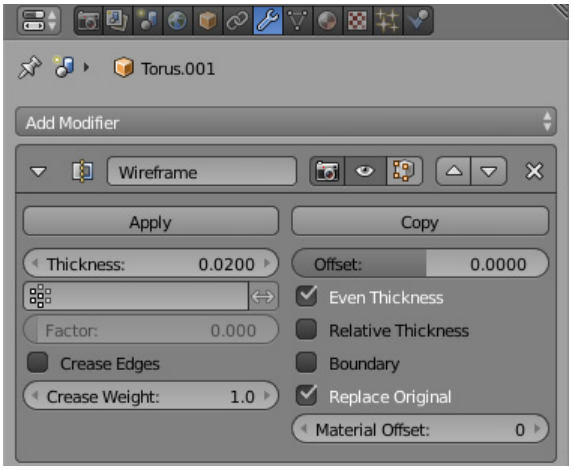

Figure 4-25 *The parameters for the* ***Wireframe*** *modifier*

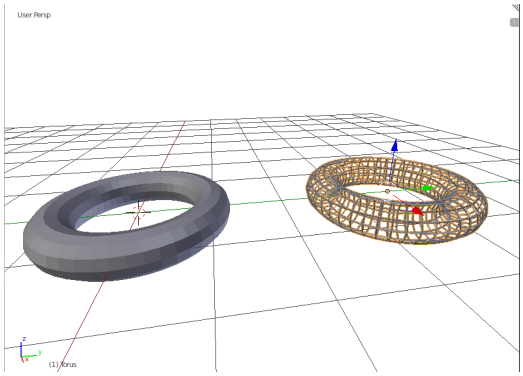

Figure 4-26 *The* ***Wireframe*** *modifier added to a torus*

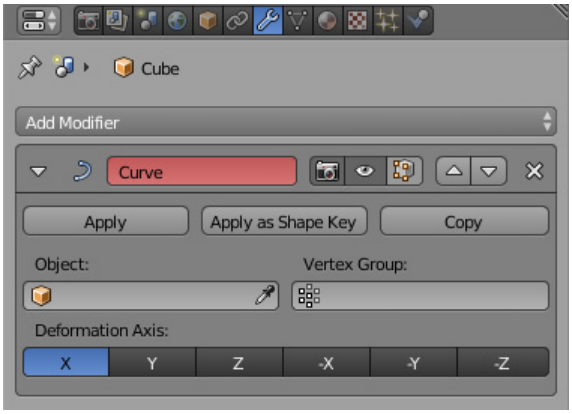

Figure 4-27 *The parameters for the* ***Curve*** *modifier*

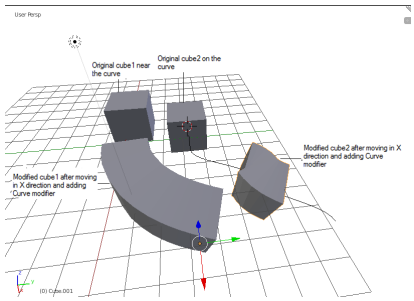

Figure 4-28 *The* ***Curve*** *modifier added to the cubes*

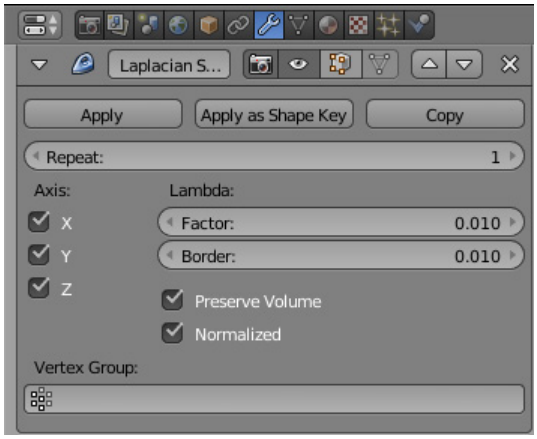

Figure 4-29 *The parameters for the* ***Laplacian Smooth*** *modifier*

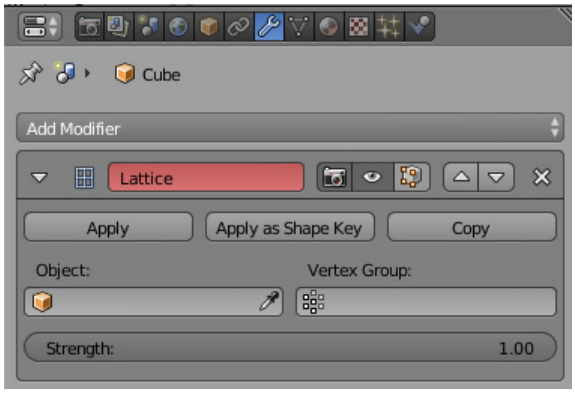

Figure 4-30 *The parameters for the* ***Lattice*** *modifier*

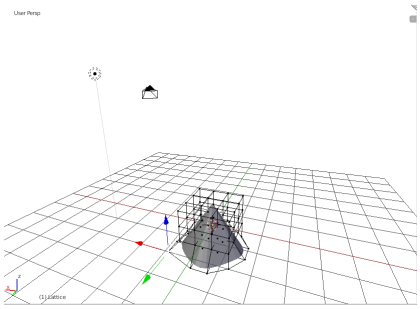

Figure 4-31 *The* ***Lattice*** *modifier added to a cone*

Figure 4-32 *The parameters for the* ***Smooth*** *modifier*

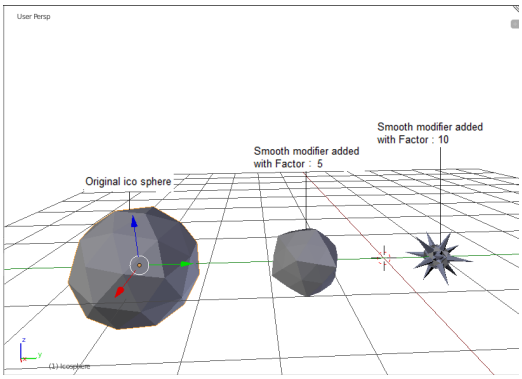

Figure 4-33 *The* ***Smooth*** *modifier added to an icosphere*

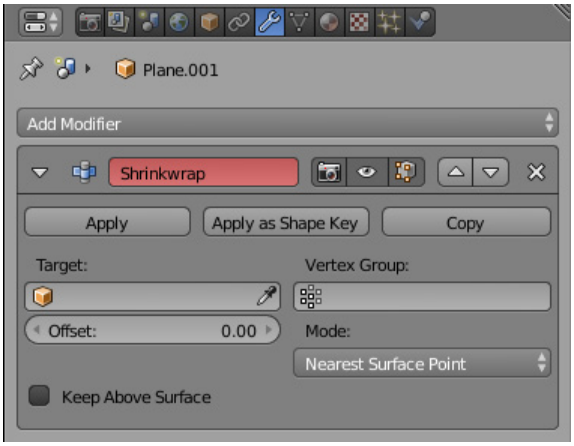

Figure 4-34 *The parameters for the* ***Shrinkwrap*** *modifier*

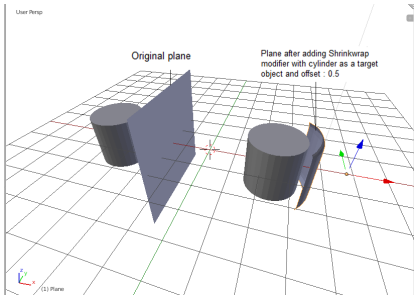

Figure 4-35 *The* ***Shrinkwrap*** *modifier added to a torus*

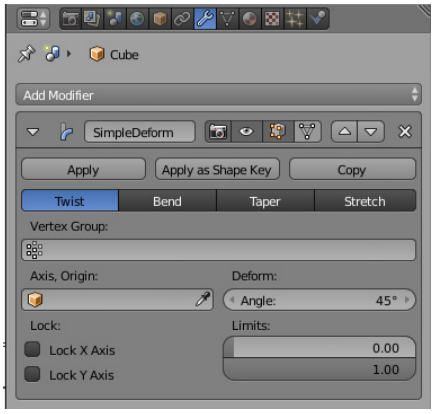

Figure 4-36 *The parameters for the* ***Simple Deform*** *modifier*

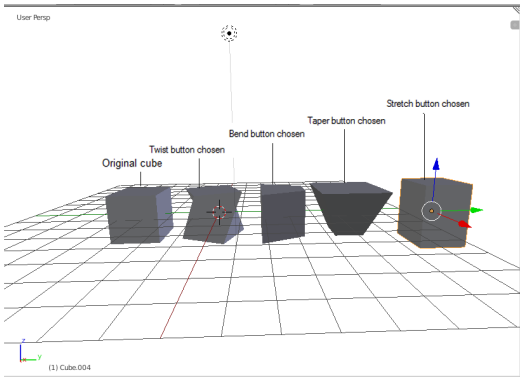

Figure 4-37 *The* ***Simple Deform*** *modifier added to a cube*

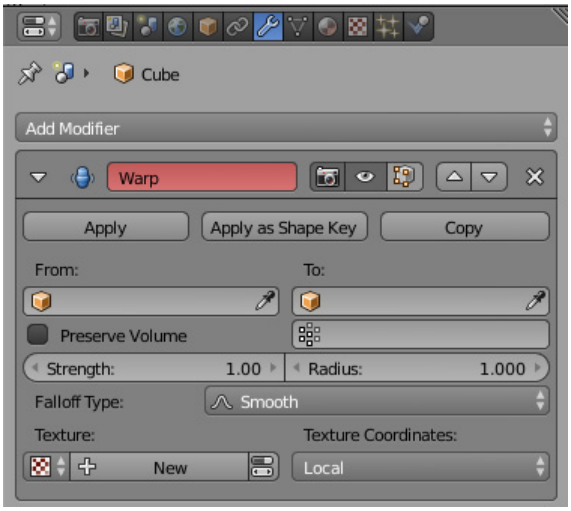

Figure 4-38 *The parameters for the* ***Warp*** *modifier*

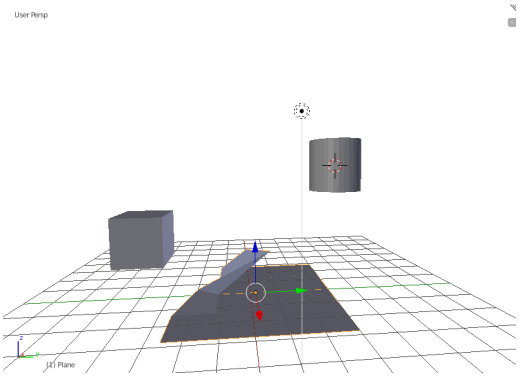

Figure 4-39 *The* ***Warp*** *modifier added to a plane*

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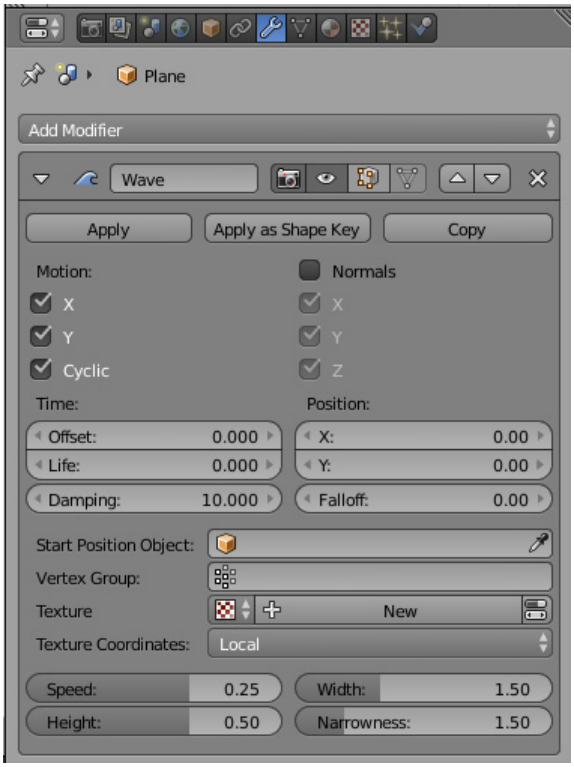

Figure 4-40 *The parameters for the* ***Wave*** *modifier*

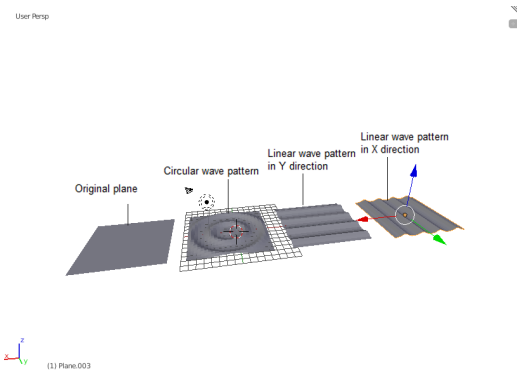

Figure 4-41 *The* ***Wave*** *modifier added to a plane*

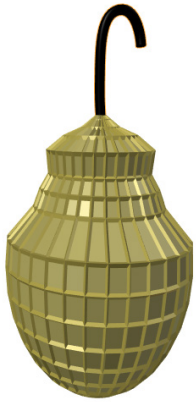

Figure 4-42 *The model of a hanging lamp*

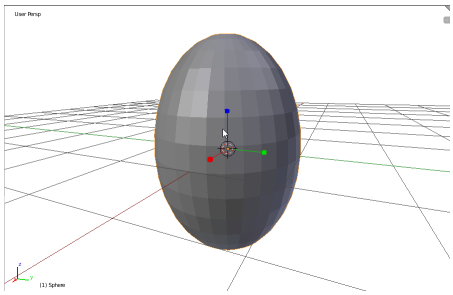

Figure 4-43 *The lamp cover scaled*

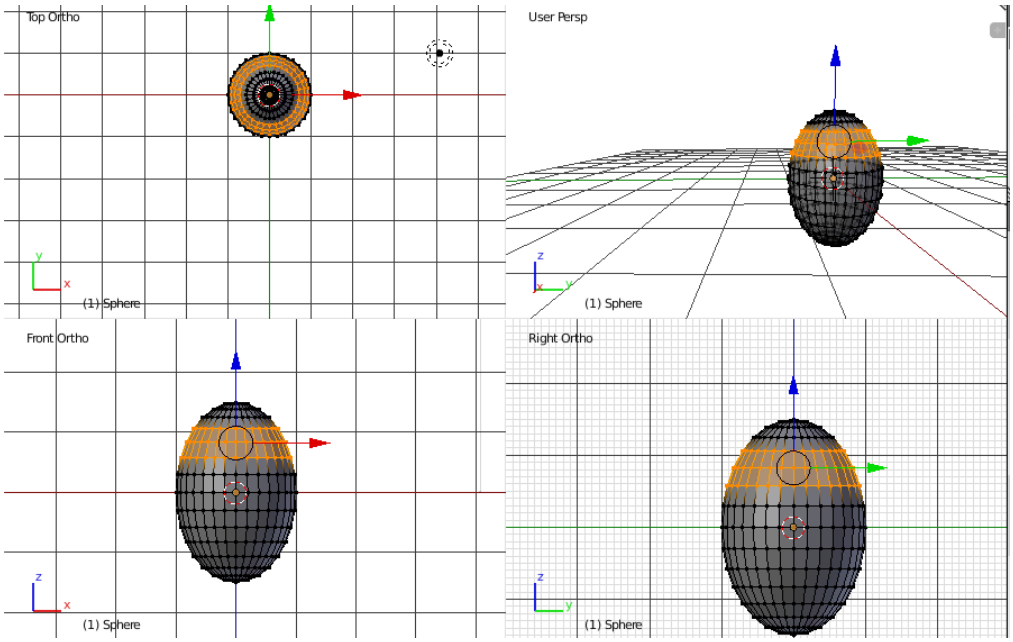

Figure 4-44 *Selected vertices of lamp cover*

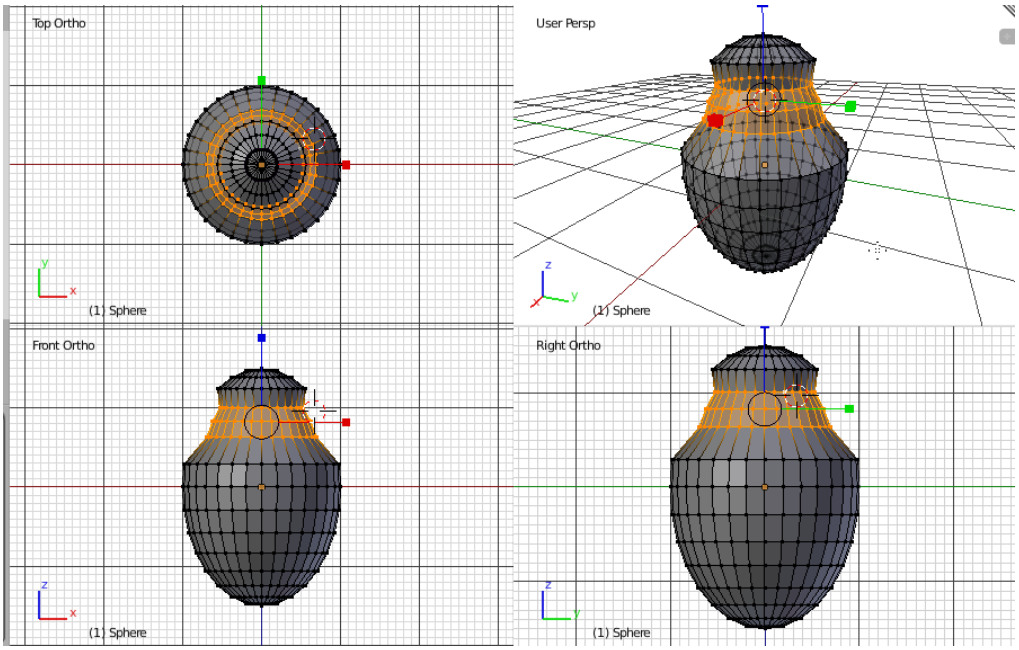

Figure 4-45 *Selected vertices of lamp cover scaled*

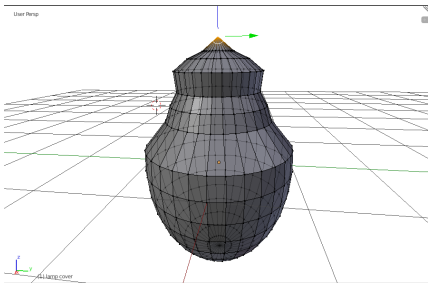

Figure 4-46 *Topmost vertex moved*

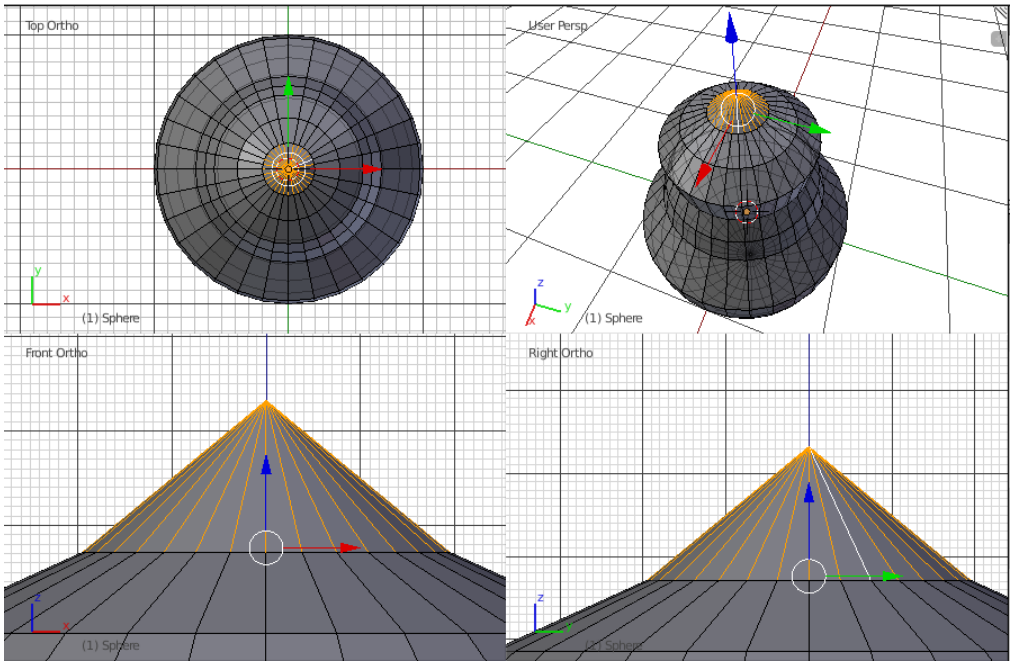

Figure 4-47 *Topmost edges selected*

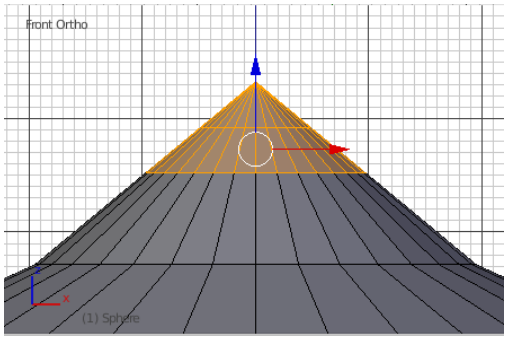

Figure 4-48 *Selected edges subdivided*

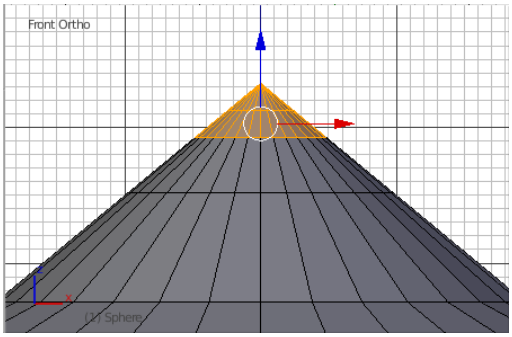

Figure 4-49 *Selected edges subdivided*

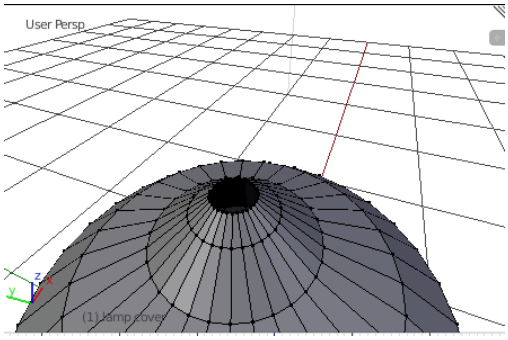

Figure 4-50 *Hole created at the top of lamp cover*

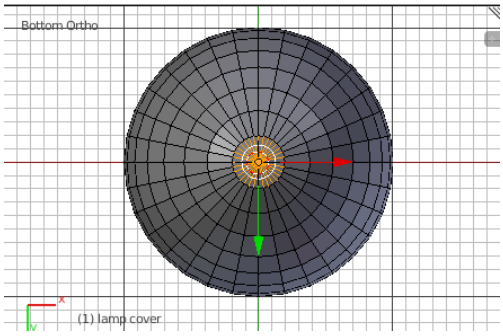

Figure 4-51 *Bottommost edges selected*

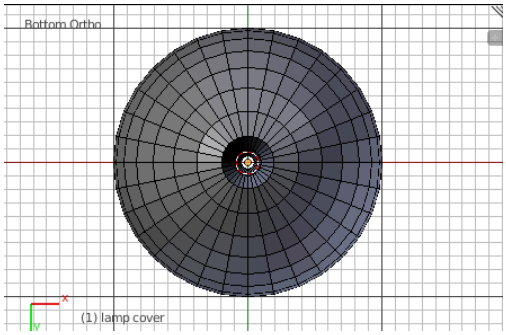

Figure 4-52 *Hole created at the bottom of lamp cover*

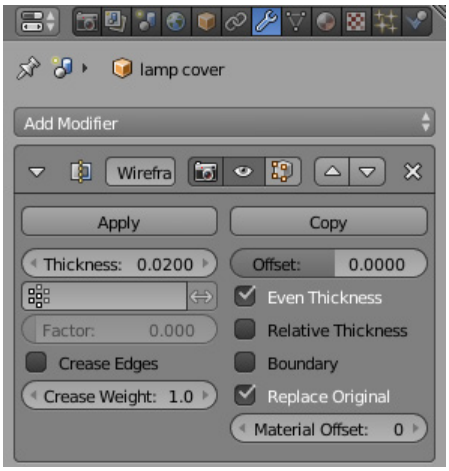

Figure 4-53 *The parameters for the* ***Wireframe*** *modifier*

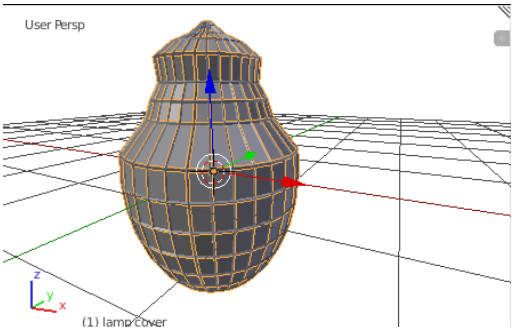

Figure 4-54 *The lamp cover with default settings of the* ***Wireframe*** *modifier*

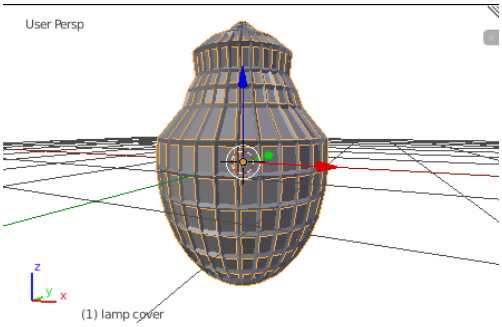

Figure 4-55 *The lamp cover with changed settings of the* ***Wireframe*** *modifier*

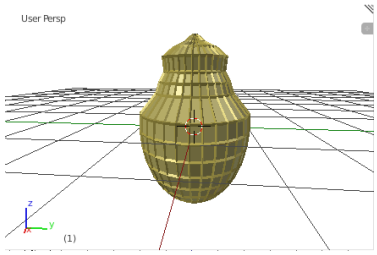

Figure 4-56 *Color of lamp cover and lamp cover 001 changed*

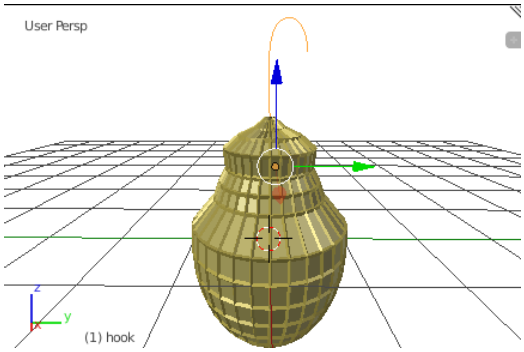

Figure 4-57 *The changed shape of hook*

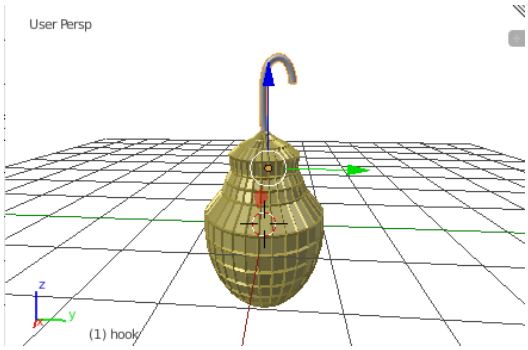

Figure 4-58 *The hook modified*

Figure 4-59 *The model of a flower*

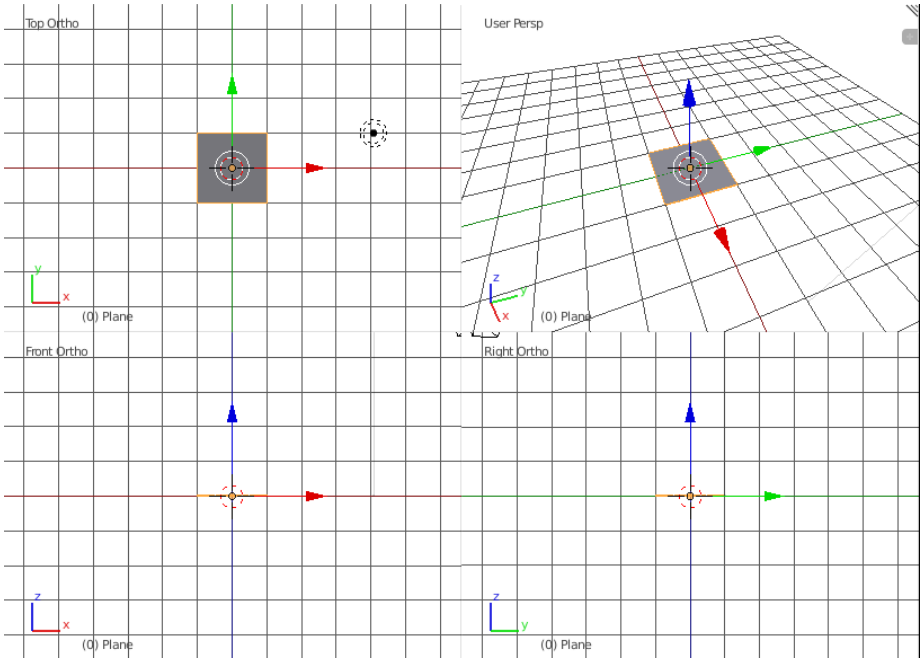

Figure 4-60 *The plane created in the view*

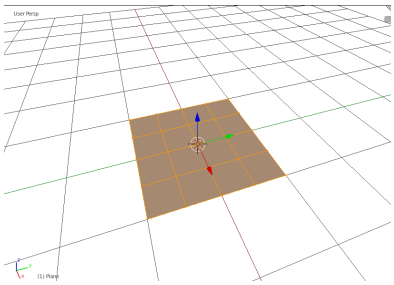

Figure 4-61 *The petal subdivided*

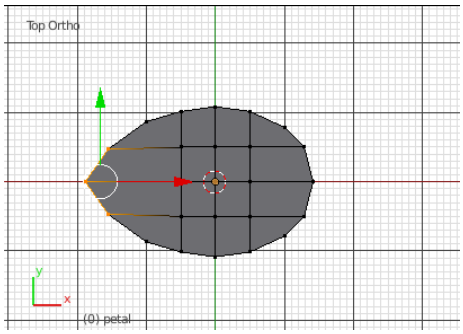

Figure 4-62 *The petal shape created*

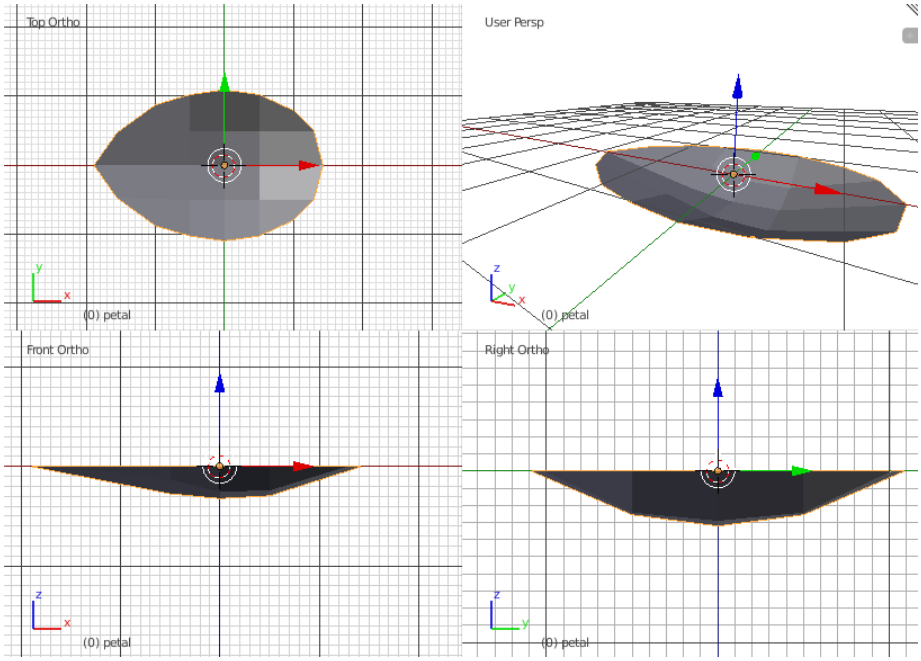

Figure 4-63 *Vertices of petal moved in Z direction*

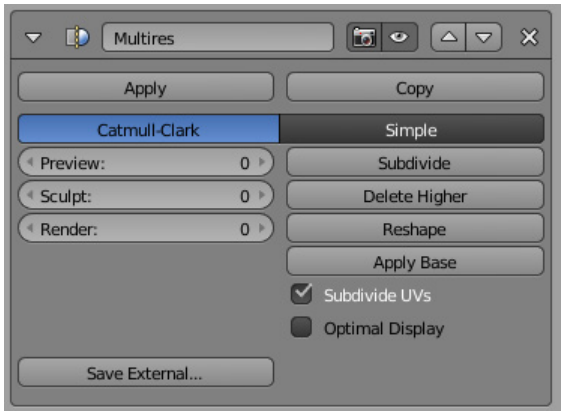

Figure 4-64 *The parameters for the* ***Multiresolution*** *modifier*

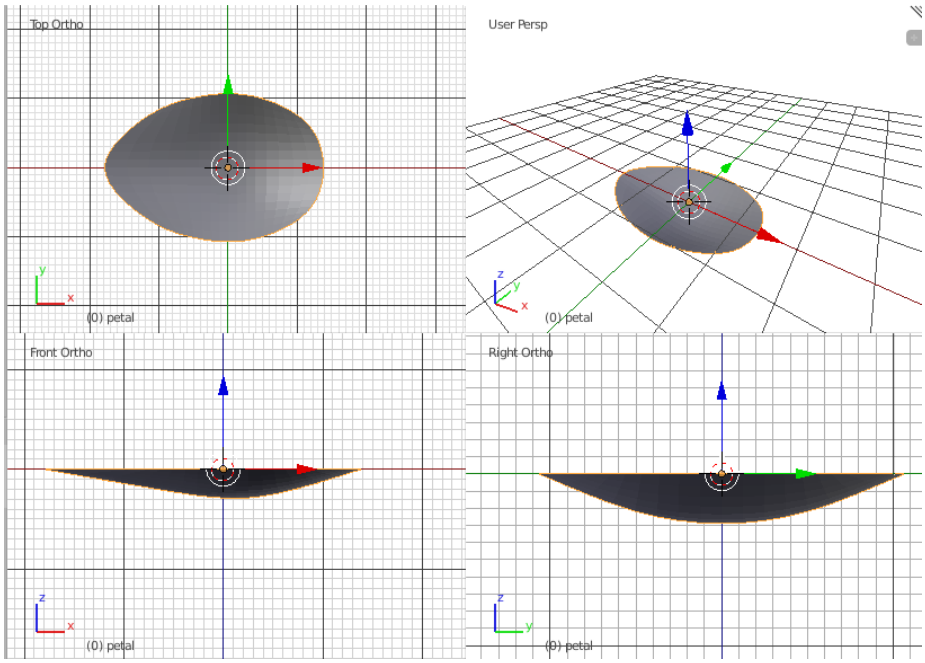

Figure 4-65 *The petal subdivided*

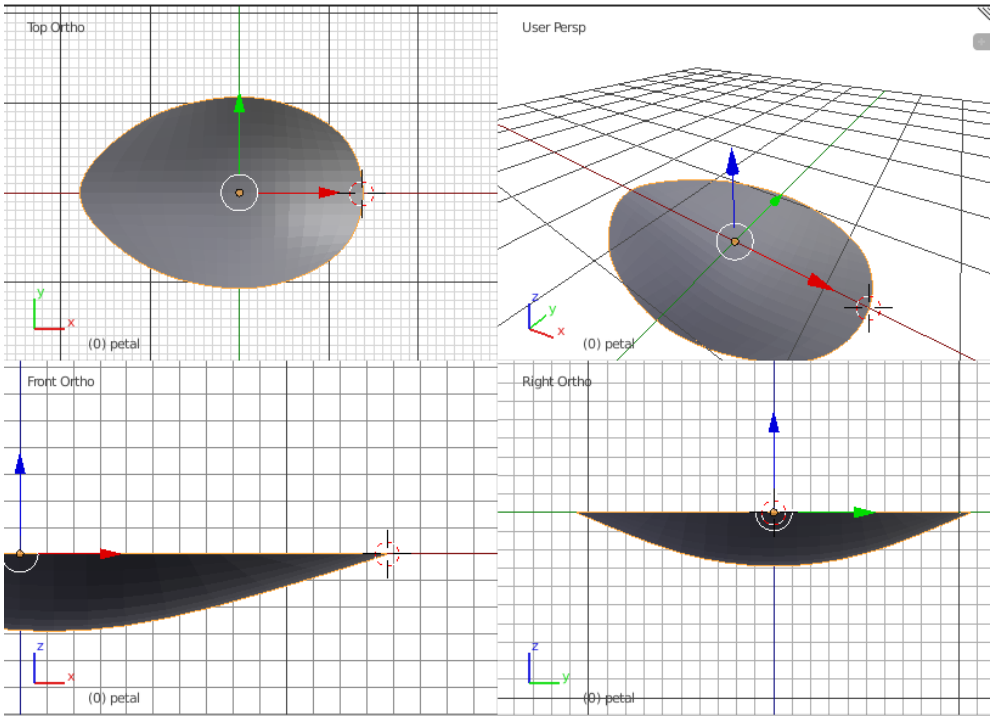

Figure 4-66 *The 3D Cursor aligned*

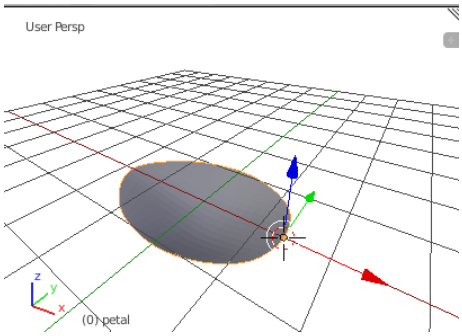

Figure 4-67 *Pivot point of petal shifted*

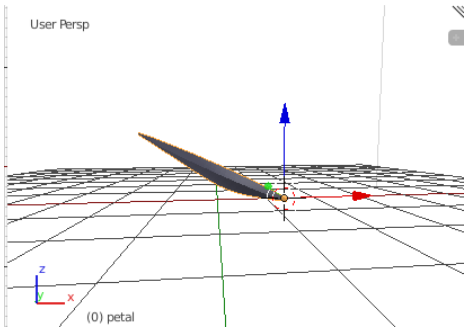

Figure 4-68 *The petal tilted*

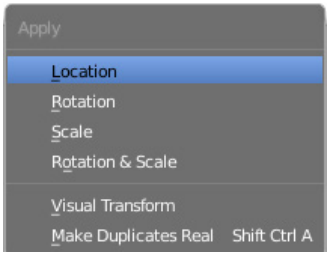

Figure 4-69 *The* ***Apply*** *menu*

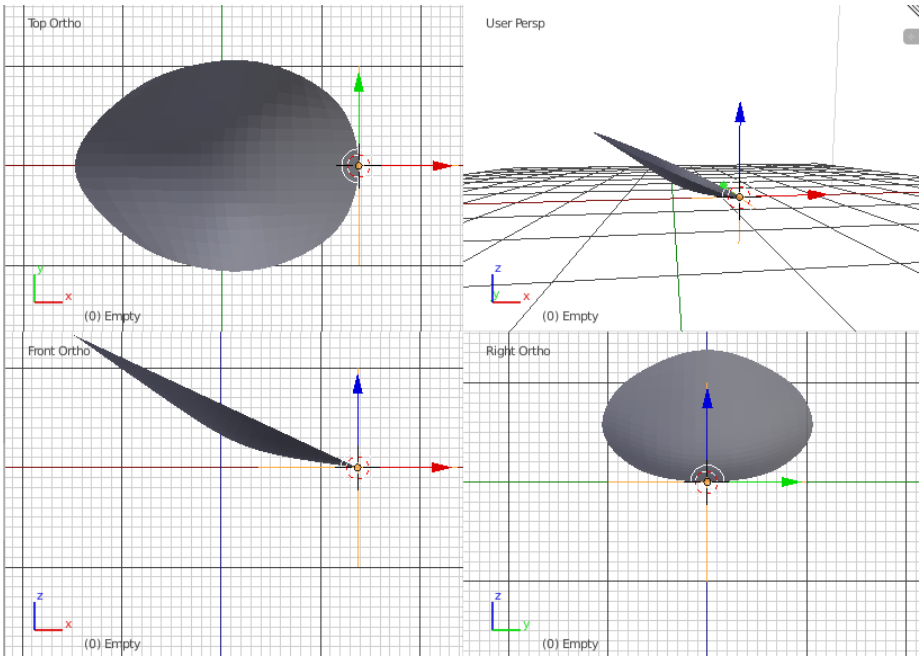

Figure 4-70 *The Empty object in all the views*

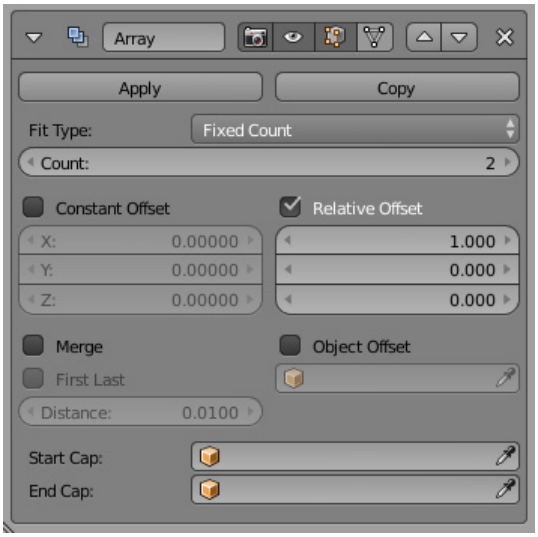

Figure 4-71 *The parameters for the* ***Array*** *modifier*

.

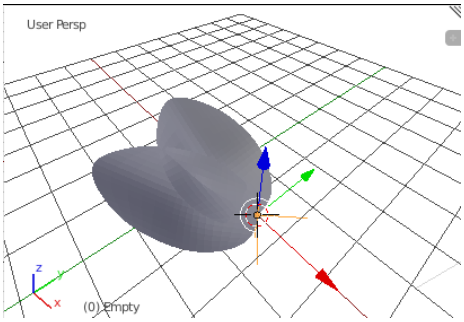

Figure 4-72 *Second petal created*

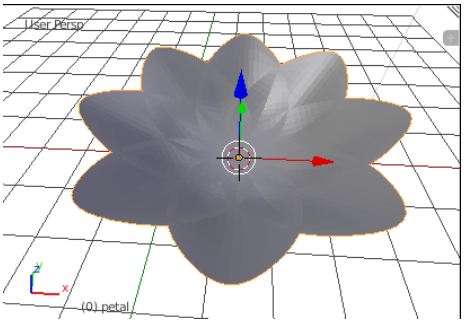

Figure 4-73 *The flower created*

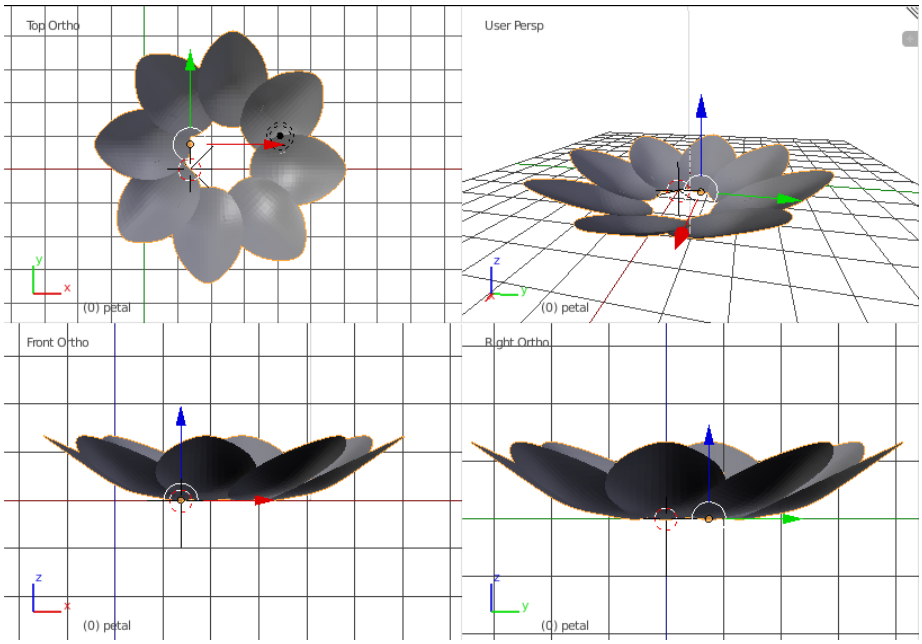

Figure 4-74 *The Empty moved along Y axis*

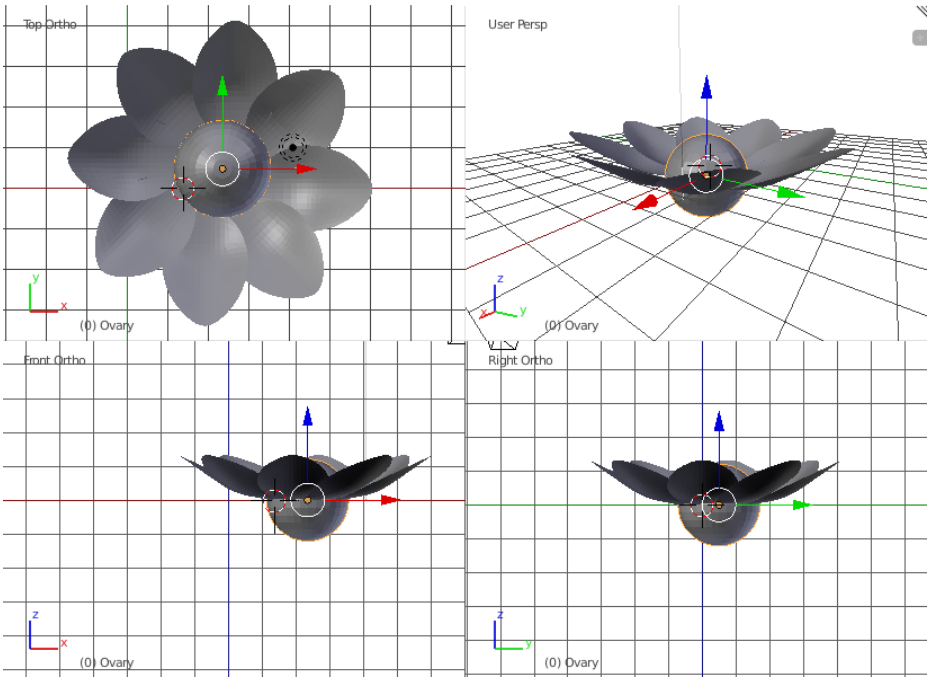

Figure 4-75 *The ovary aligned in all the views*

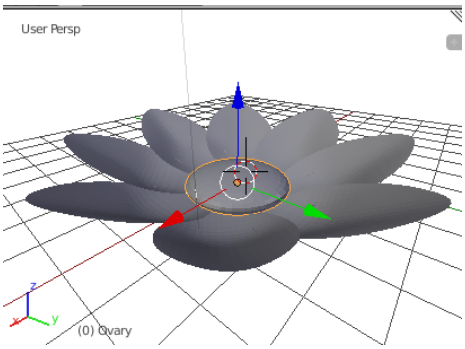

Figure 4-76 *The Ovary scaled and moved*

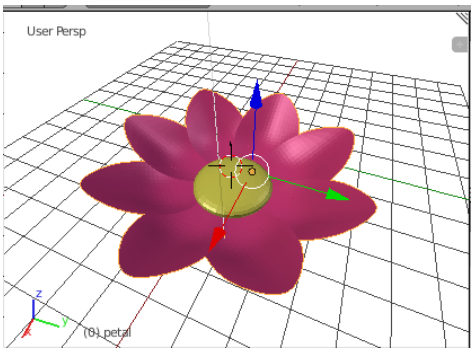

Figure 4-77 *Color of petal and ovary changed*

Figure 4-78 *Model of a sofa set*

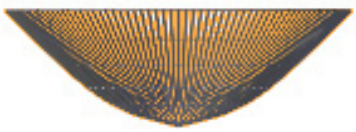

Figure 4-79 *Side view of a fruit basket*

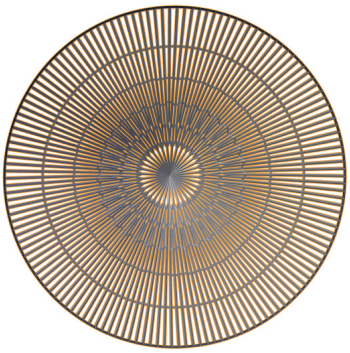

Figure 4-80 *Top view of a fruit basket*

Chapter 5

Digital Sculpting Techniques

Learning Objectives

After completing this chapter, you will be able to:

- *Understand Sculpt Mode*
- *Understand types of brushes and strokes*
- *Understand the Spin tool*

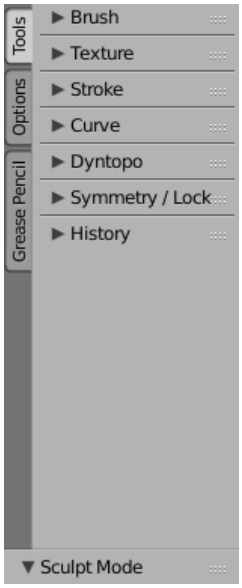

Figure 5-1 *Various panels in the* ***Tools*** *tab*

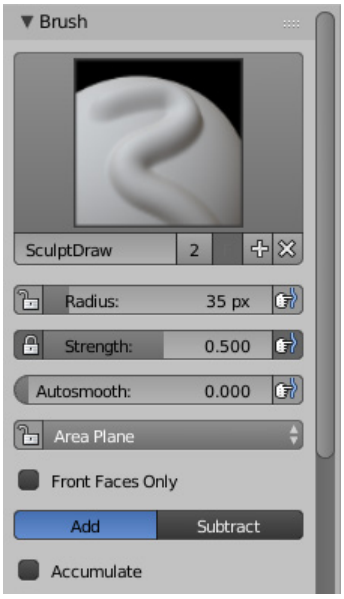

Figure 5-2 *The options in the* ***Brush*** *panel*

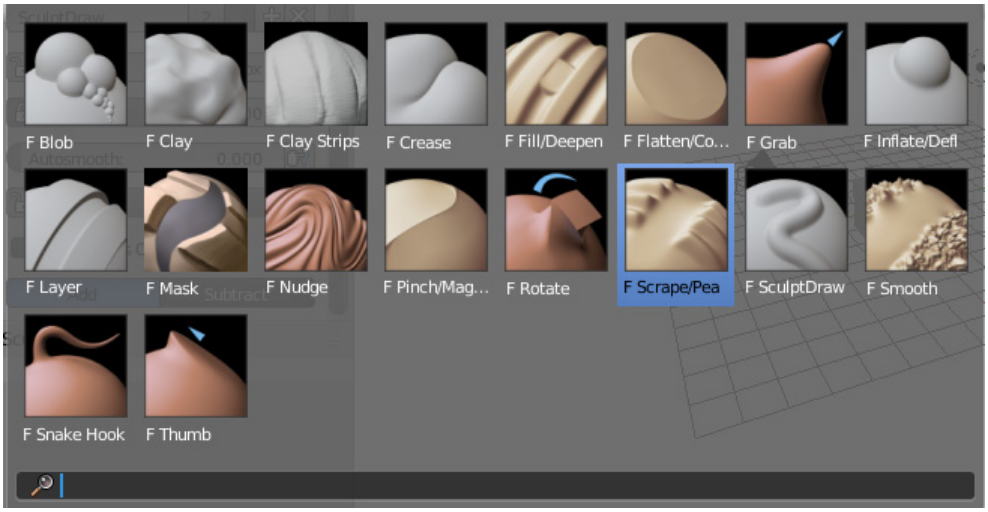

Figure 5-3 *The Flyout displaying various brush types*

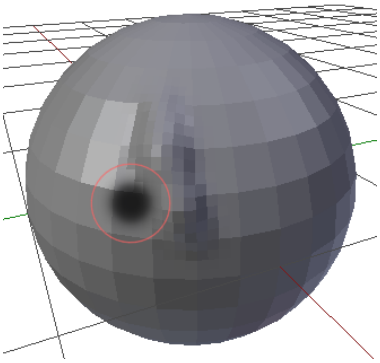

Figure 5-4 *A blurred black circle displayed*

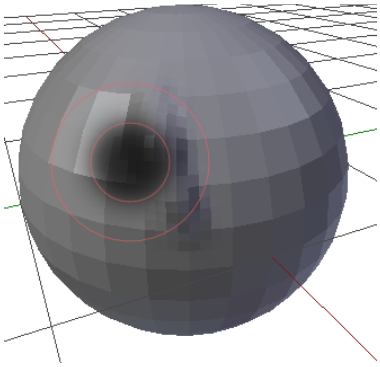

Figure 5-5 *Dragging the cursor*

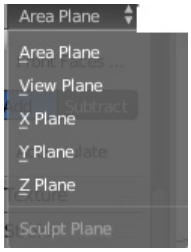

Figure 5-6 *The* ***Sculpt Plane*** *drop-down*

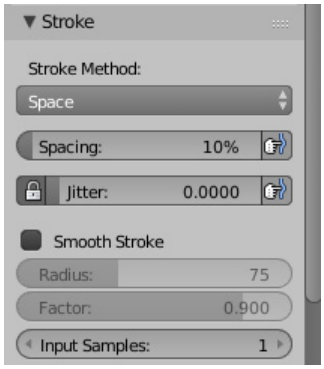

Figure 5-7 *The* ***Stroke*** *panel*

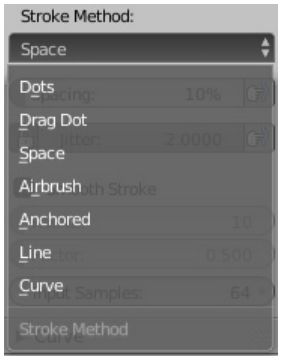

Figure 5-8 *The* ***Stroke Method*** *drop-down*

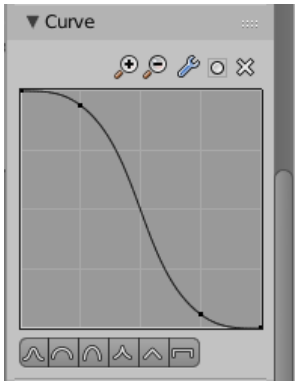

Figure 5-9 *The* ***Curve*** *panel*

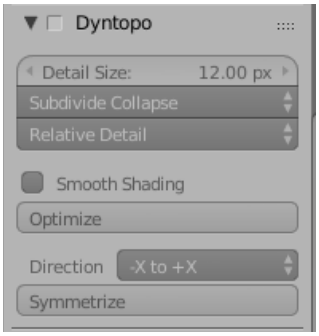

Figure 5-10 *The* ***Dyntopo***

Figure 5-11 *The* ***Dyntopo*** *panel on selecting the* ***Dyntopo*** *check box*

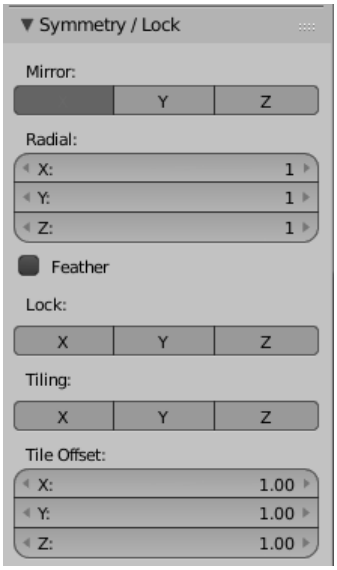

Figure 5-12 *The* ***Symmetry/Lock*** *panel*

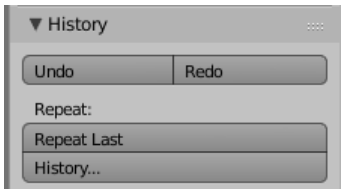

Figure 5-13 *The* ***History*** *panel*

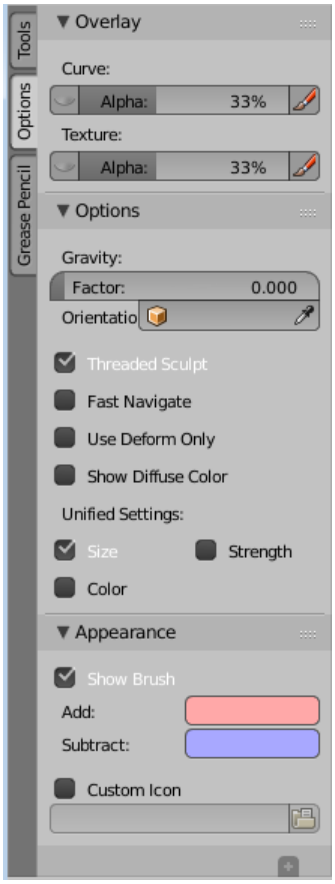

Figure 5-14 *Various panels in the* ***Options*** *tab*

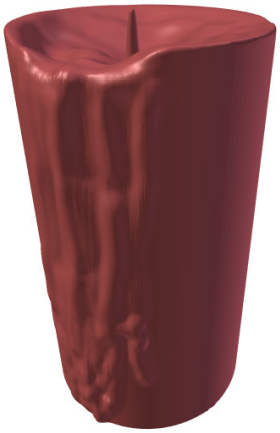

Figure 5-15 *The sculpted candle*

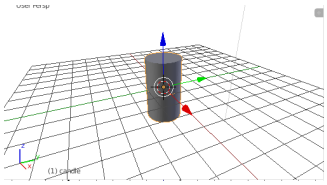

Figure 5-16 *The candle displayed*

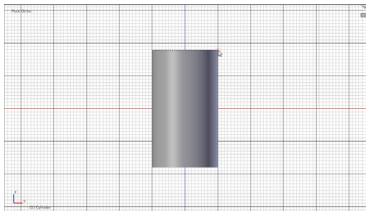

Figure 5-17 *Applying the stroke in the Front Ortho view*

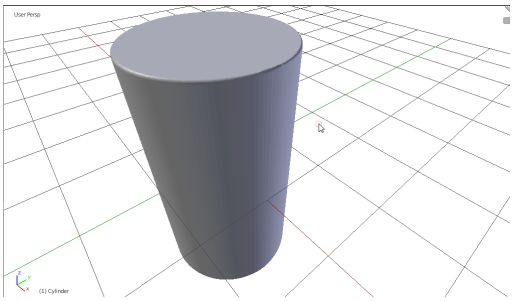

Figure 5-18 *Top circular edge smoothened*

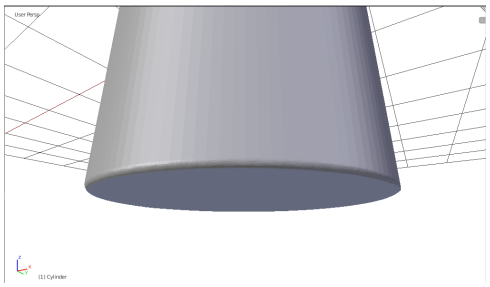

Figure 5-19 *Bottom circular edge smoothened*

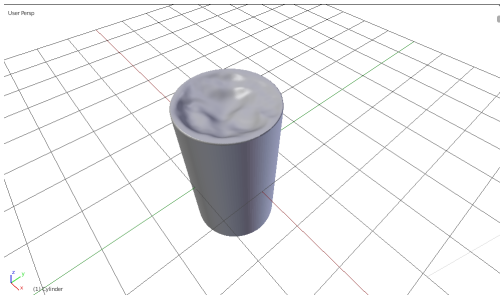

Figure 5-20 *Strokes applied on the top face of candle*

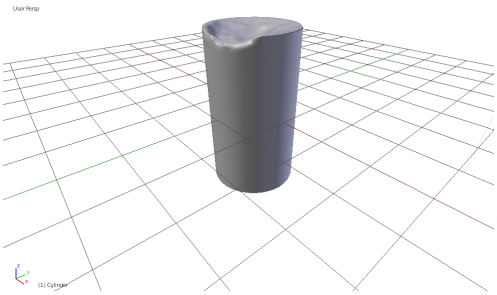

Figure 5-21 *Strokes applied on the top circular edge of candle*

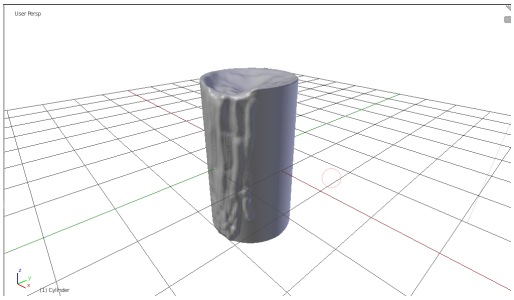

Figure 5-22 *Strokes applied on candle*

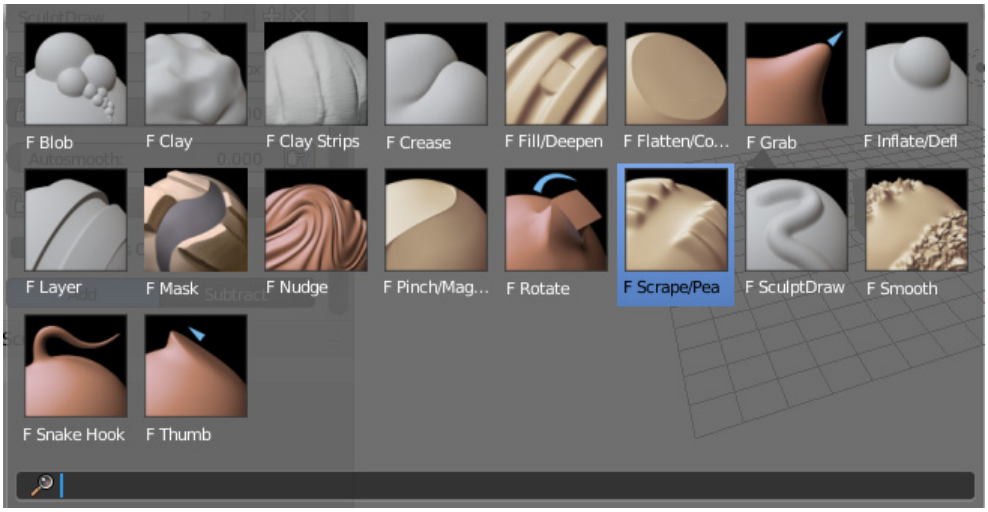

Figure 5-23 *The Flyout displayed on clicking the current brush type image*

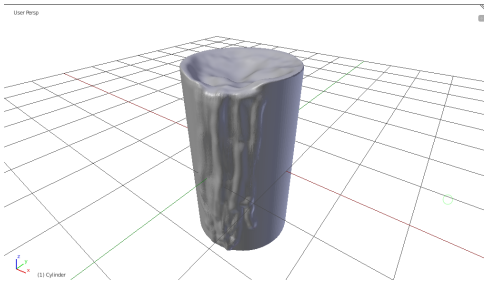

Figure 5-24 *Adjusting the view of candle*

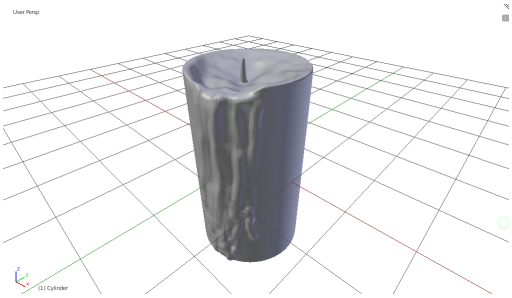

Figure 5-25 *Wick of candle created*

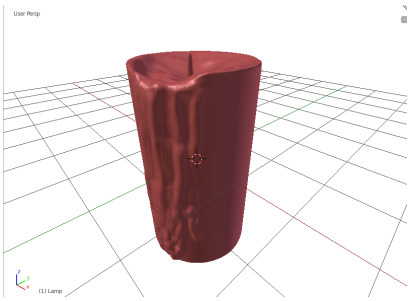

Figure 5-26 *Color of candle changed*

Figure 5-27 *The sculpted pot (view 1)*

Figure 5-28 *The sculpted pot (view 2)*

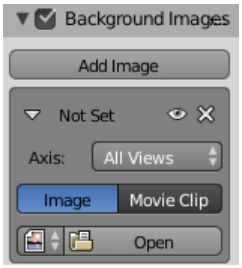

Figure 5-29 *The* ***Not Set*** *area in the* ***Background Images*** *panel*

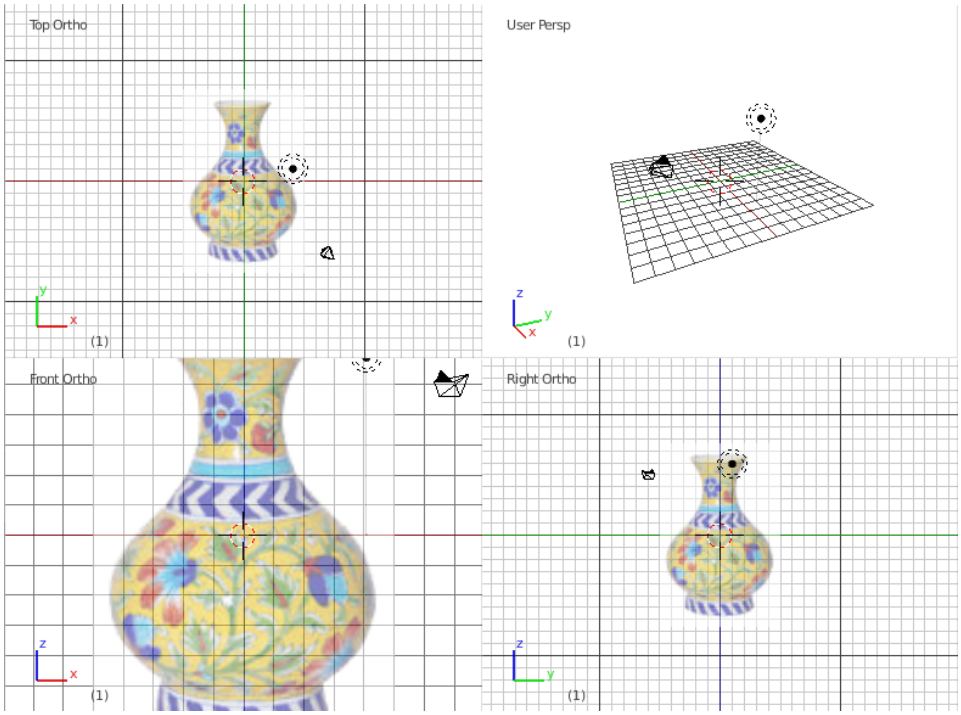

Figure 5-30 *The selected image in ortho views*

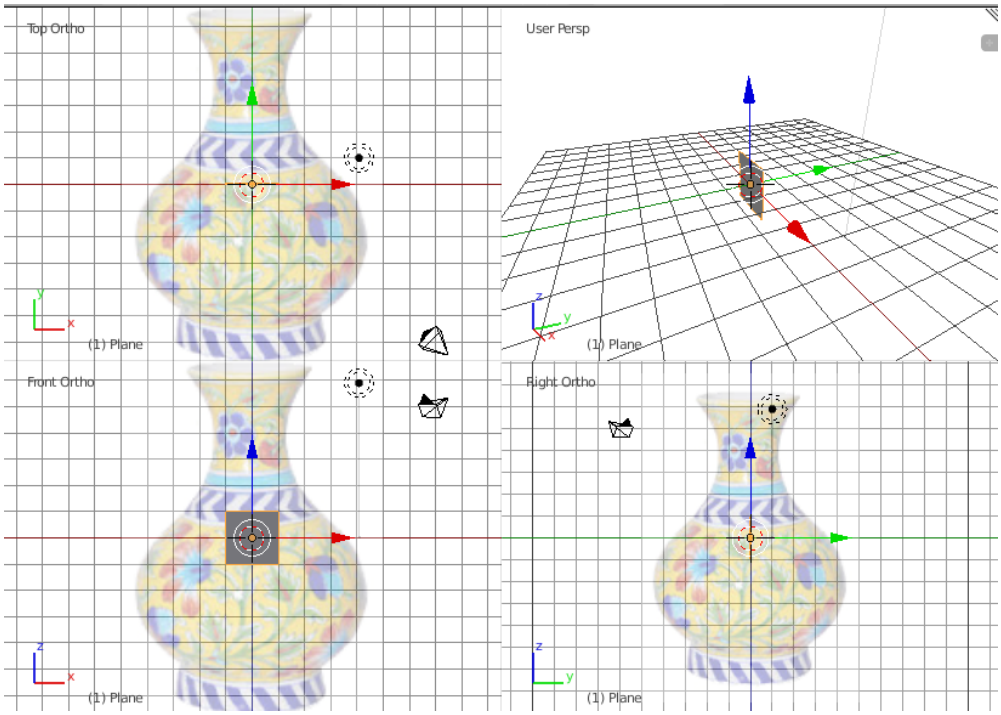

Figure 5-31 *The rotated plane*

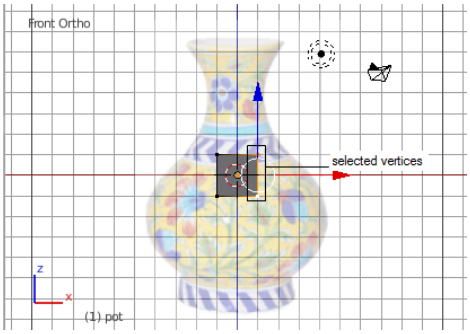

Figure 5-32 *Selected vertices of pot*

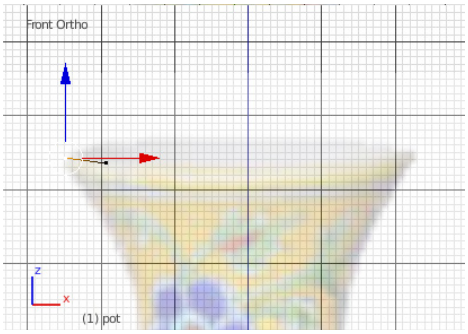

Figure 5-33 *Two vertices of pot placed*

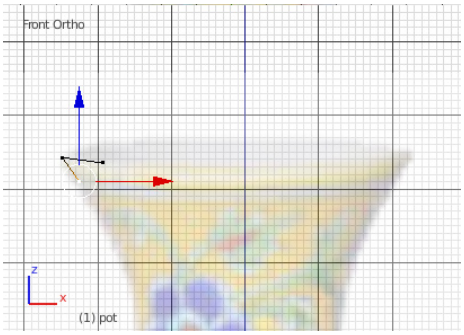

Figure 5-34 *The vertex placed*

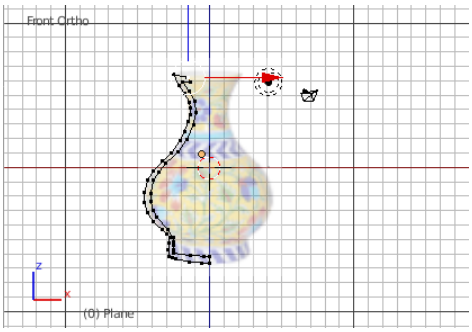

Figure 5-35 *The profile created*

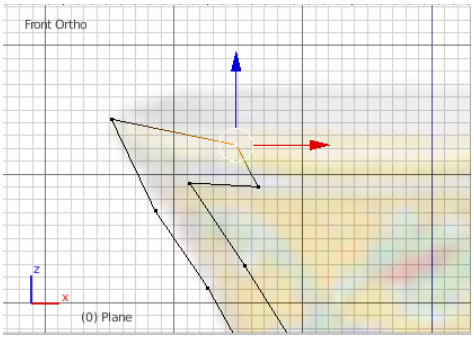

Figure 5-36 *Two vertices of pot joined*

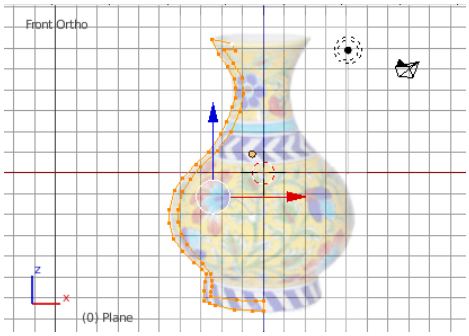

Figure 5-37 *Selecting all the vertices of pot*

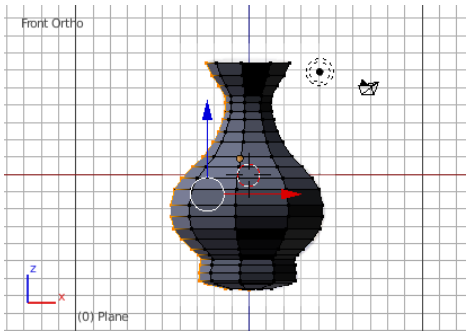

Figure 5-38 *The pot created*

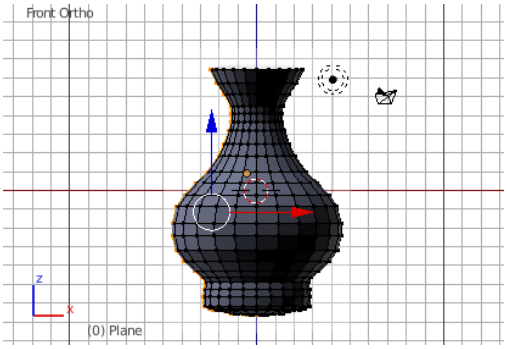

Figure 5-39 *Smoothness of pot increased*

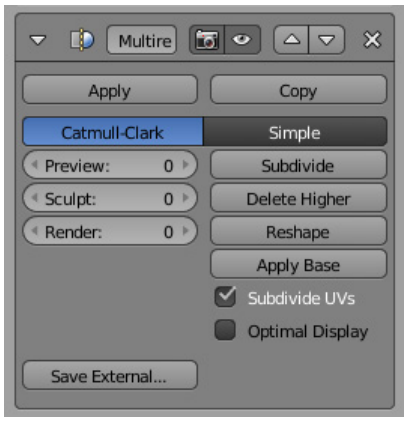

Figure 5-40 *The parameters of the* ***Multiresolution*** *modifier*

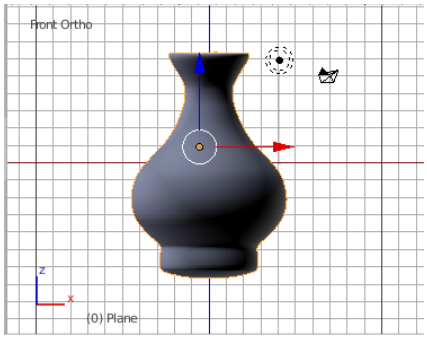

Figure 5-41 *The pot smoothened*

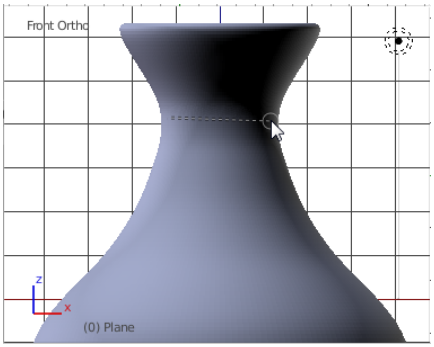

Figure 5-42 *Applying the stroke*

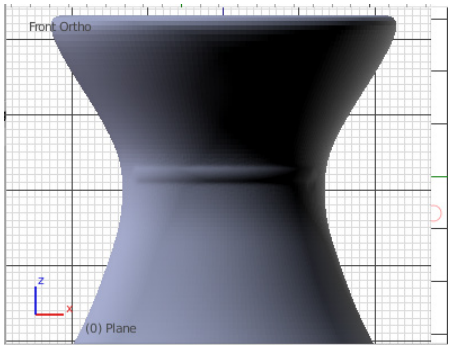

Figure 5-43 *The stroke on pot*

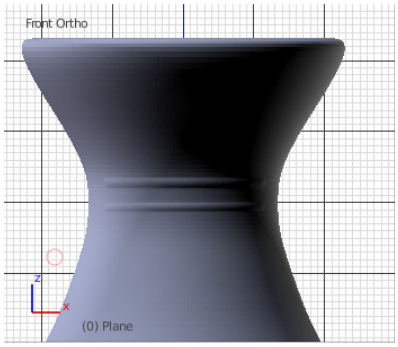

Figure 5-44 *Second stroke at the bottom of first stroke*

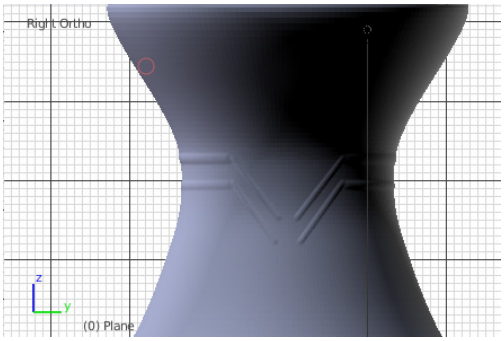

Figure 5-45 *Strokes applied in the Right Ortho view*

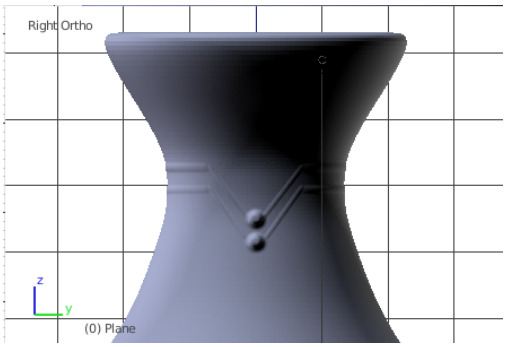

Figure 5-46 *Dots created on pot*

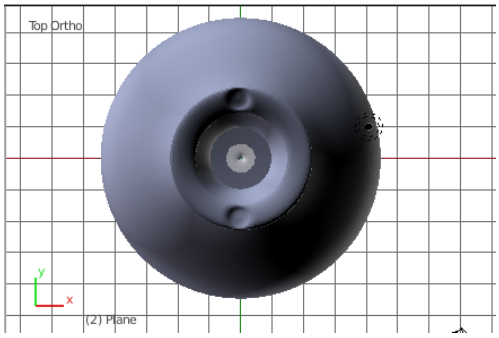

Figure 5-47 *Stroke applied on the top face of pot*

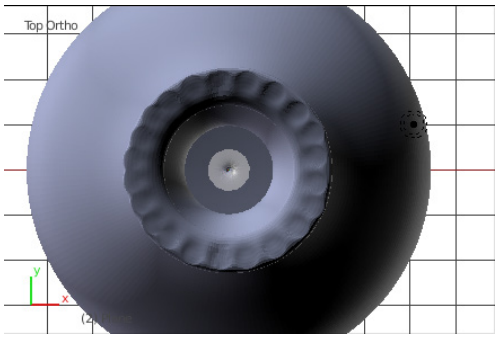

Figure 5-48 *Strokes applied on the top face of pot*

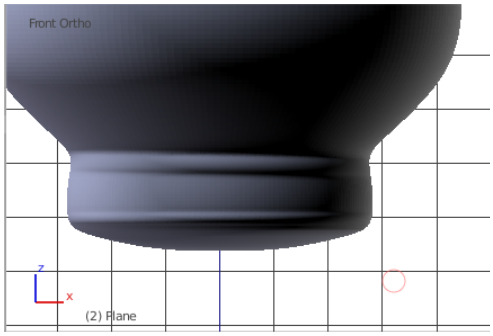

Figure 5-49 *Strokes applied on pot*

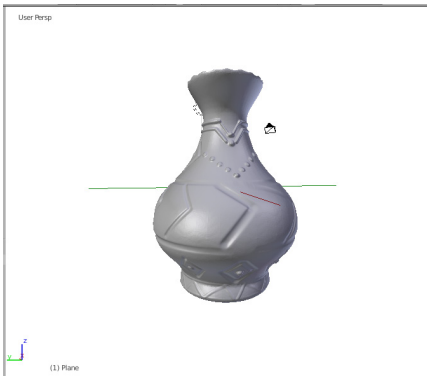

Figure 5-50 *Design created on pot (view 1)*

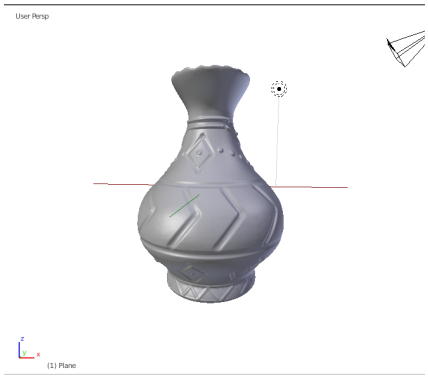

Figure 5-51 *Design created on pot (view 2)*

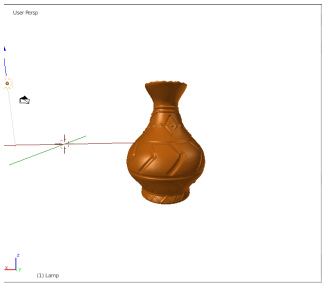

Figure 5-52 *Color of pot changed*

Figure 5-53 *Model of a sculpted mug*

Figure 5-54 *Model of a sculpted photoframe*

Chapter 6

Working with Materials - I

Learning Objectives

After completing this chapter, you will be able to:

- ***Understand the*** *Blender Render* ***and*** *Cycles Render* ***engines***
- ***Create, assign, modify, and delete materials***
- ***Apply textures to the object***
- ***Apply multiple materials to the object***
- ***Apply multiple textures to the object***
- ***Create background for the scene***

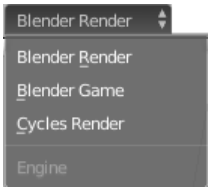

Figure 6-1 *The* ***Engine*** *drop-down*

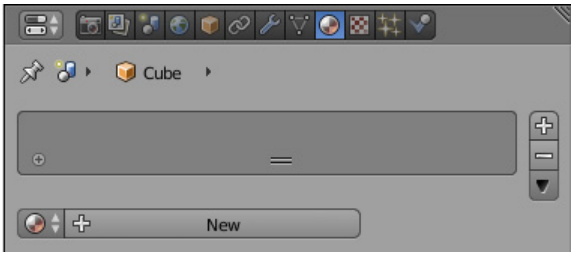

Figure 6-2 *Modified* ***Properties Editor*** *on choosing the* ***Material*** *button*

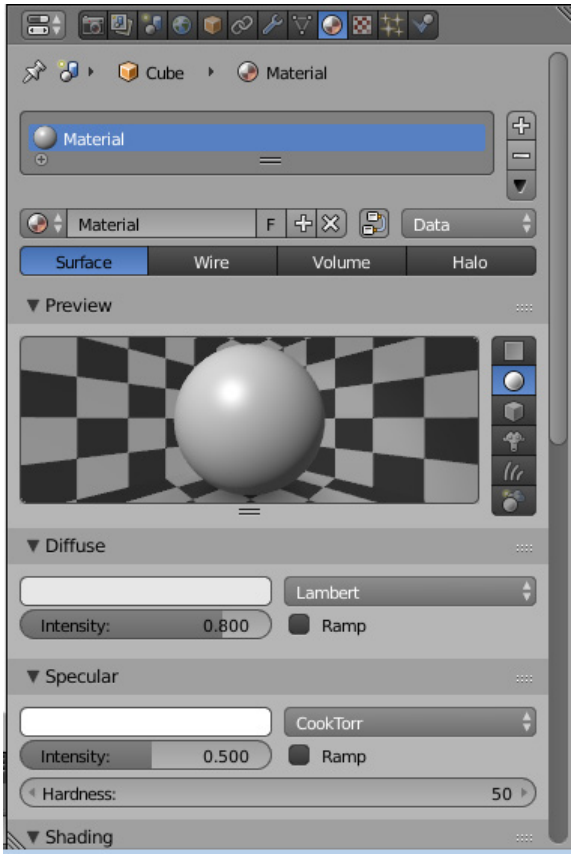

Figure 6-3 *New material created in* ***Properties Editor***

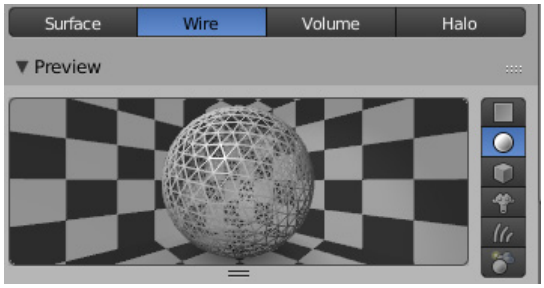

Figure 6-4 *Preview of rendered edges of the object*

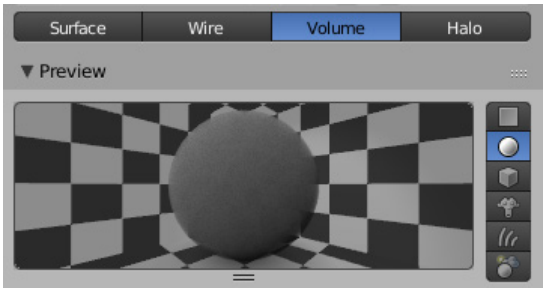

Figure 6-5 *Preview of render on choosing the* ***Volume*** *button*

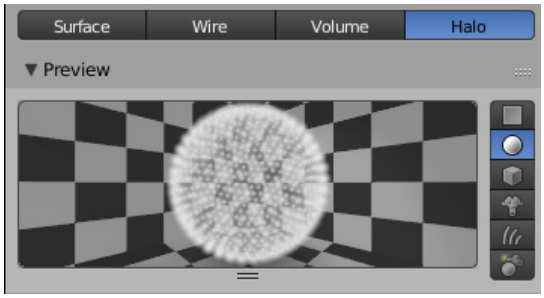

Figure 6-6 *Preview of render on choosing the* ***Halo*** *button*

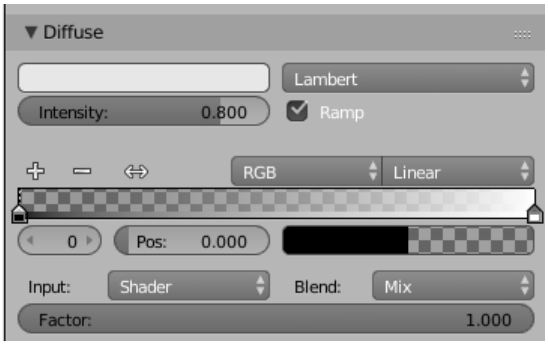

Figure 6-7 *Parameters added to the* ***Diffuse*** *panel*

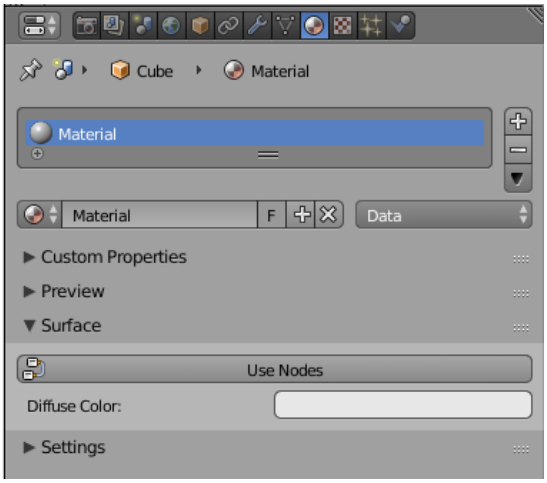

Figure 6-8 *Default parameters in* ***Properties Editor*** *for the Cycles Render engine*

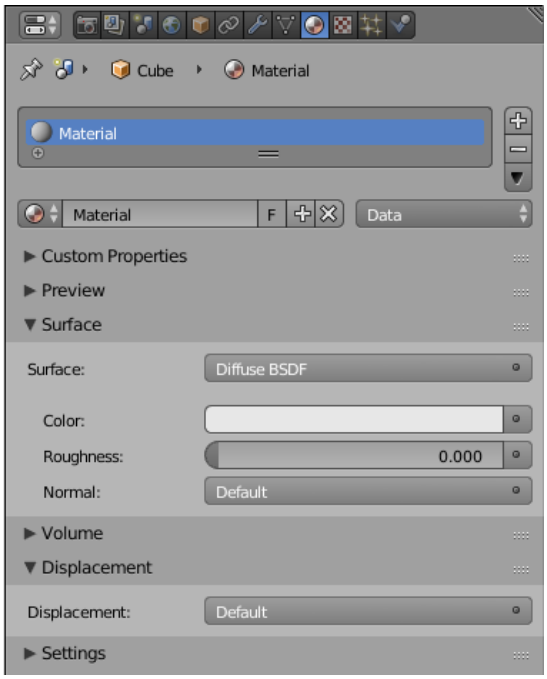

Figure 6-9 *Modified* ***Properties Editor*** *for the Cycles Render engine*

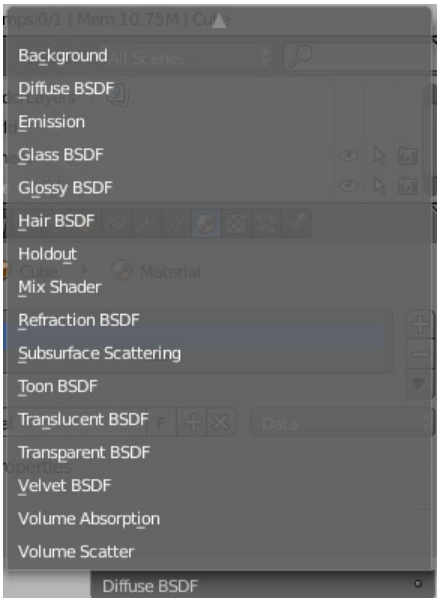

Figure 6-10 *The options in the* ***Surface*** *drop-down*

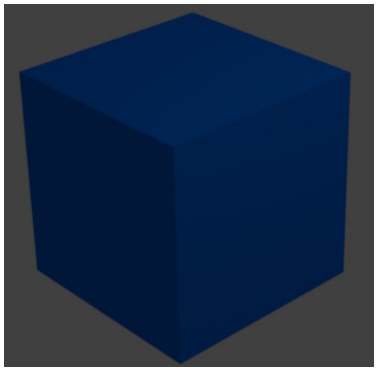

Figure 6-11 ***Diffuse BSDF*** *appiled to an object*

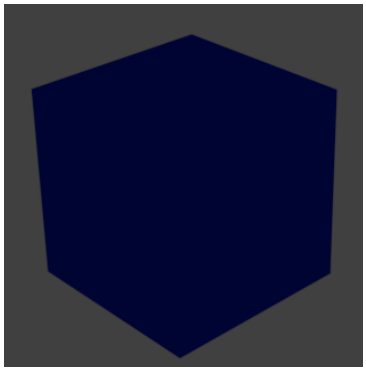

Figure 6-12 ***Transparent BSDF*** *appiled to an object*

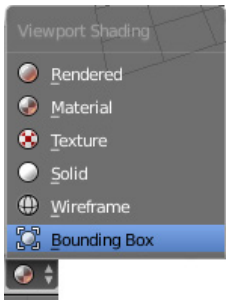

Figure 6-13 *The* ***Viewport Shading*** *drop-down*

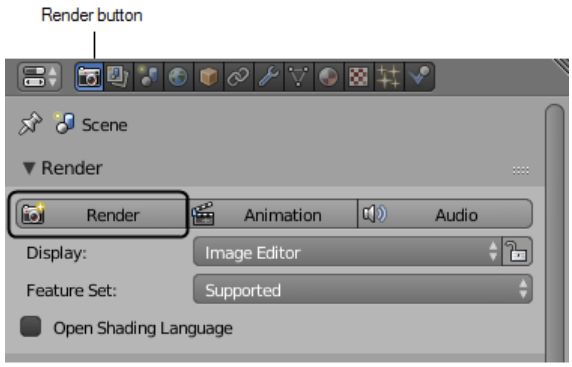

Figure 6-14 *The* ***Render*** *button in the* ***Render*** *panel*

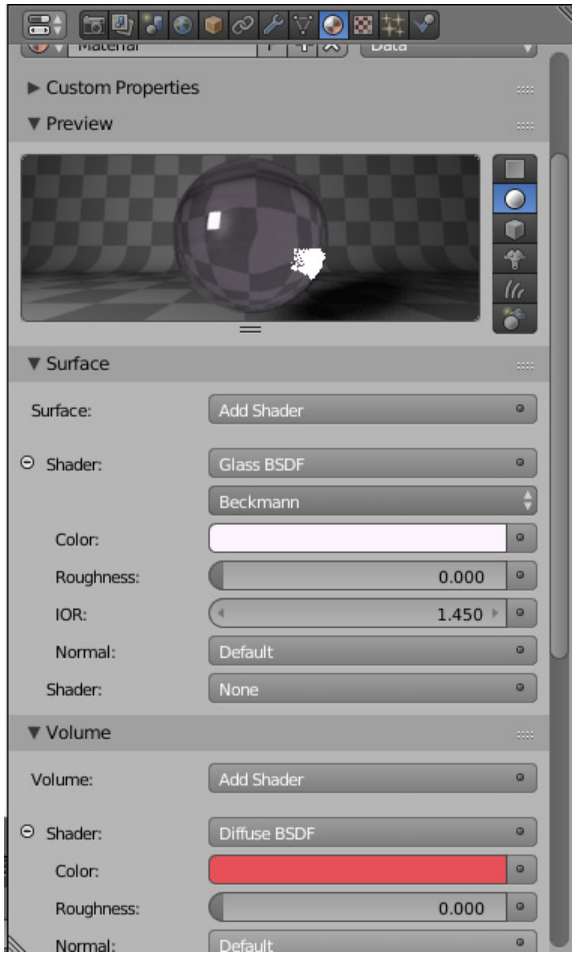

Figure 6-15 *The* ***Glass BSDF*** *and* ***Diffuse BSDF*** *shaders and their parameters in* ***Properties Editor***

Figure 6-16 *Rendered image of a sphere*

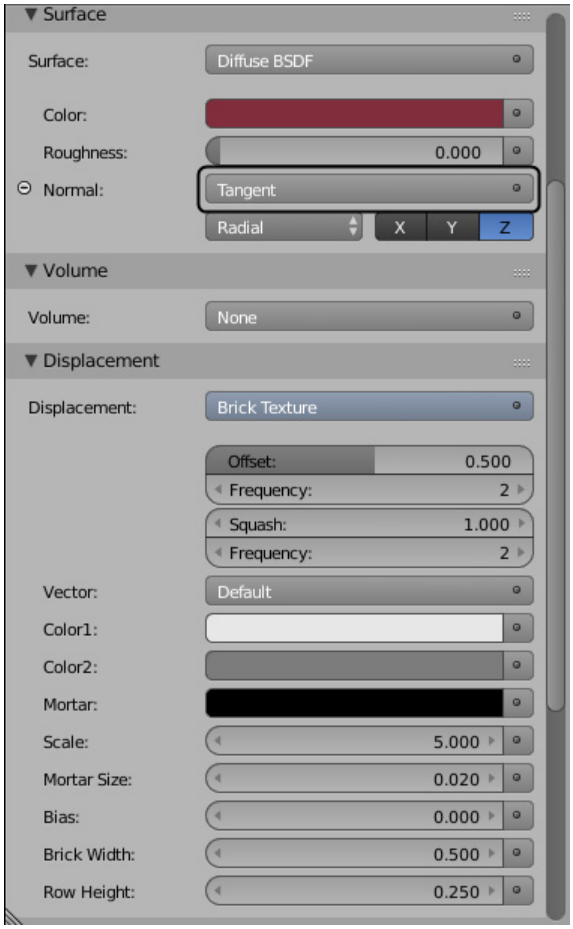

Figure 6-17 *The* ***Diffuse BSDF*** *and* ***Brick Texture*** *shaders and their parameters in* ***Properties Editor***

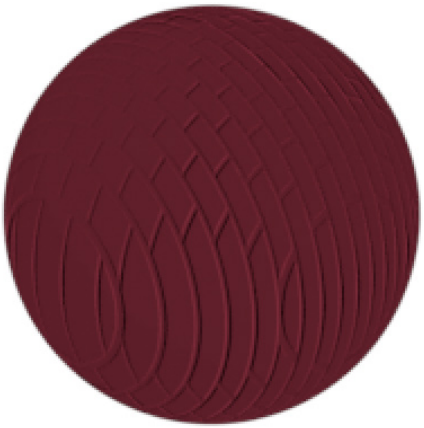

Figure 6-18 *The rendered image*

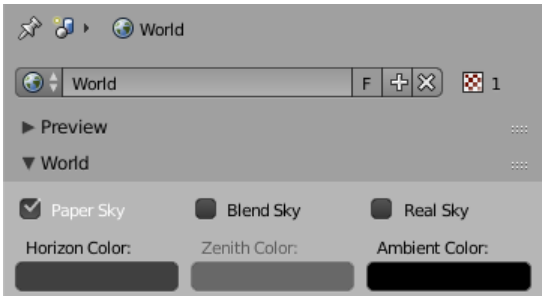

Figure 6-19 *The* ***Paper Sky*** *check box in the* ***World*** *panel*

Figure 6-20 *The* ***Horizon*** *check box in the* ***Influence*** *panel*

Figure 6-21 *Rendered image of a scene*

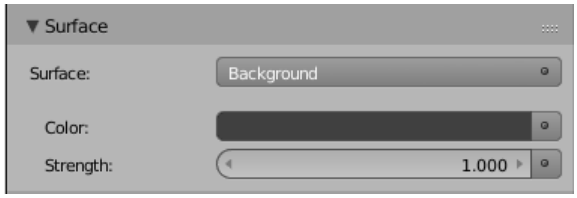

Figure 6-22 *The* ***Surface*** *panel modified*

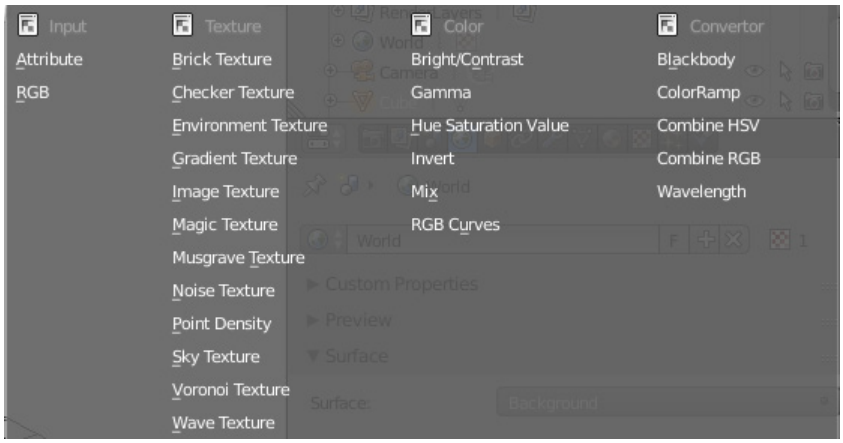

Figure 6-23 *The flyout displayed*

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Figure 6-24 *Rendered image of the scene*

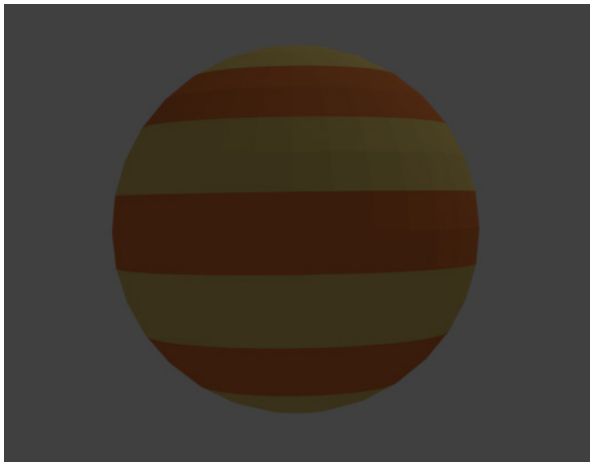

Figure 6-25 *The UV Sphere with two materials applied*

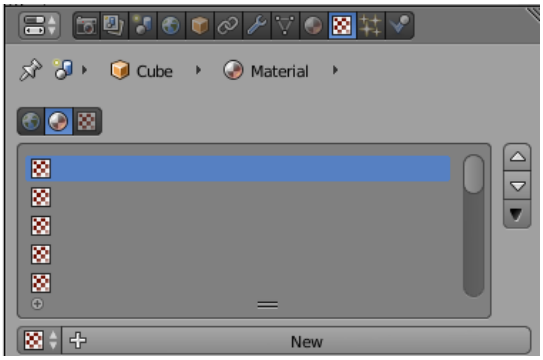

Figure 6-26 *Modified* ***Properties Editor***

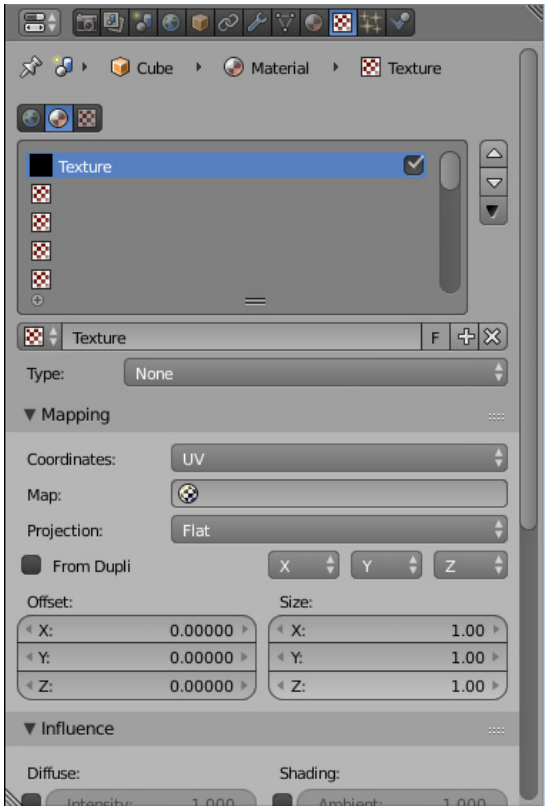

Figure 6-27 *Various panels and the* ***Type*** *drop-down in* ***Properties Editor***

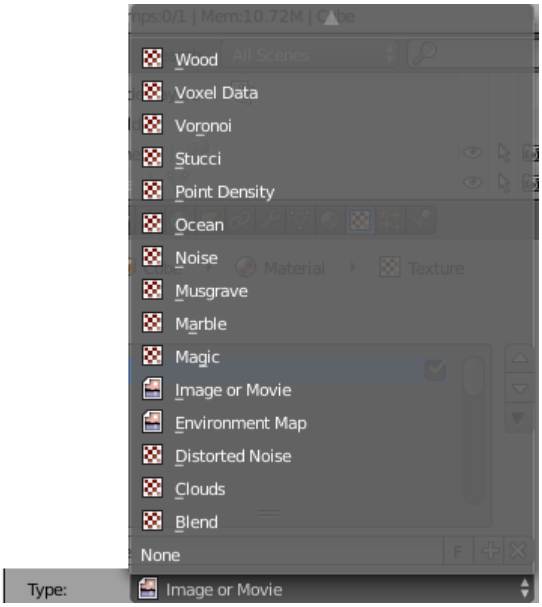

Figure 6-28 *The* ***Type*** *drop-down*

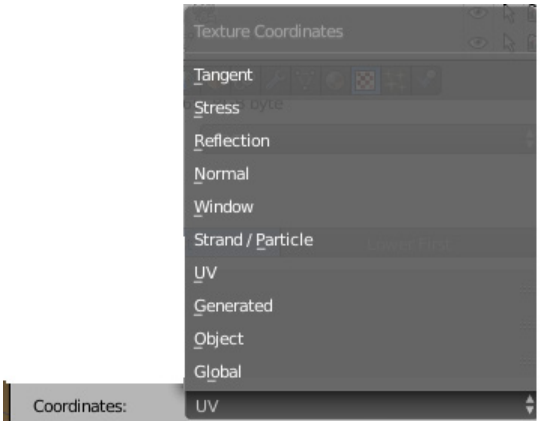

Figure 6-29 The **Coordinates** drop-down

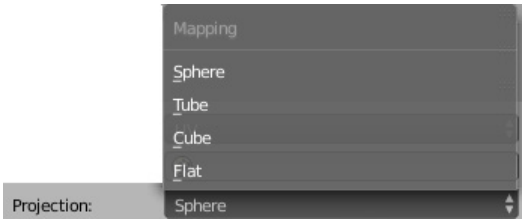

Figure 6-30 The **Projection** drop-down

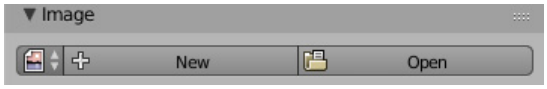

Figure 6-31 The **Image** panel

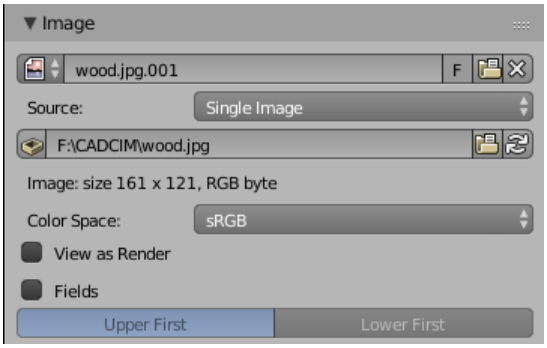

Figure 6-32 Modified **Image** panel

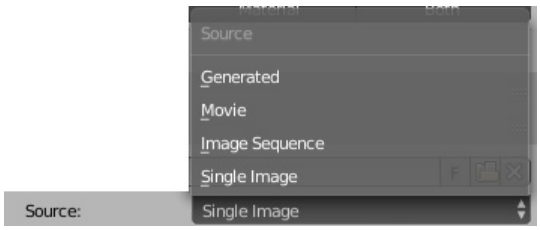

Figure 6-33 The **Source** drop-down

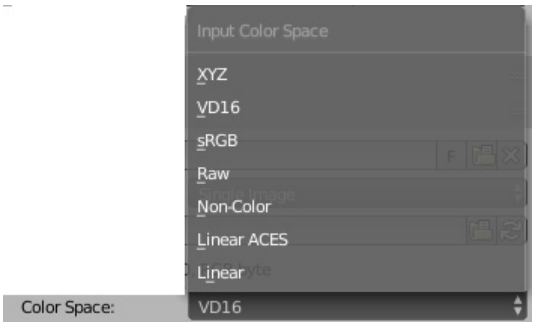

Figure 6-34 The **Color Space** drop-down

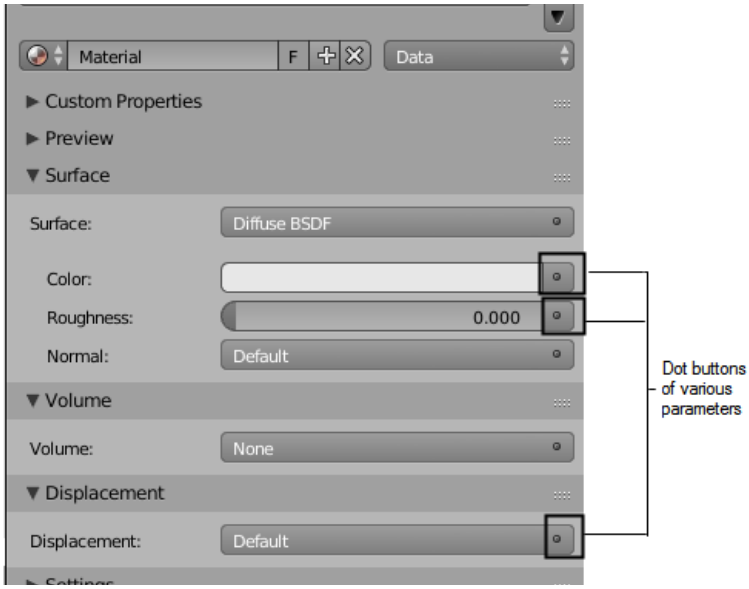

Figure 6-35 *Dot buttons in various panels*

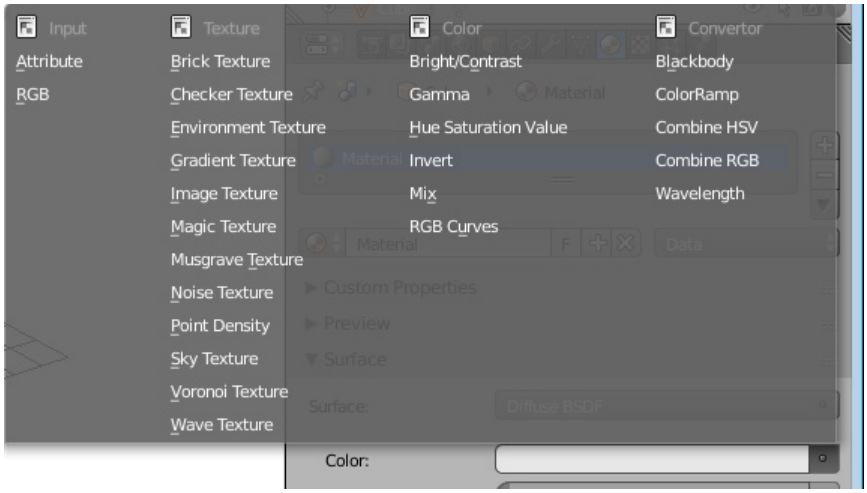

Figure 6-36 *The flyout displayed*

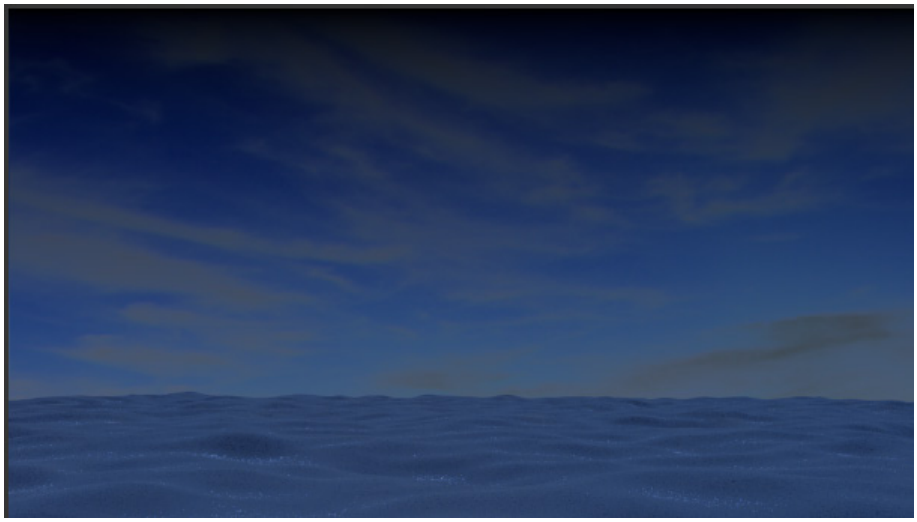

Figure 6-37 *The Water surface*

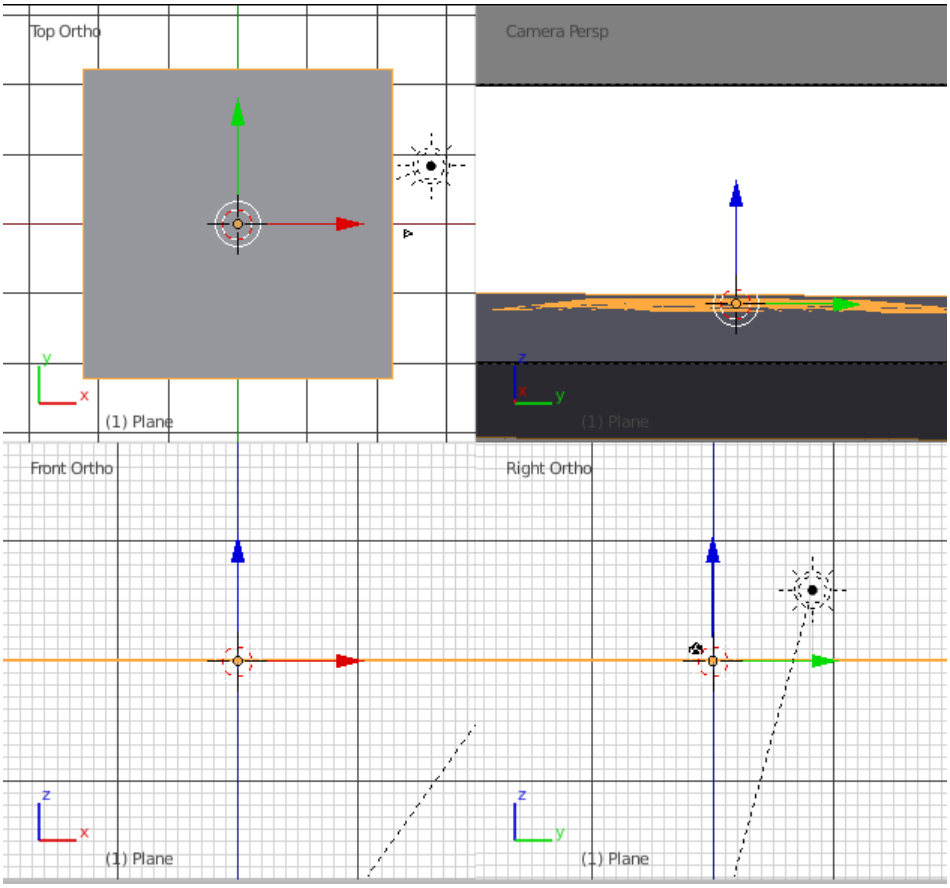

Figure 6-38 *The c06_tut1_start file*

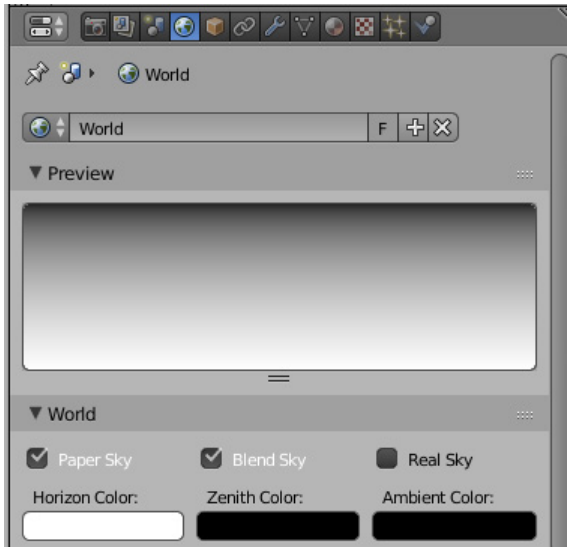

Figure 6-39 *Selected check boxes in the* ***World*** *panel*

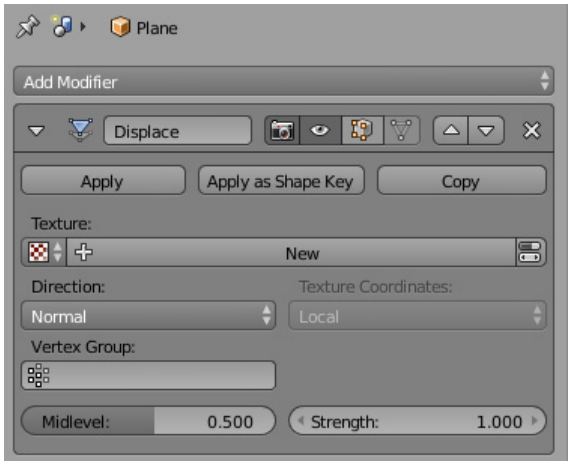

Figure 6-40 *The parameters of the* ***Displace*** *modifier*

Figure 6-41 *Hanging lamp with material*

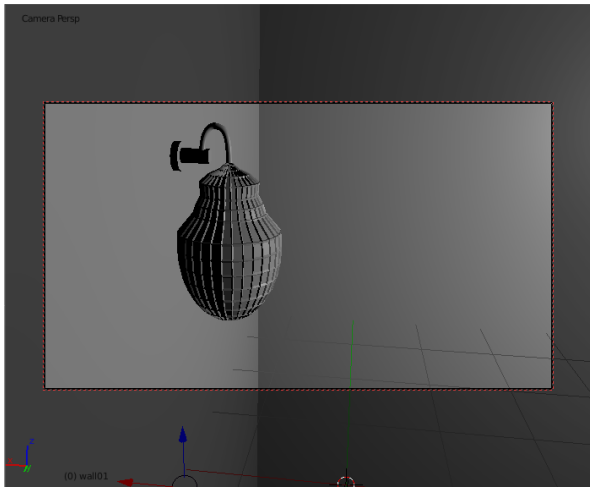

Figure 6-42 *The* ***c06_tut1_start file***

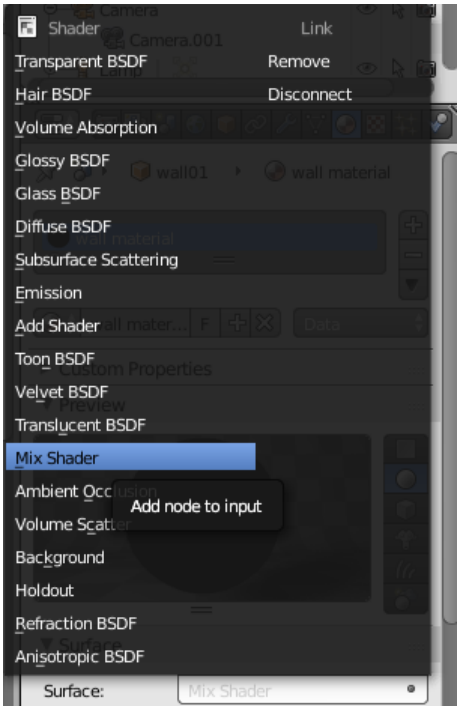

Figure 6-43 *Choosing* ***Mix Shader*** *from the* ***Surface*** *drop-down*

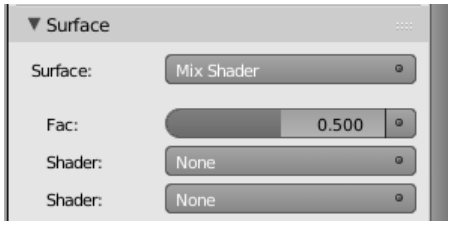

Figure 6-44 *The modified* ***Surface*** *panel*

Figure 6-45 *The rendered image*

Figure 6-46 *The rendered image*

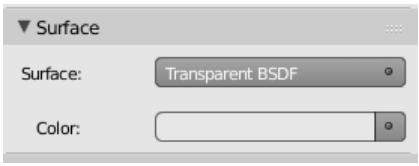

Figure 6-47 *The* ***Surface*** *panel for the* ***Transparent BSDF*** *shader*

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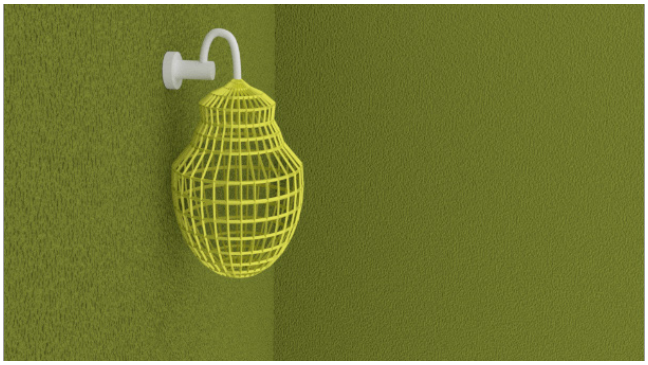

Figure 6-48 *The rendered image*

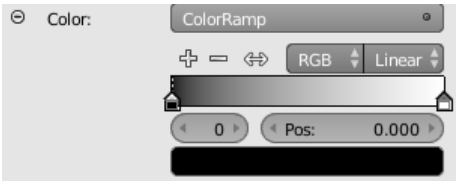

Figure 6-49 *Parameters related to* ***Color Ramp***

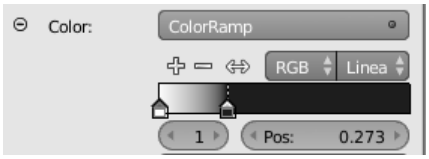

Figure 6-50 *Position of second color stop changed*

Figure 6-51 *The model of a tea cup with copper material and a floor with a texture*

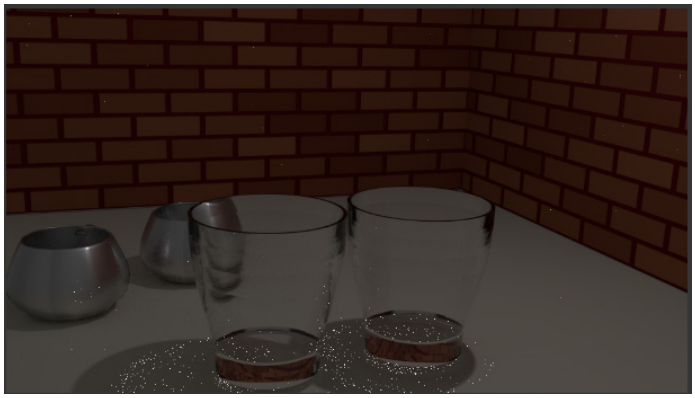

Figure 6-52 *Scene with materials and textures applied*

Chapter 7

Working with Materials - II

Learning Objectives

After completing this chapter, you will be able to:

- *Use Node Editor to create various materials*
- *Use Node Editor to apply various textures*
- *Use the Vertex Paint mode*
- *Understand UV unwrapping techniques*
- *Use the Texture Paint mode*

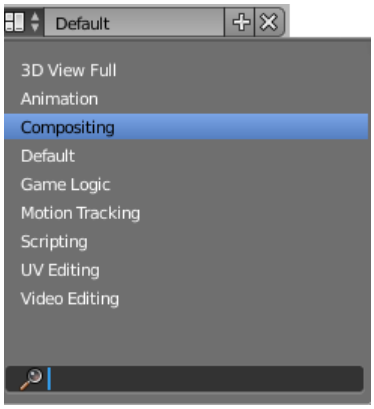

Figure 7-1 *Choosing* ***Compositing*** *from the* ***Screen Layout*** *drop-down*

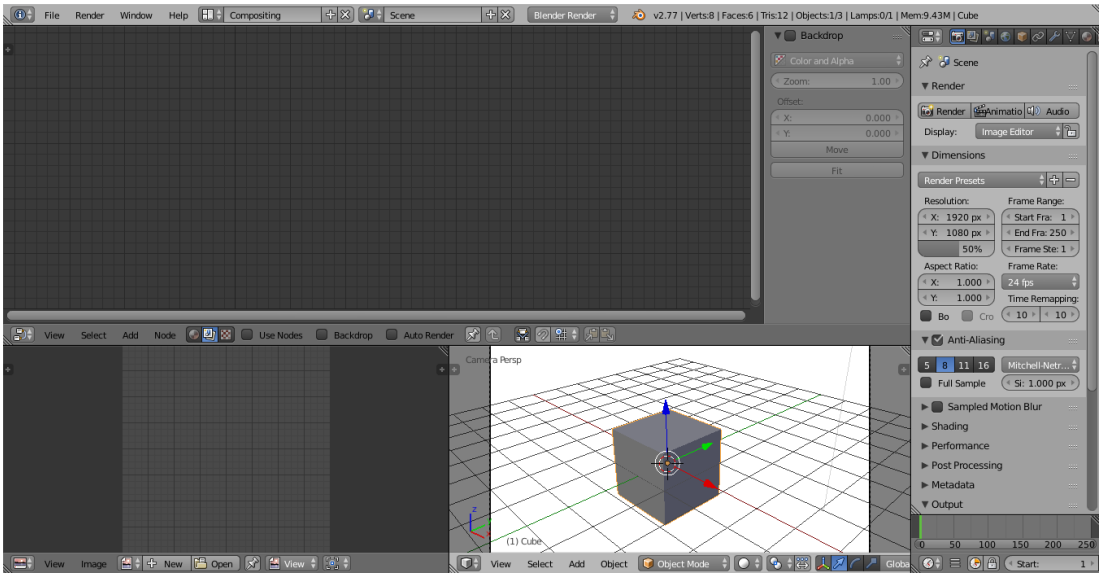

Figure 7-2 *The Compositing layout*

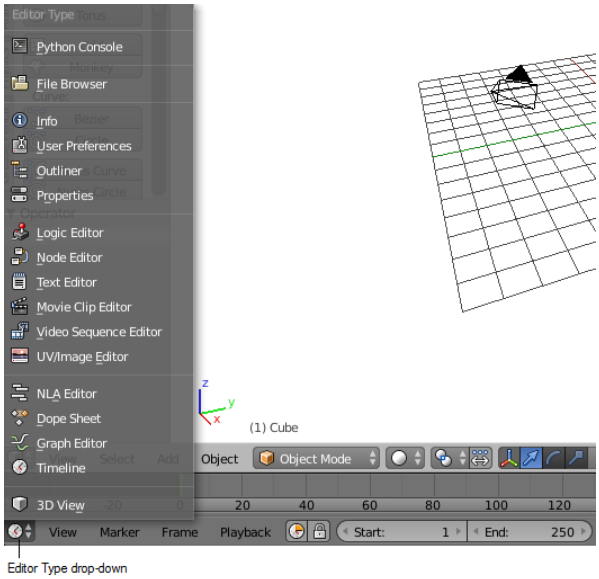

Figure 7-3 *The* ***Editor Type*** *drop-down*

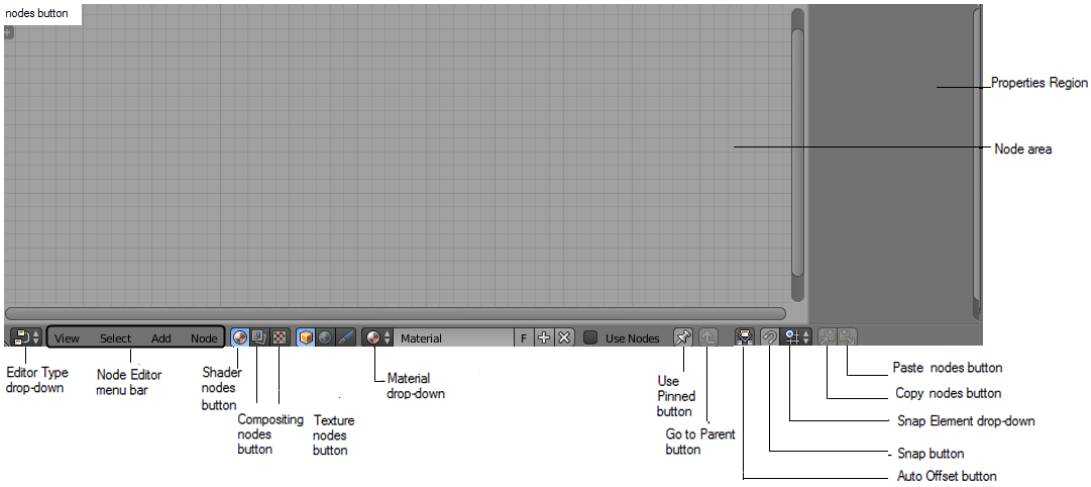

Figure 7-4 *Components of* ***Node Editor***

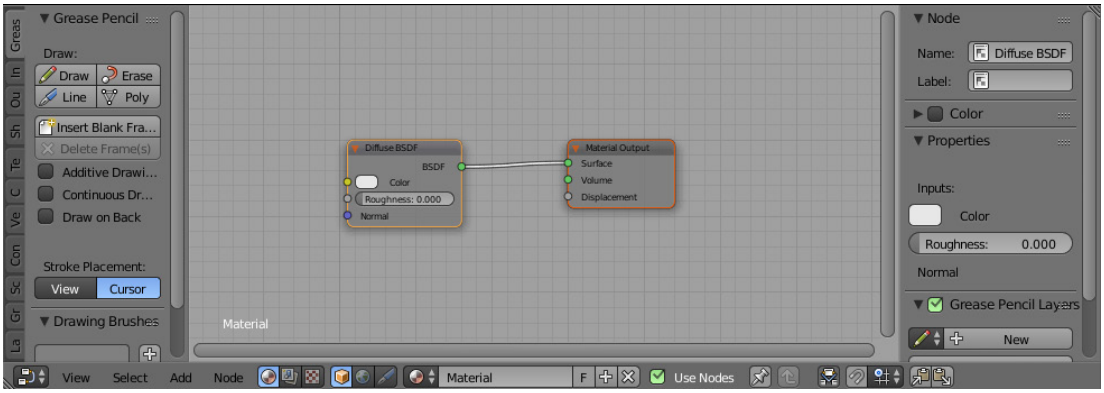

Figure 7-5 *The* ***Material*** *and* ***Output*** *nodes added to* ***Node Editor*** *with the* ***Material*** *node selected*

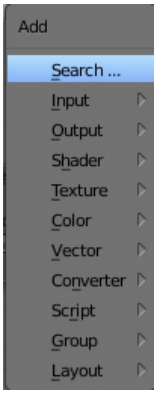

Figure 7-6 *The* ***Add*** *menu*

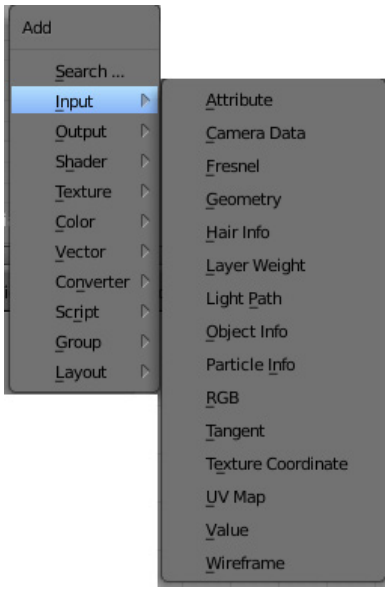

Figure 7-7 *The cascading menu*

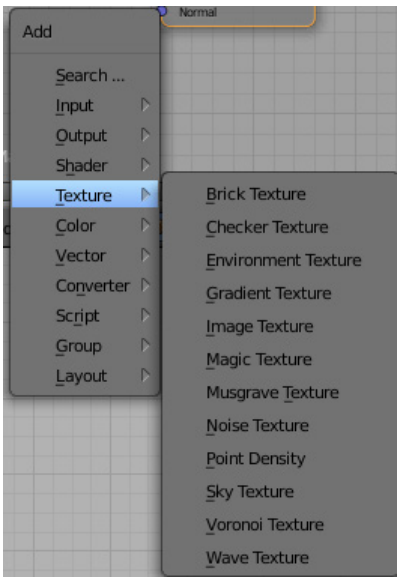

Figure 7-8 *The cascading menu*

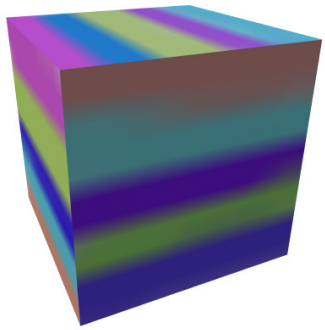

Figure 7-9 *The multicolored cube*

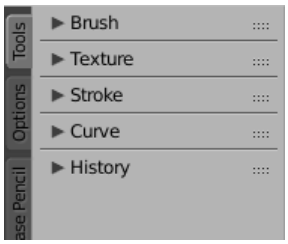

Figure 7-10 *The panels in the* ***Tools*** *tab*

Figure 7-11 *The panels in the* ***Options*** *tab*

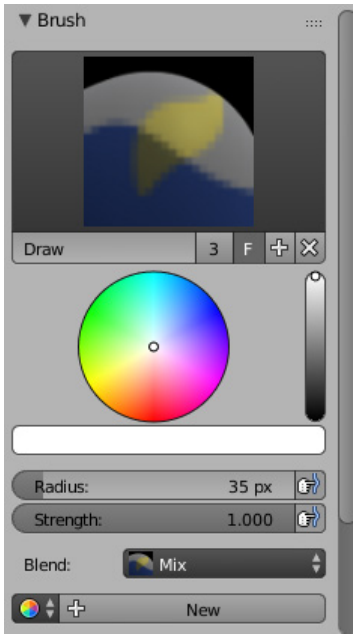

Figure 7-12 *The options in the* ***Brush*** *panel*

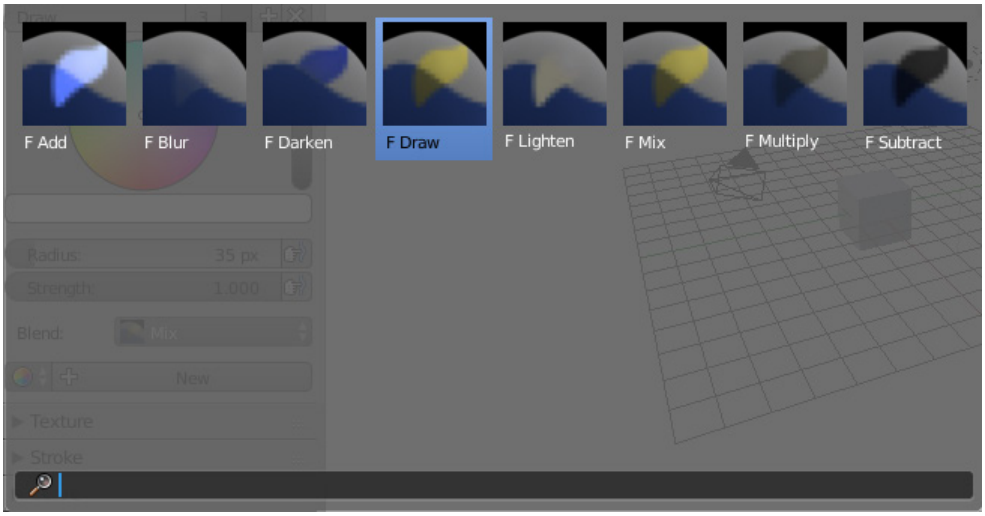

Figure 7-13 *The flyout displayed*

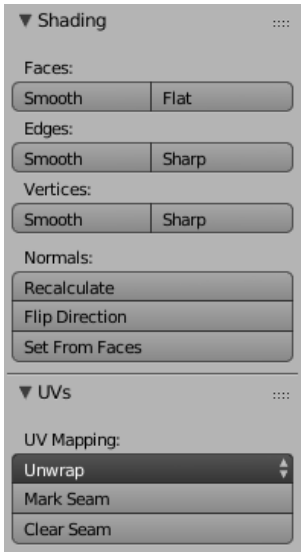

Figure 7-14 *The* ***Shading*** *and* ***UVs*** *panel in* ***Toolshelf***

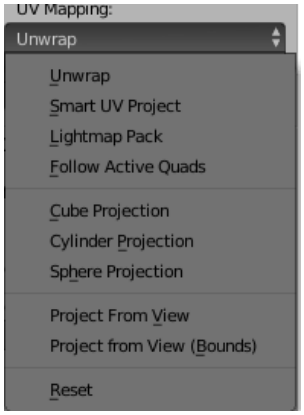

Figure 7-15 *Options in the* ***UV Mapping*** *drop-down*

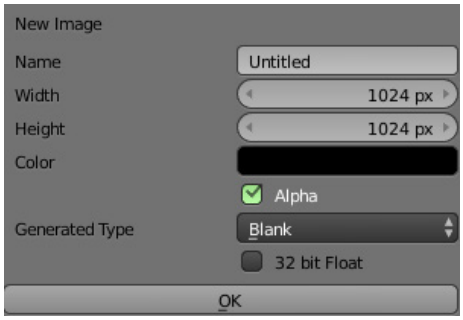

Figure 7-16 *The* ***New Image*** *window*

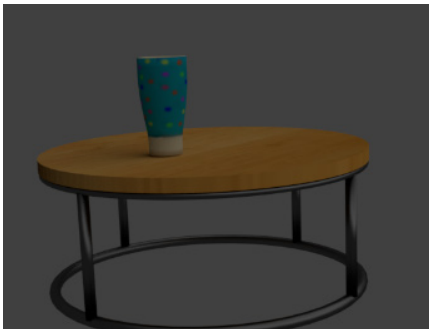

Figure 7-17 *Textured center table and glass*

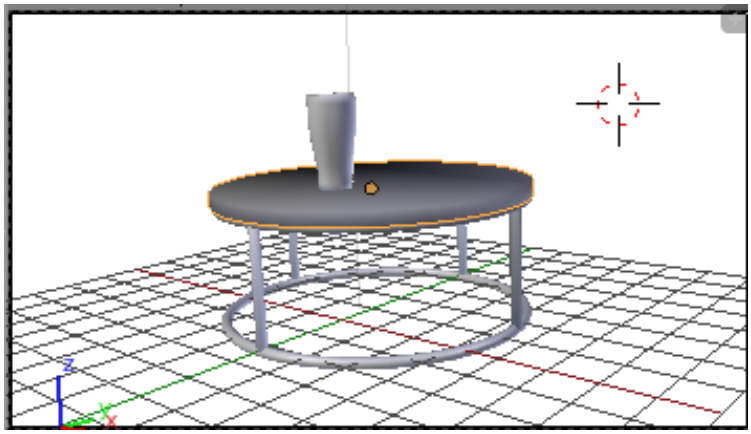

Figure 7-18 *The c07_tut1_start file*

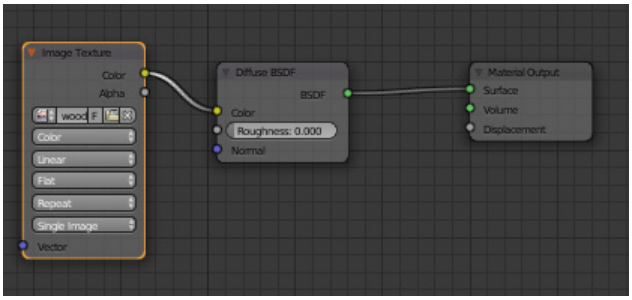

Figure 7-19 *Connected* ***Image Texture*** *node and* ***Diffuse BSDF*** *node displayed*

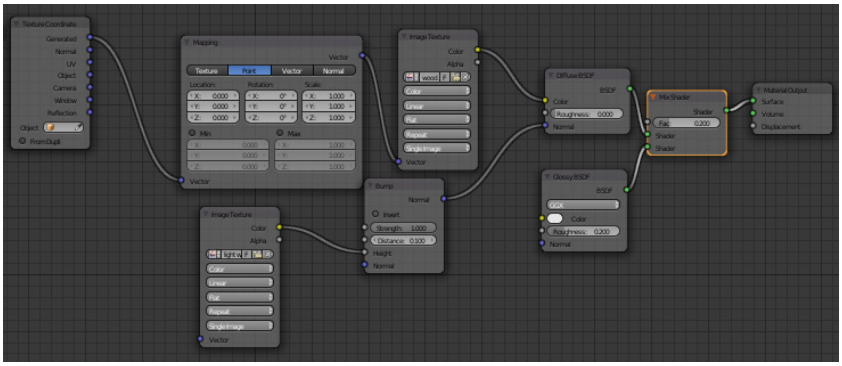

Figure 7-20 *Node flow for the wood material*

Figure 7-21 *The rendered image*

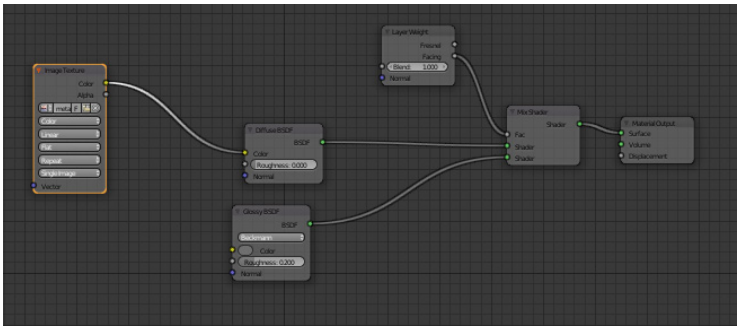

Figure 7-22 *Node flow for metal material*

Figure 7-23 *The rendered image*

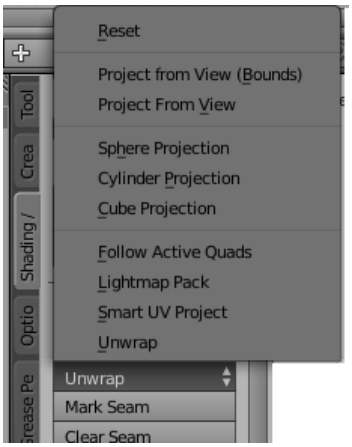

Figure 7-24 *The* ***UV Mapping*** *drop-down*

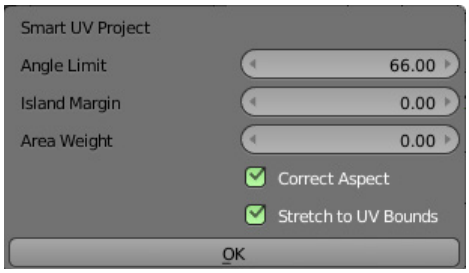

Figure 7-25 *The* ***Smart UV Project*** *window*

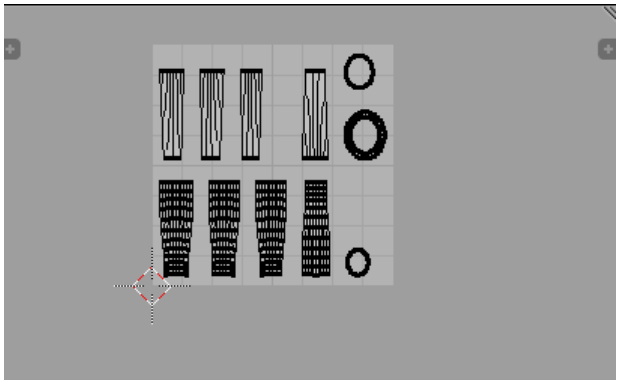

Figure 7-26 *UVs of glass*

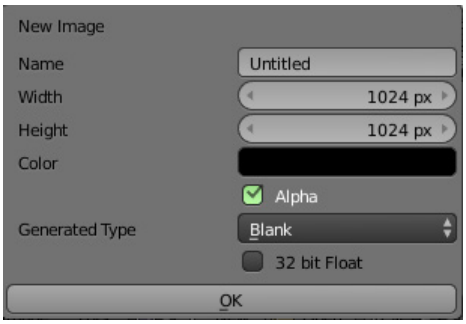

Figure 7-27 *The* ***New Image*** *window*

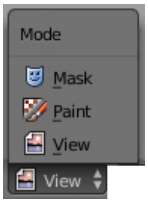

Figure 7-28 *The* ***Mode*** *drop-down*

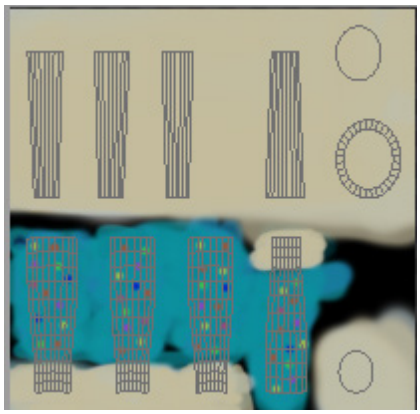

Figure 7-29 *Painted UVs of glass*

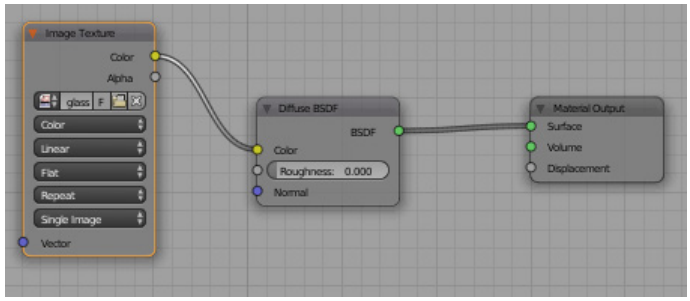

Figure 7-30 *Connected* ***Image Texture*** *node and* ***Diffuse BSDF*** *node*

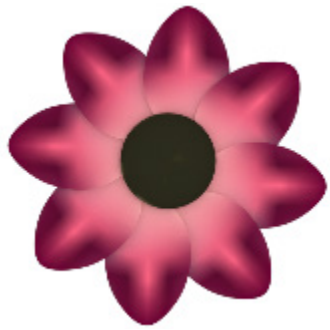

Figure 7-31 *Textured flower using vertex paint*

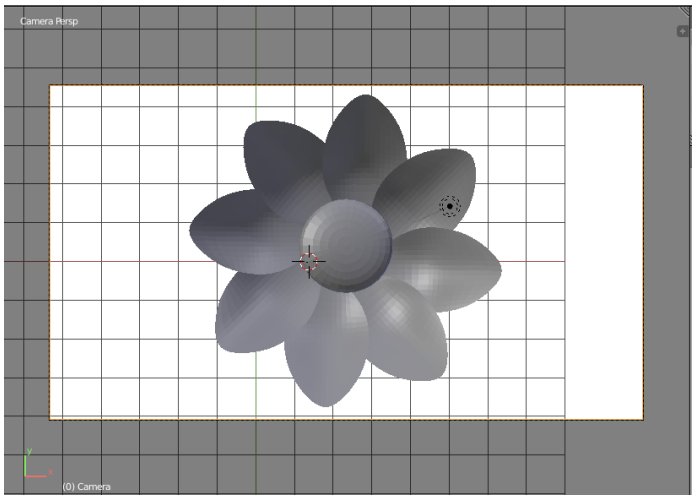

Figure 7-32 *The c07_tut2_start file dispalyed*

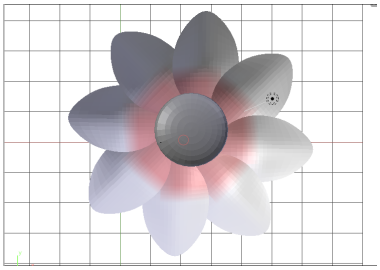

Figure 7-33 *Strokes applied on petal*

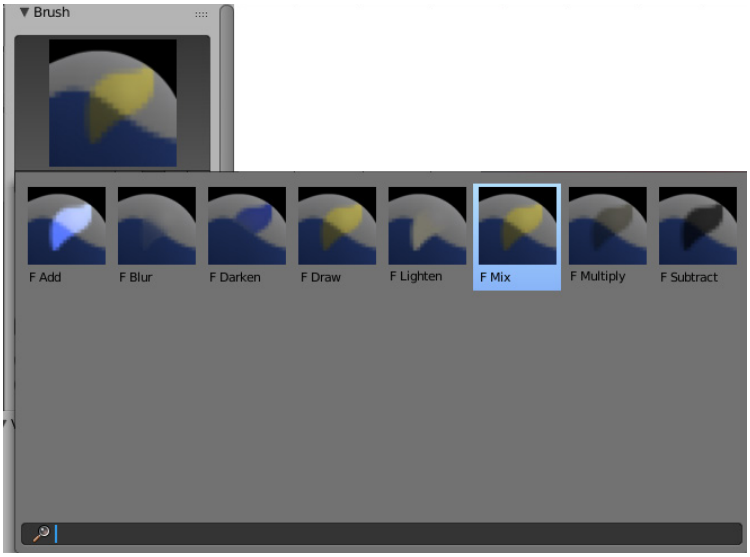

Figure 7-34 *Choosing* ***F Mix*** *from the flyout*

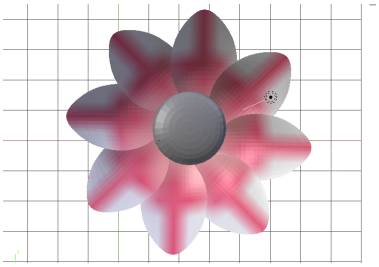

Figure 7-35 *Strokes applied on petal*

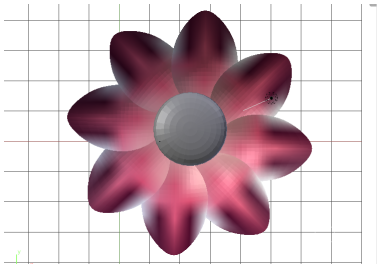

Figure 7-36 *Strokes applied on petal*

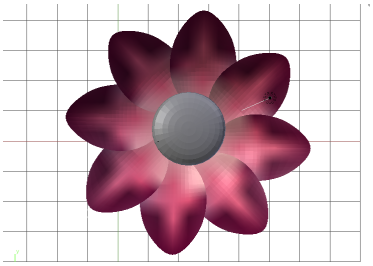

Figure 7-37 *Strokes applied on petal*

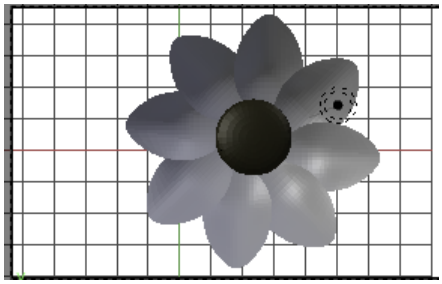

Figure 7-38 *Strokes applied on ovary*

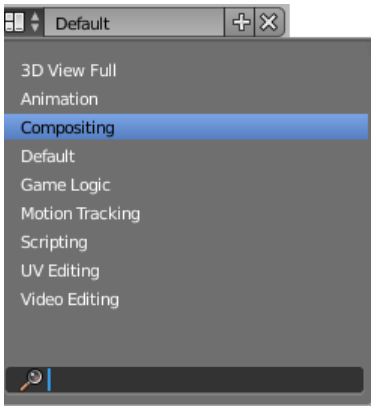

Figure 7-39 *Choosing* ***Compositing*** *from the* ***Screen Layout*** *drop-down*

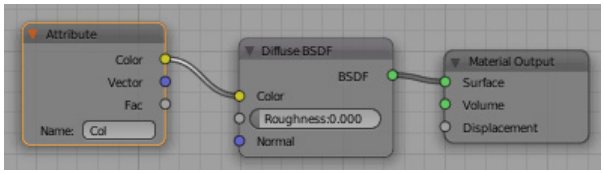

Figure 7-40 *Attribute node added to Node area*

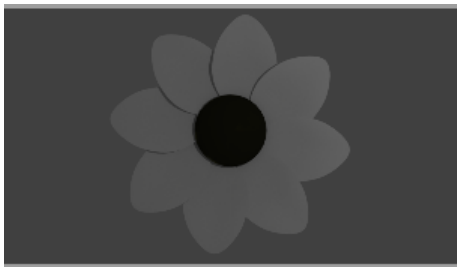

Figure 7-41 *Vertex paint on ovary visible in the rendered image*

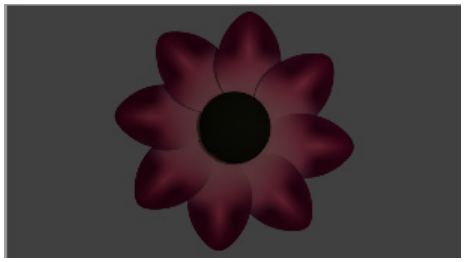

Figure 7-42 *Vertex paint on petal visible in the rendered image*

Figure 7-43 *The model of a sofa set with velvet material and a floor with a texture*

Figure 7-44 *Textured bowl*

Chapter 8

Lights and Cameras

Learning Objectives

After completing this chapter, you will be able to:

- *Understand various types of lamps*
- *Understand mesh lighting*
- *Understand light portals*
- *Understand camera*
- *Constrain a camera to an object*

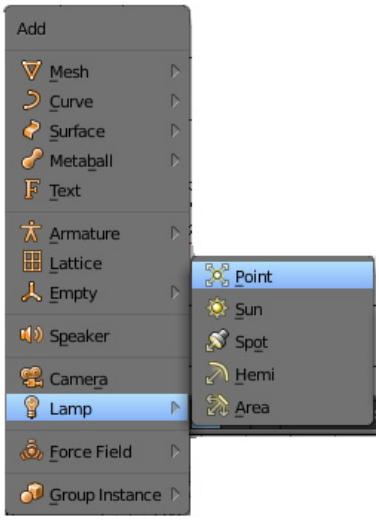

Figure 8-1 *Choosing* ***Point*** *from the* ***Add*** *menu*

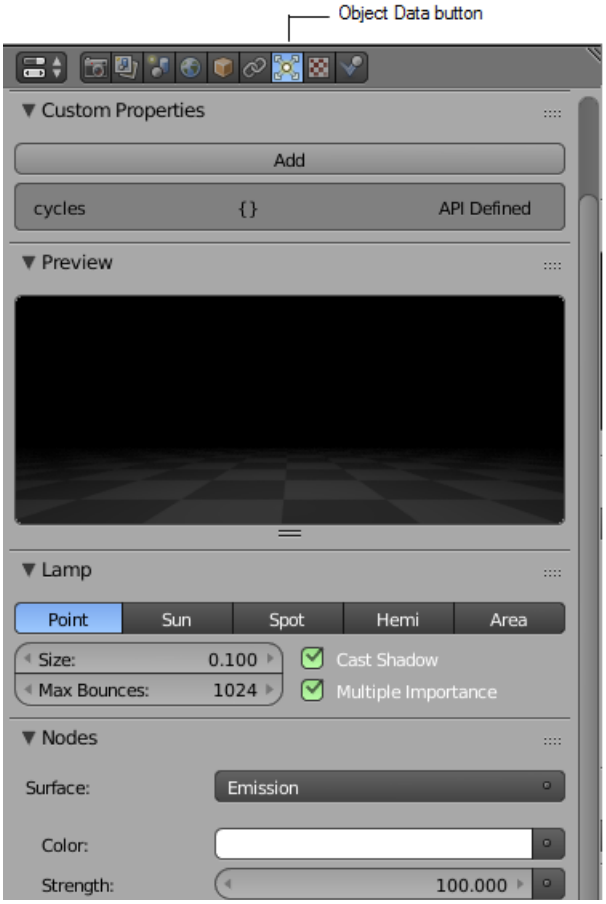

Figure 8-2 *Various panels in* ***Properties Editor***

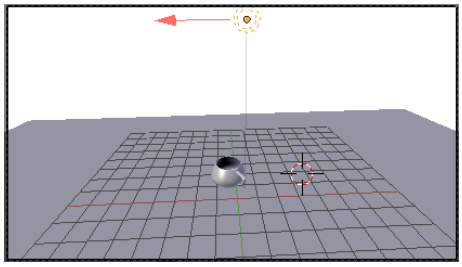

Figure 8-3 *Point lamp placed in the scene*

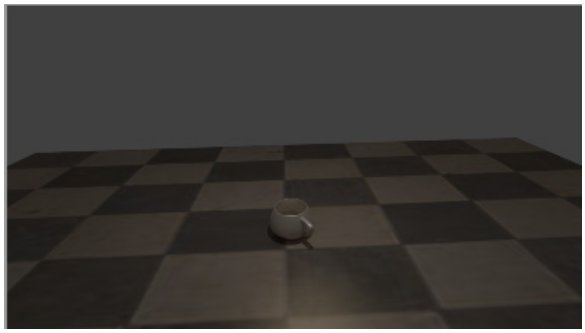

Figure 8-4 *The Rendered image*

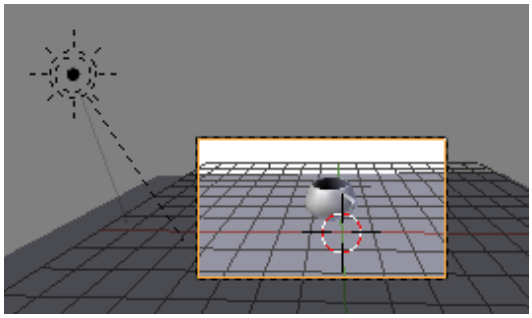

Figure 8-5 *Sun lamp placed in the scene*

Figure 8-6 *The rendered image*

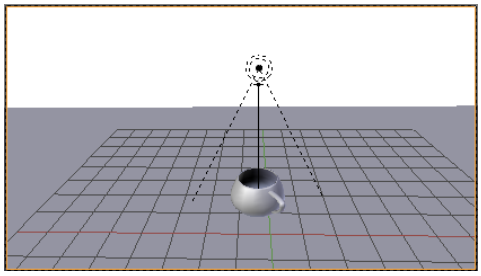

Figure 8-7 *Spot lamp placed in the scene*

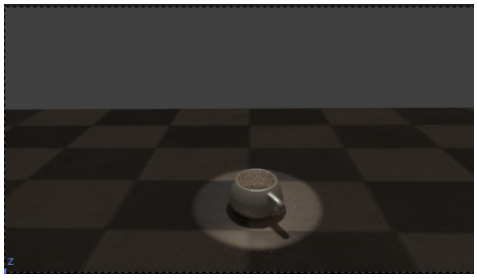

Figure 8-8 *The rendered image*

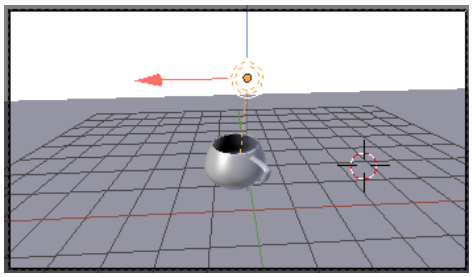

Figure 8-9 *Area lamp placed in the scene*

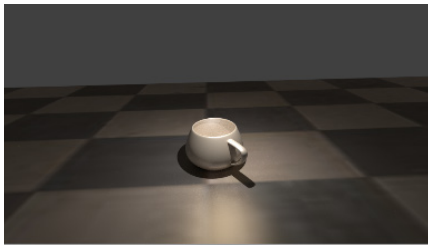

Figure 8-10 *The rendered image*

Figure 8-11 *Scene without light portal*

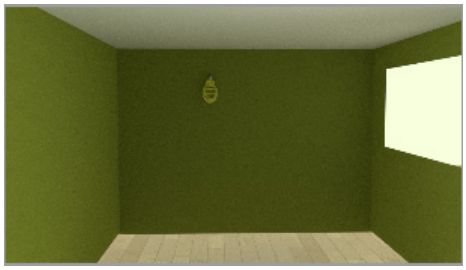

Figure 8-12 *Scene with light portal*

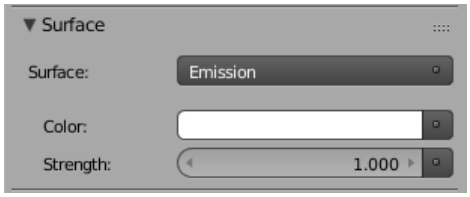

Figure 8-13 *The* ***Emission*** *shader chosen in the* ***Surface*** *drop-down*

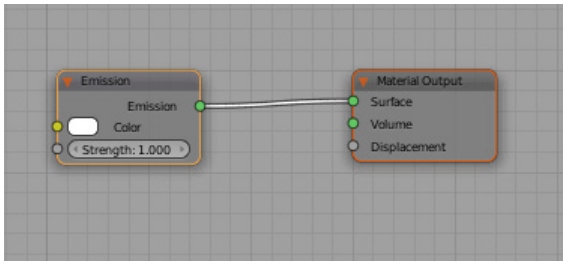

Figure 8-14 *The* ***Emission*** *node connected to the* ***Material Output*** *node*

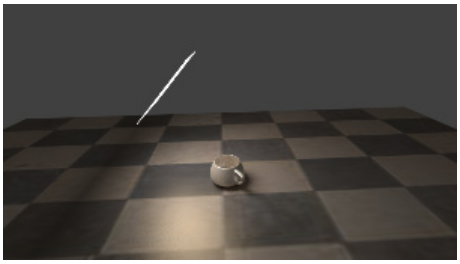

Figure 8-15 *The rendered image of the scene with* ***Strength=10***

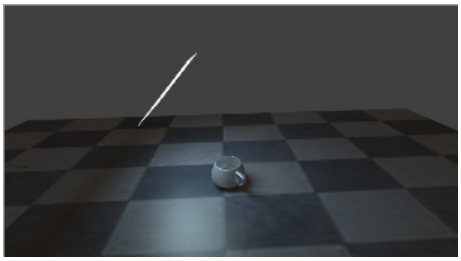

Figure 8-16 *The rendered image of the scene with bluish tint*

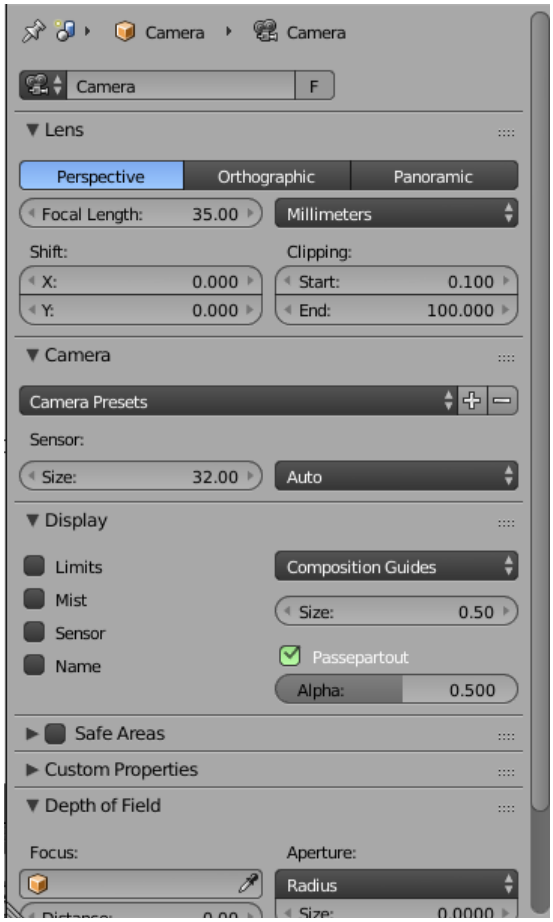

Figure 8-17 *Various panels in* ***Properties Editor*** ·

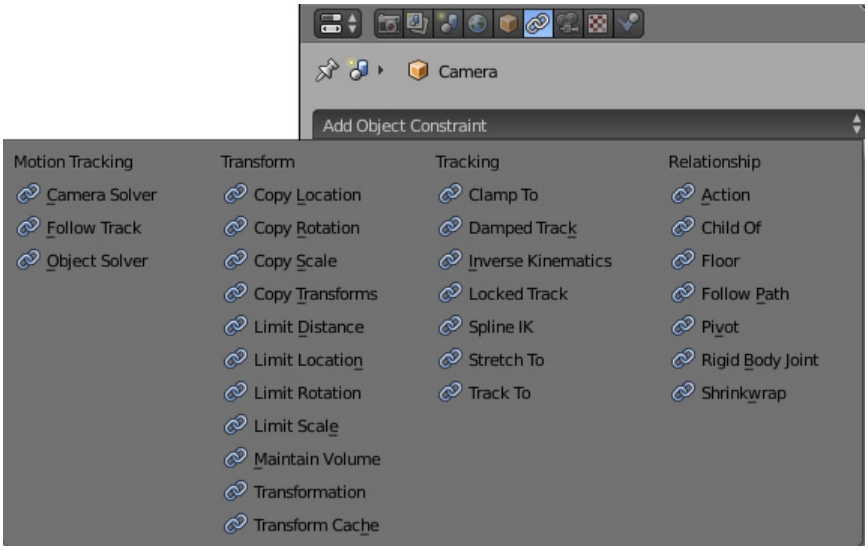

Figure 8-18 *The* ***Add Object Constraint*** *drop-down*

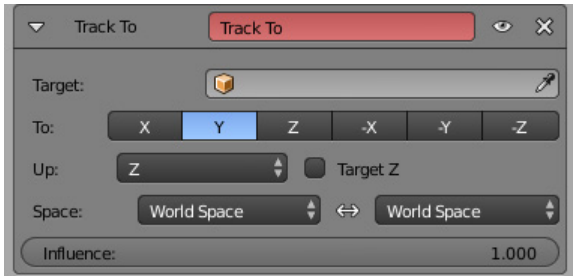

Figure 8-19 *The* ***Track To*** *panel in* ***Properties Editor***

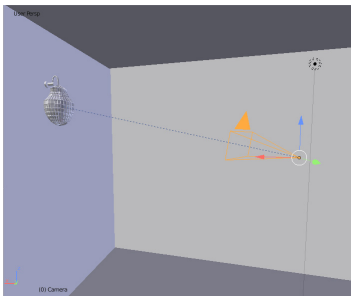

Figure 8-20 *Camera constrained to lamp*

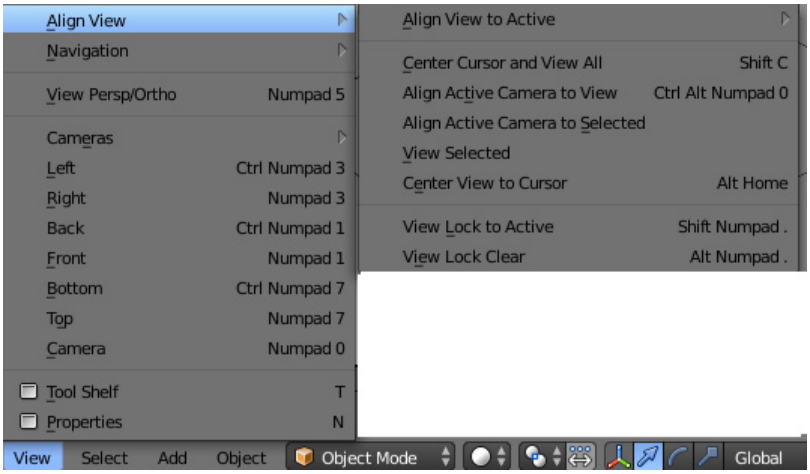

Figure 8-21 *The options in the* ***View*** *menu*

Figure 8-22 *The illuminated interior scene*

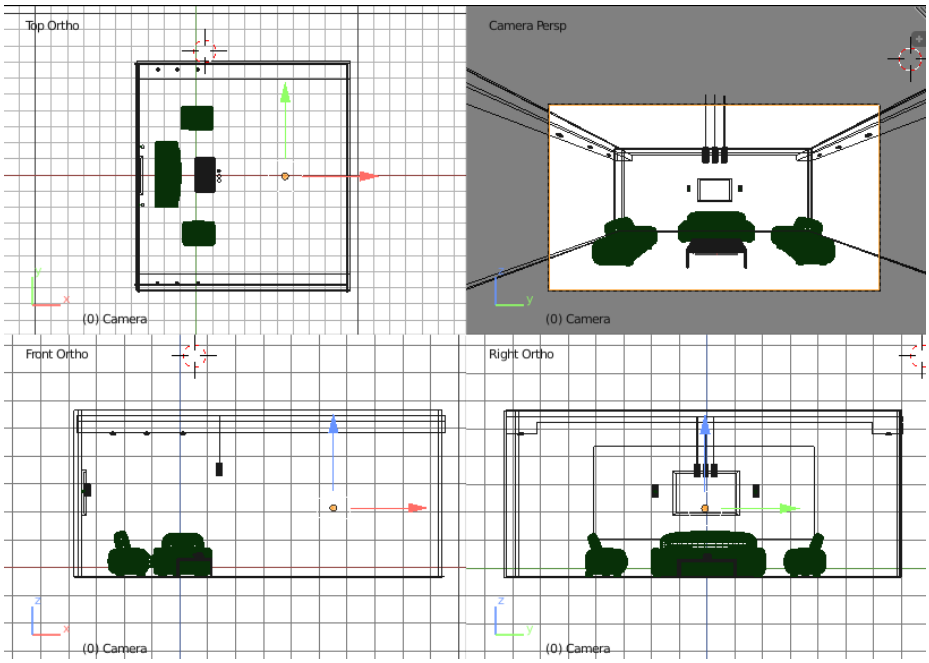

Figure 8-23 *The c08_tut1_start file*

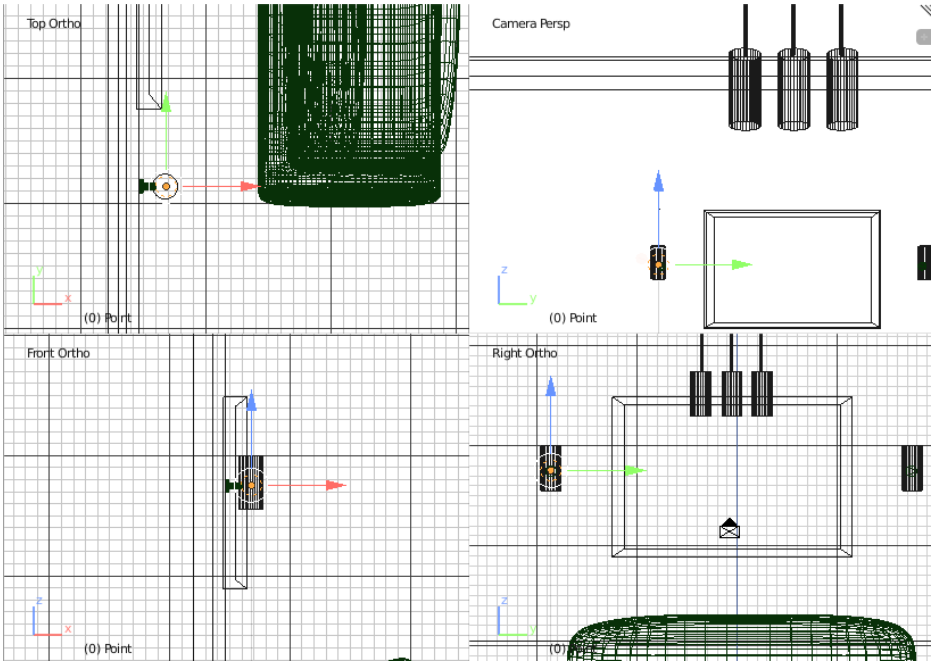

Figure 8-24 *The point lamp aligned*

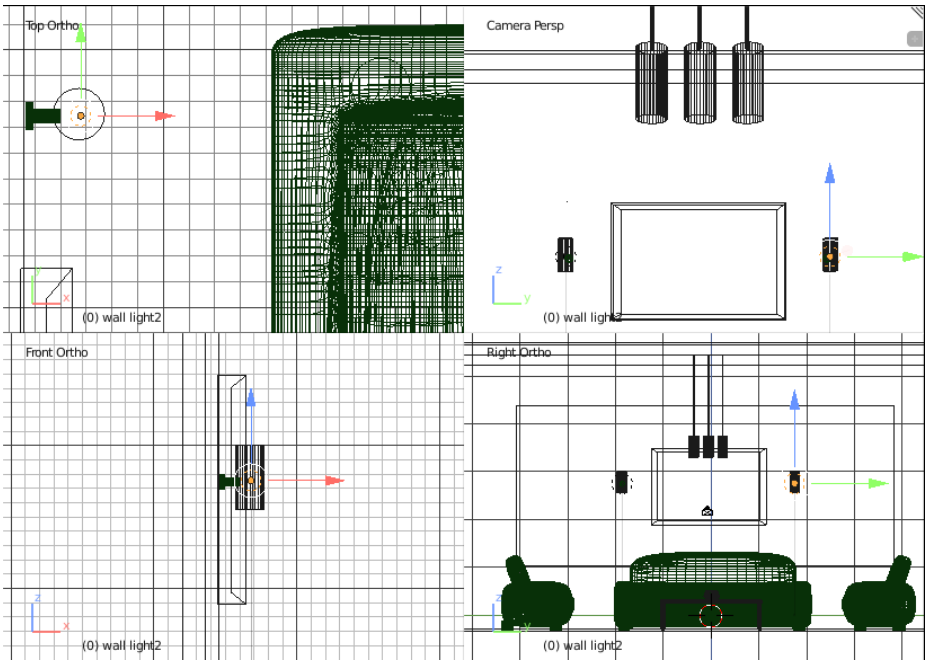

Figure 8-25 *The wall light2 aligned*

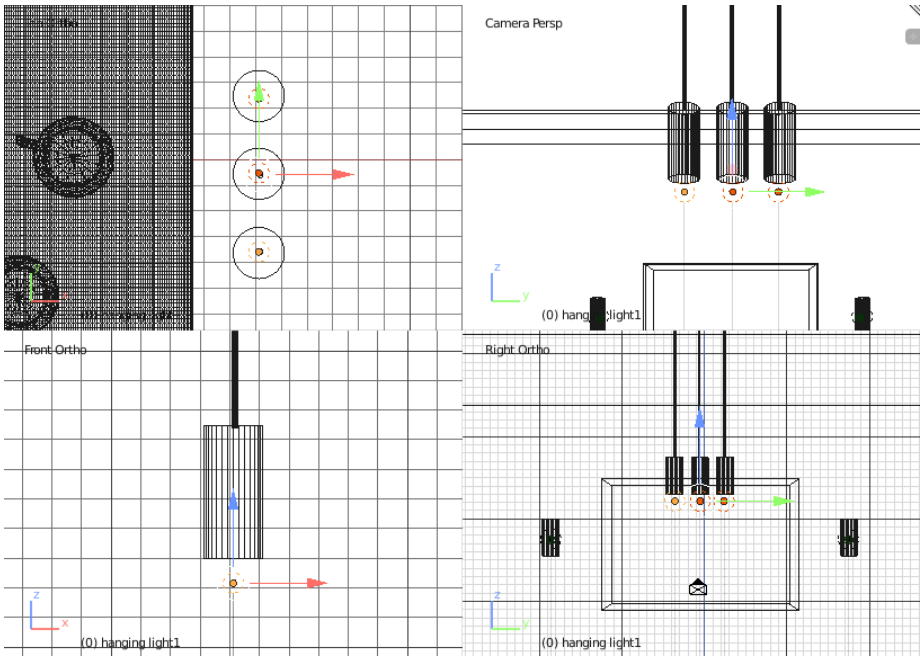

Figure 8-26 *The hanging lights aligned*

Figure 8-27 *The rendered image*

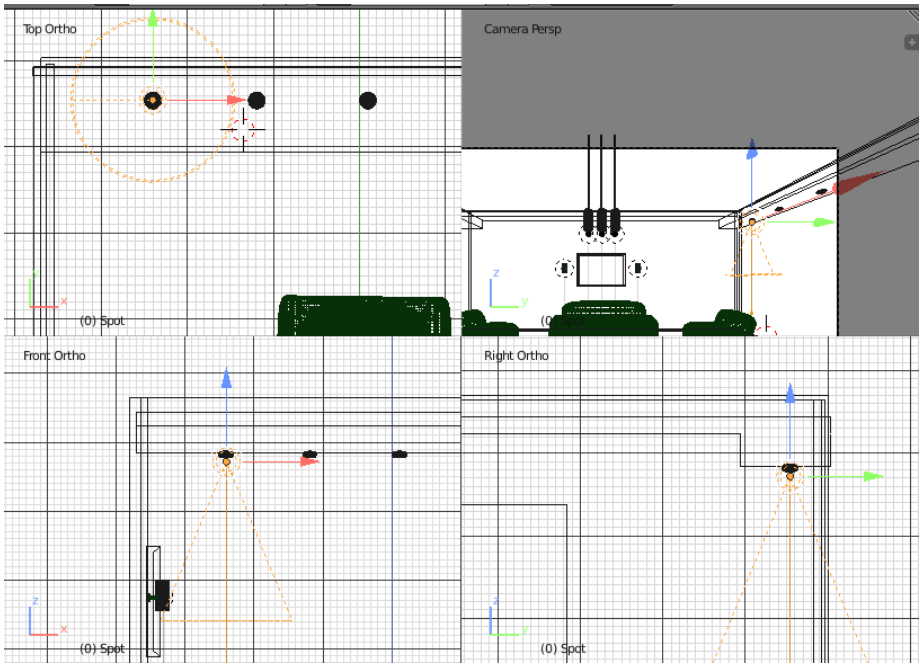

Figure 8-28 *The spot light1 aligned*

Figure 8-29 *The rendered image*

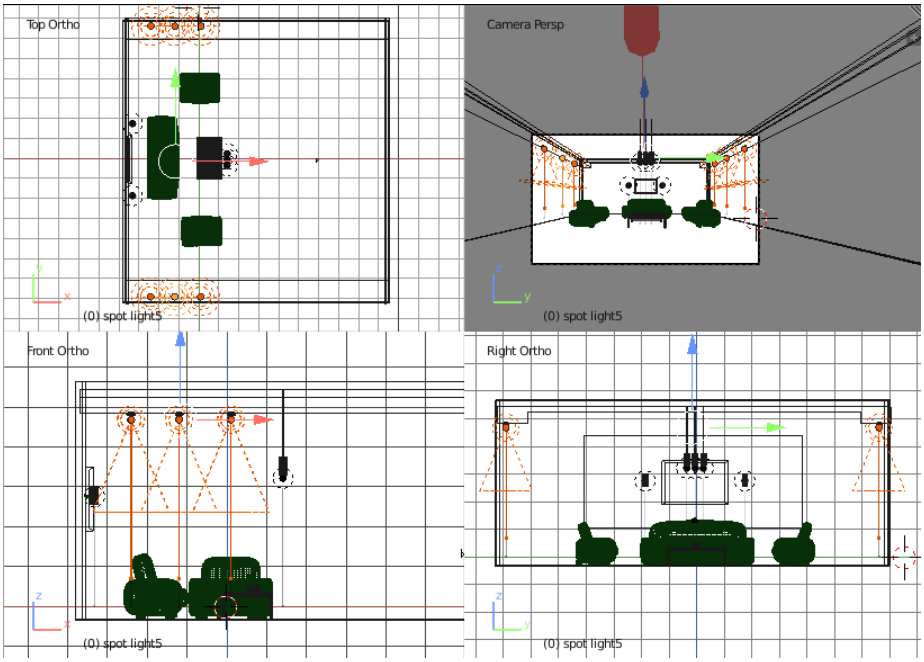

Figure 8-30 *Other spot lights aligned*

Figure 8-31 *The illuminated exterior scene*

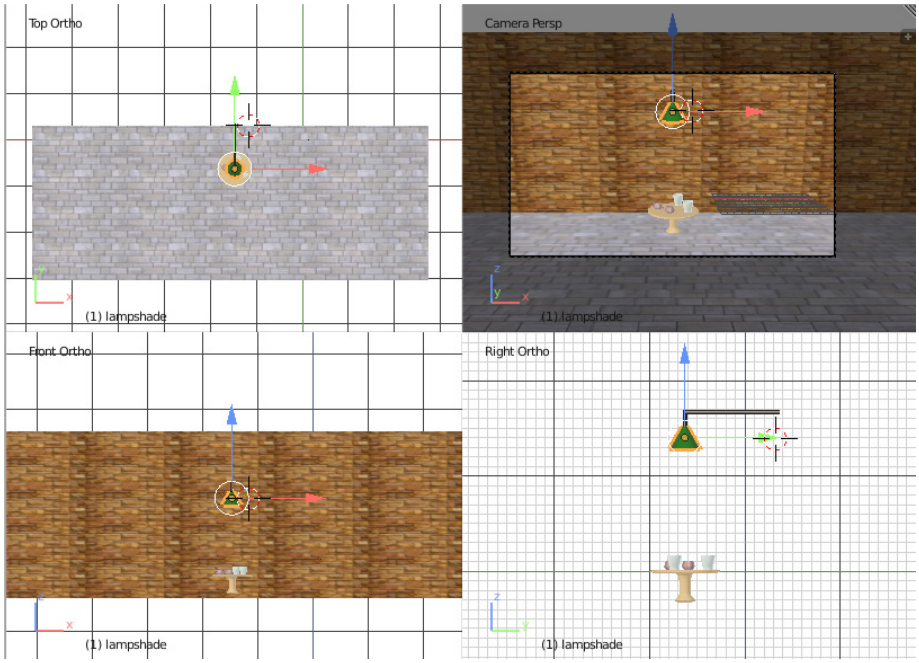

Figure 8-32 *The c08_tut2_start file*

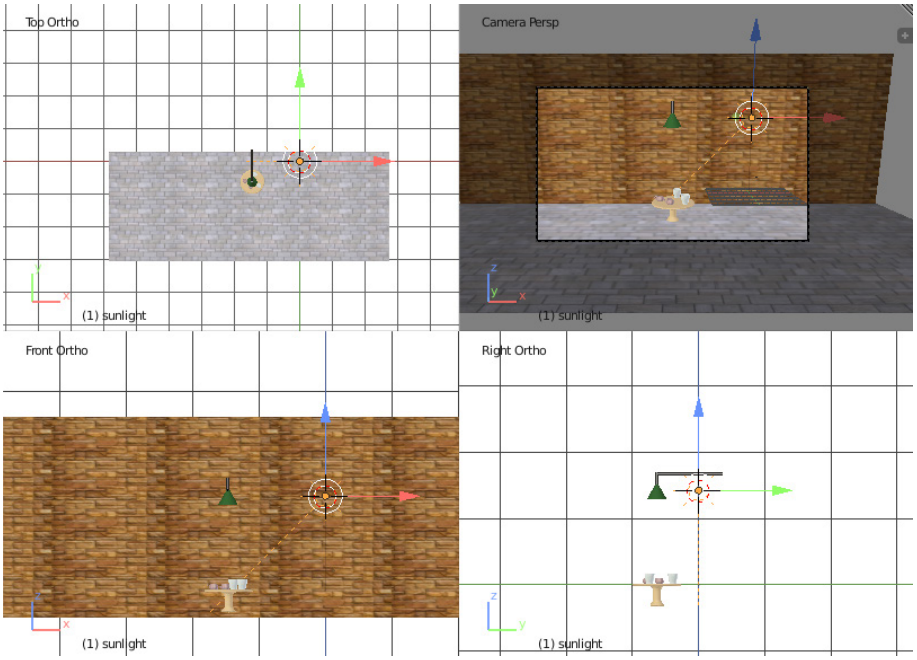

Figure 8-33 *The sunlight rotated*

Figure 8-34 *The rendered image*

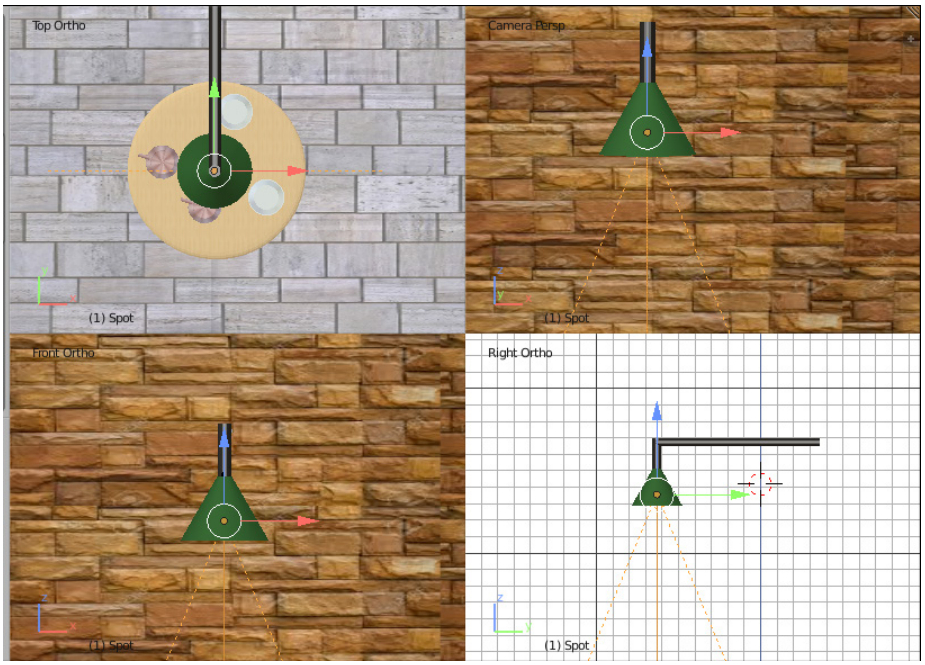

Figure 8-35 *The spot light aligned*

Figure 8-36 *The scene illuminated with spot lights*

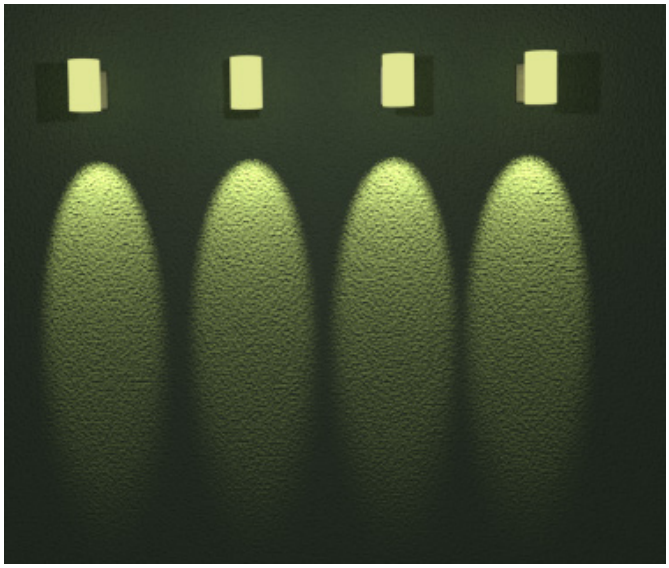

Figure 8-37 *Wall illuminated by spot lamps*

Chapter 9

Basics of Rigging and Animation

Learning Objectives

After completing this chapter, you will be able to:

- *Understand the concept of rigging*
- *Apply constraints*
- *Work with Timeline, Dope Sheet, and Graph Editor*
- *Create path animation*

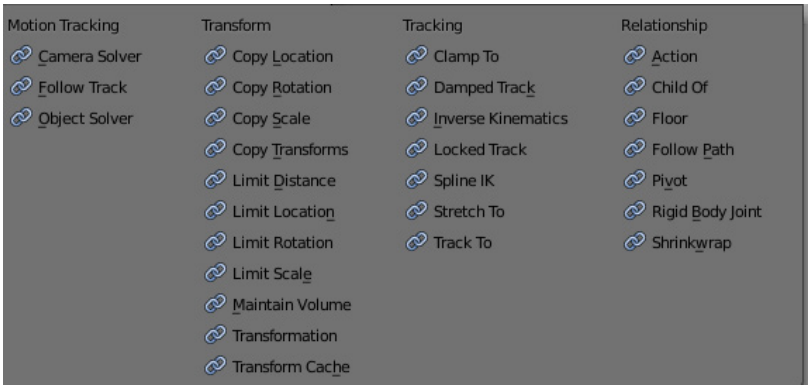

Figure 9-1 *The* ***Add Object Constraint*** *drop-down*

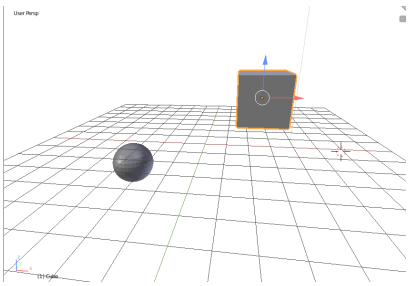

Figure 9-2 *The cube and sphere*

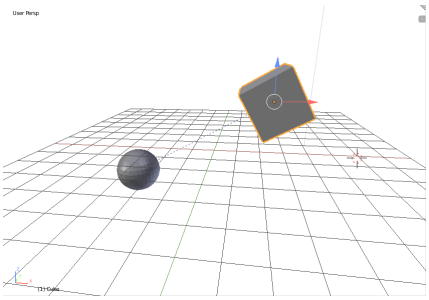

Figure 9-3 *The cube with the* ***Track to*** *constraint applied*

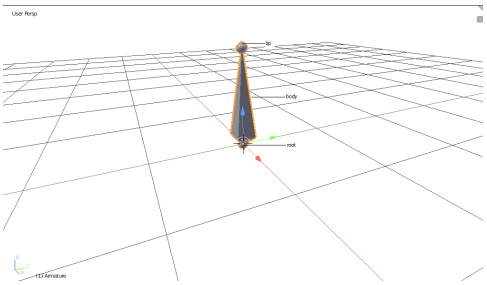

Figure 9-4 *The parts of armature*

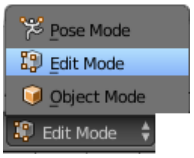

Figure 9-5 *The* ***Mode*** *drop-down*

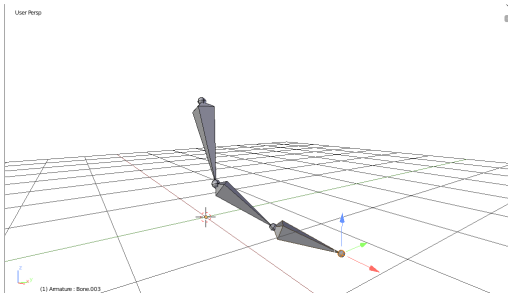

Figure 9-6 *Bones added to armature*

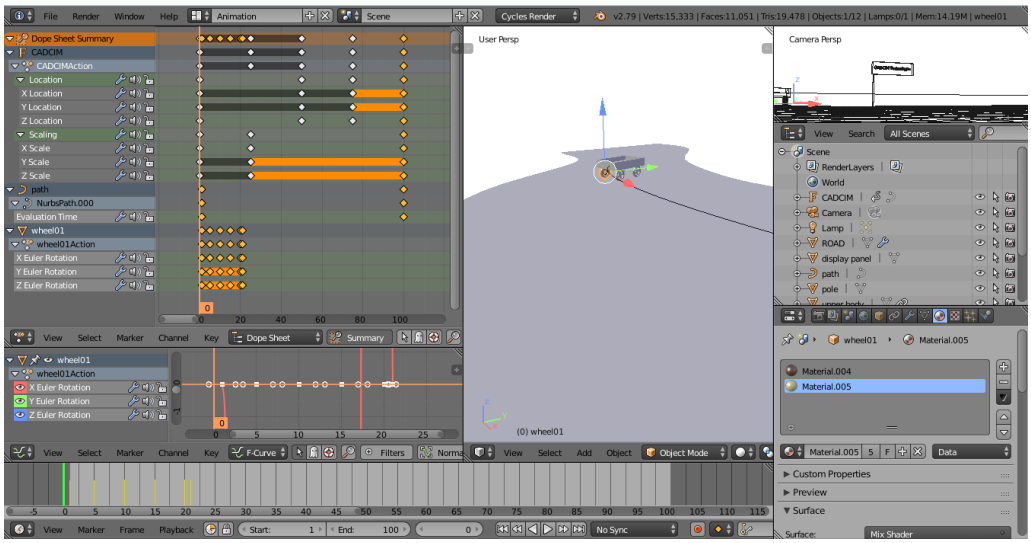

Figure 9-7 *The Animation layout*

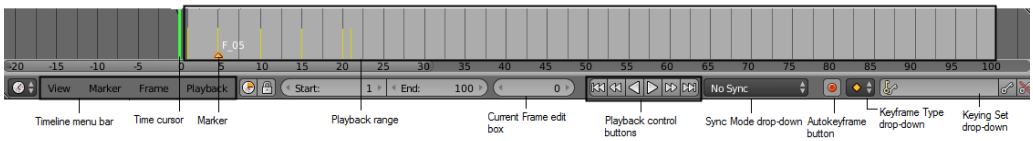

Figure 9-8 *The* ***Timeline***

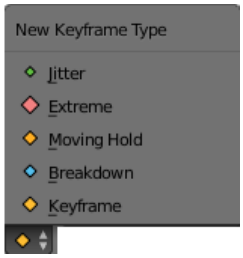

Figure 9-9 *The* ***Keyframe Type*** *drop-down*

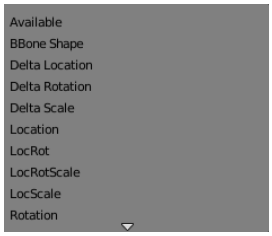

Figure 9-10 *The* ***Keying Set*** *drop-down*

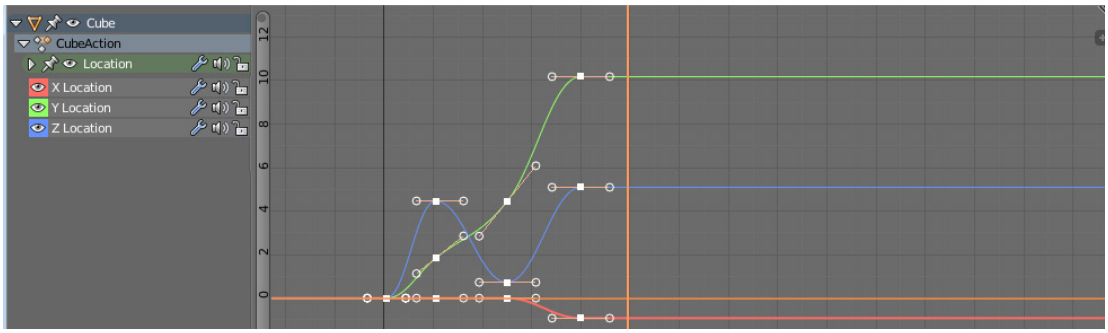

Figure 9-11 *The* ***Graph Editor***

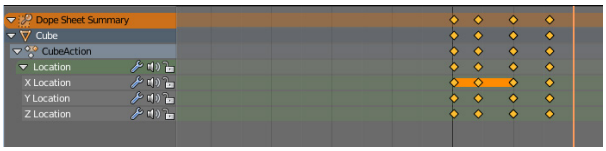

Figure 9-12 *The* ***Dopesheet***

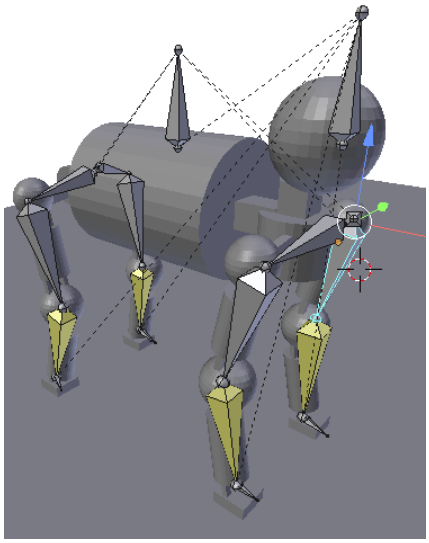

Figure 9-13 *The rig of a cartoon animal*

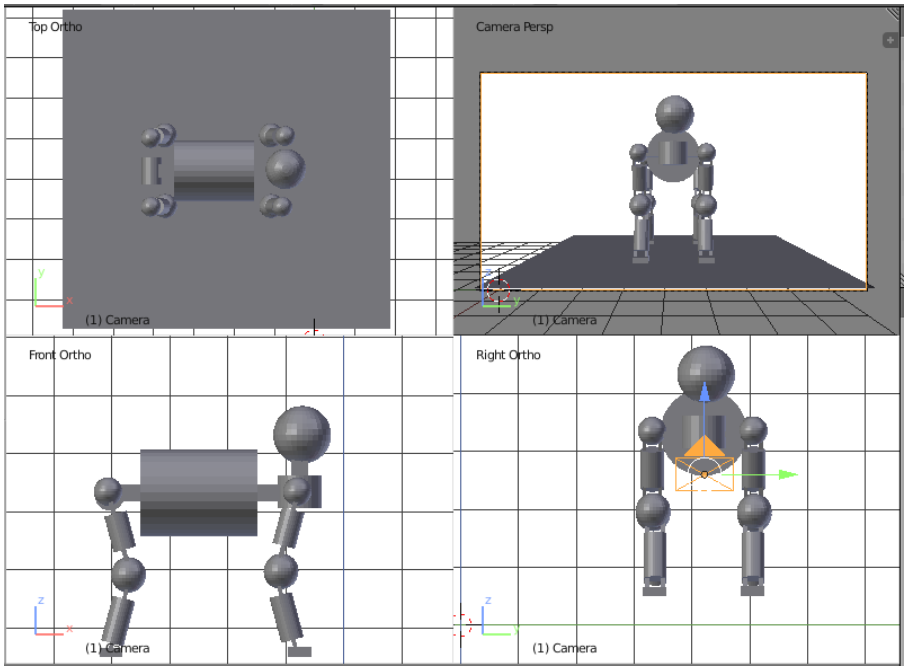

Figure 9-14 *The c09_tut1_start file*

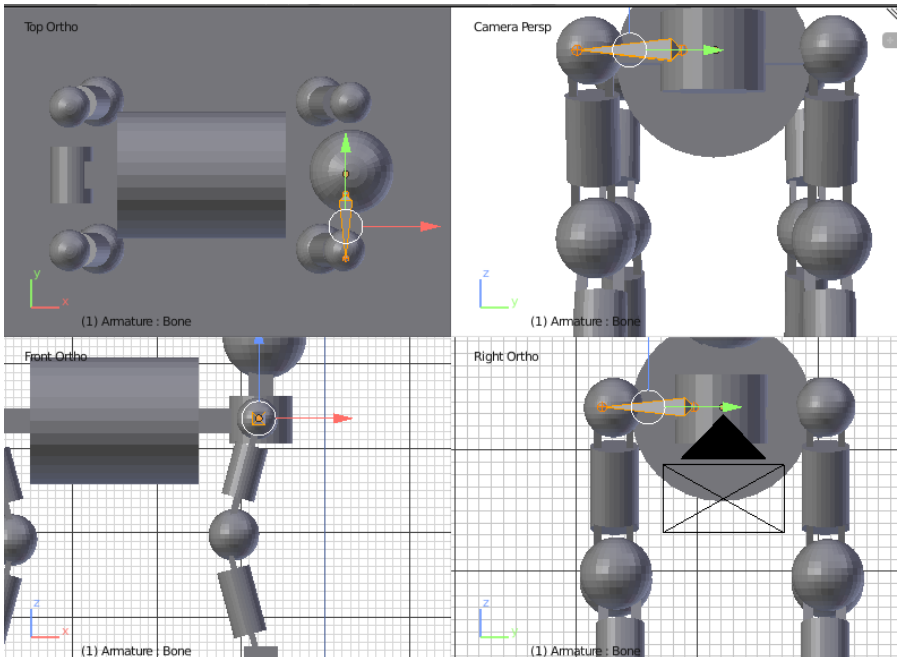

Figure 9-15 *The Armature aligned*

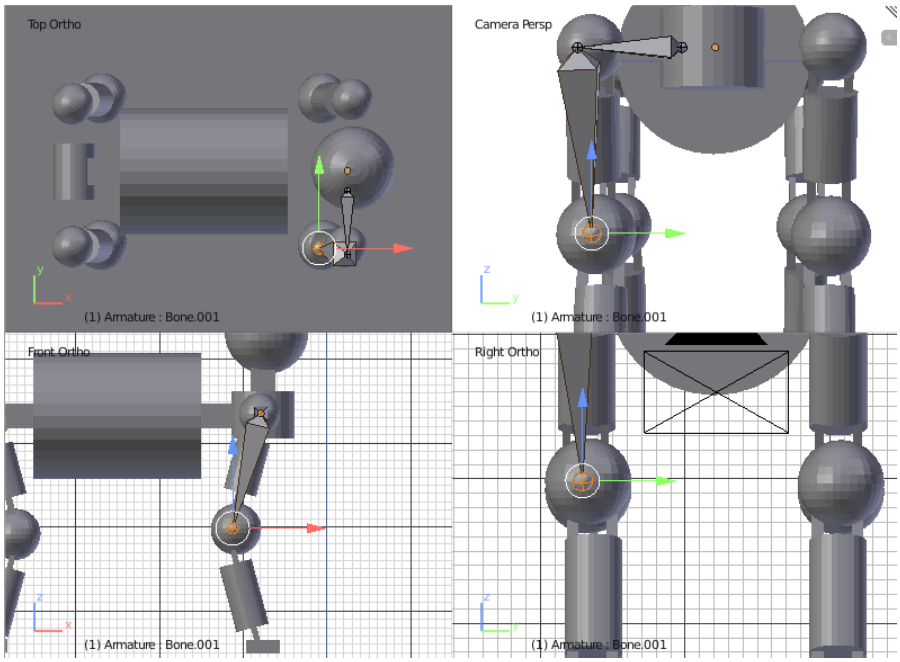

Figure 9-16 *Extruded Armature aligned*

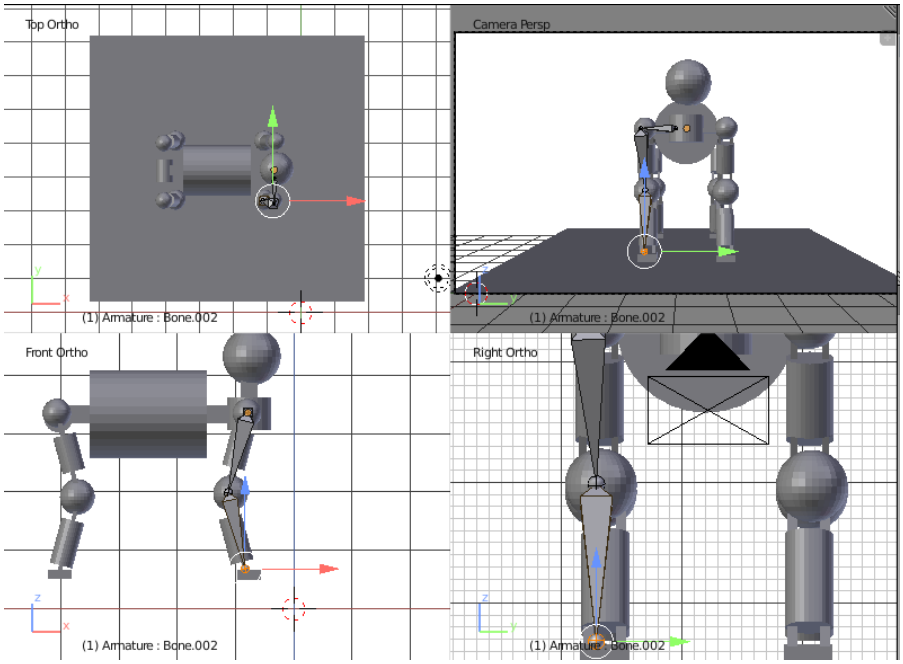

Figure 9-17 *Extruded Armature aligned*

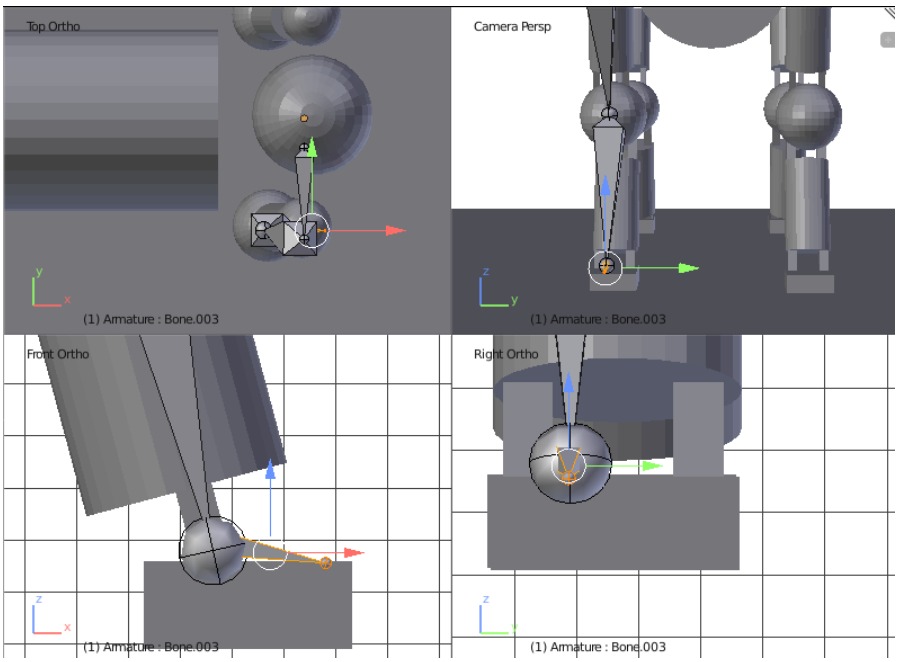

Figure 9-18 *Bone.003 aligned*

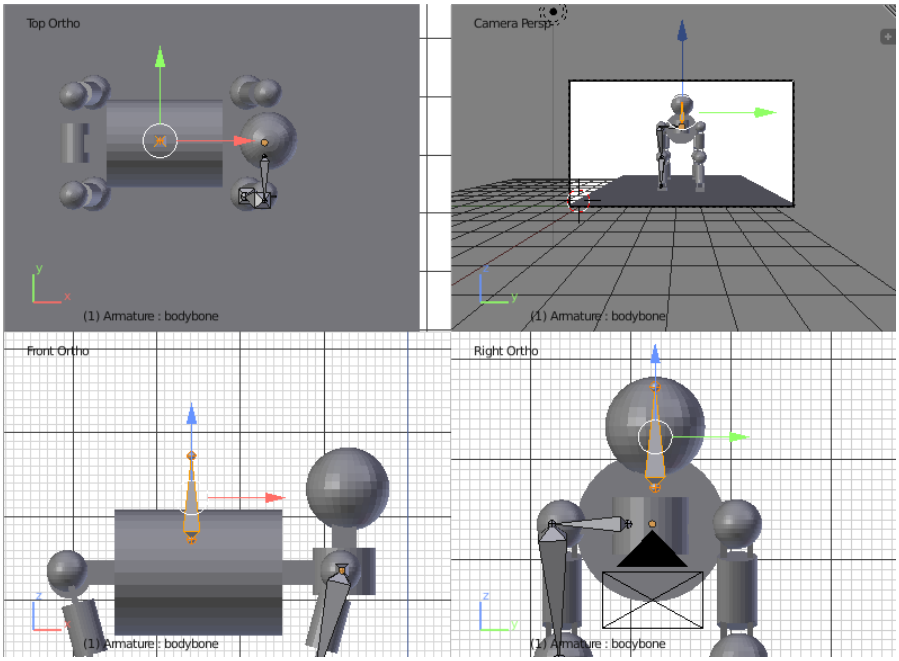

Figure 9-19 *The bodybone aligned*

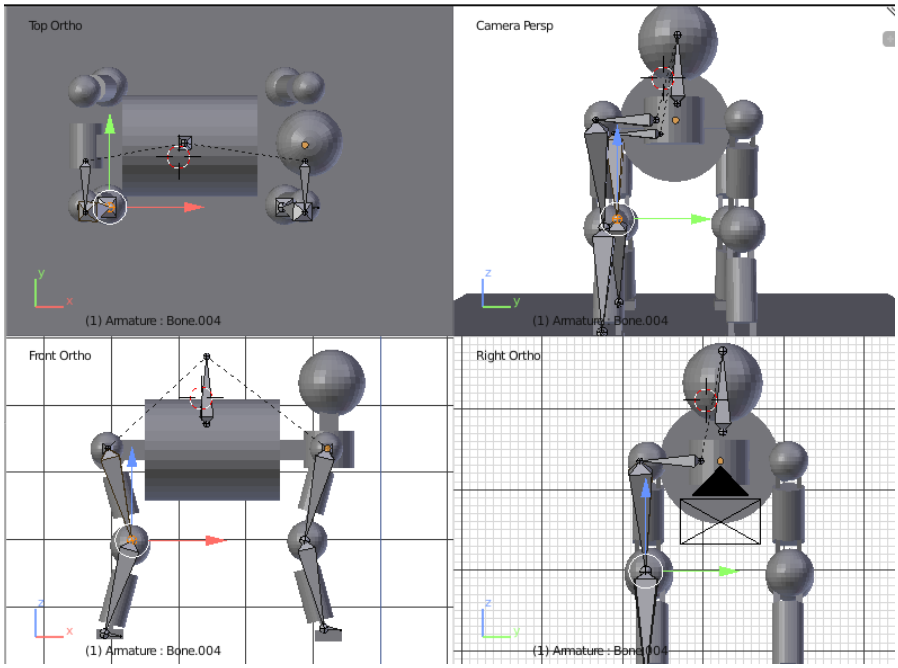

Figure 9-20 *Copy of bone chain aligned*

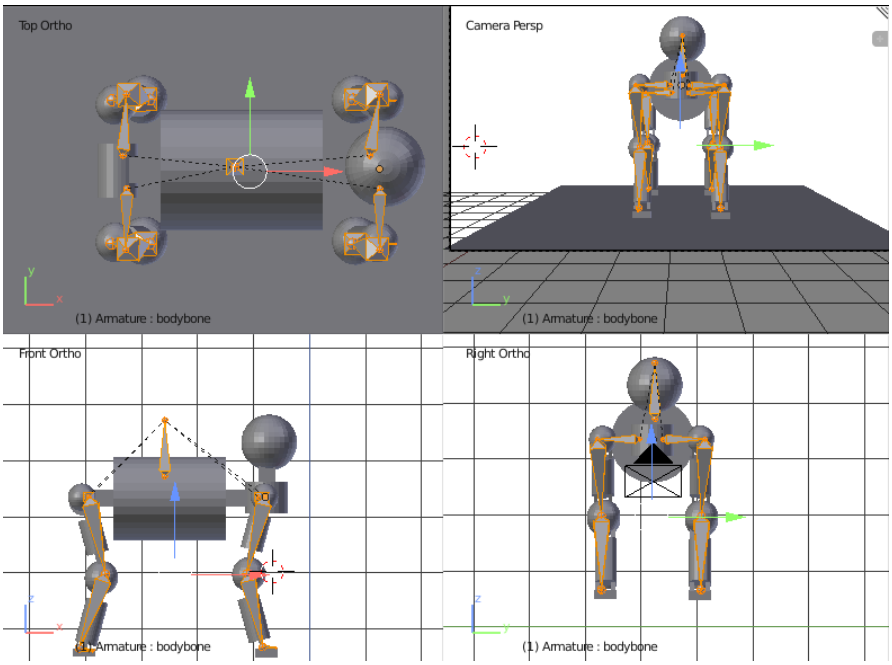

Figure 9-21 *All bone chains aligned*

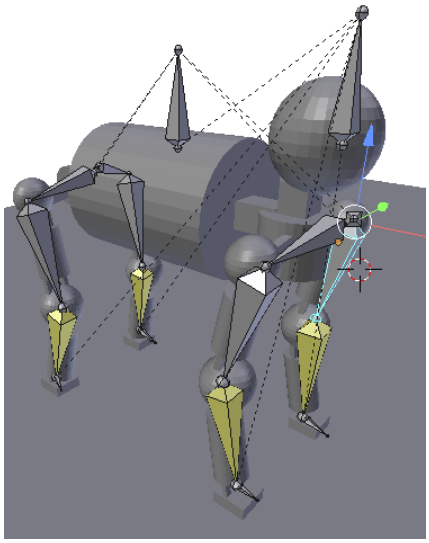

Figure 9-22 *All interconnected bones*

Figure 9-23 *The text and cart at frame 55*

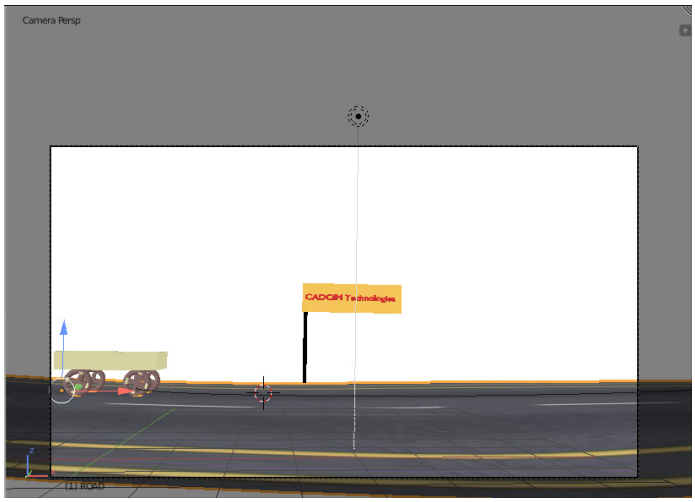

Figure 9-24 *The c09_tut2_start file*

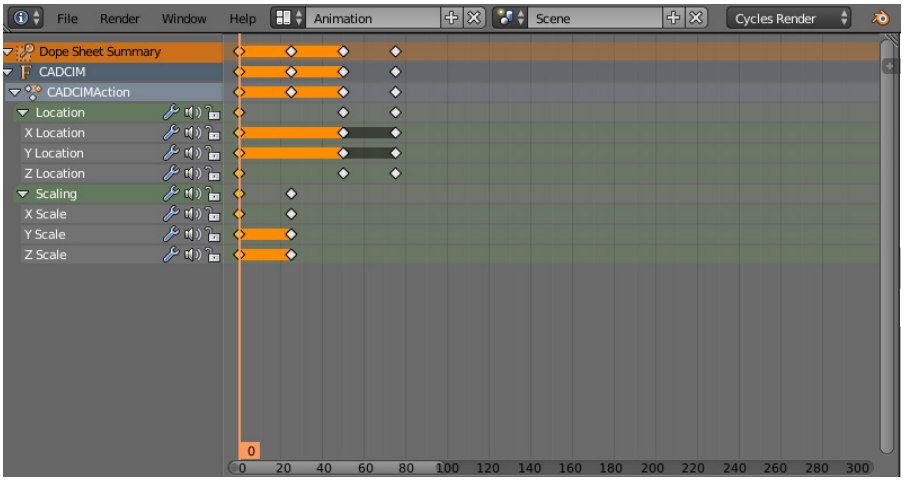

Figure 9-25 *Selected keyframes at frame 0*

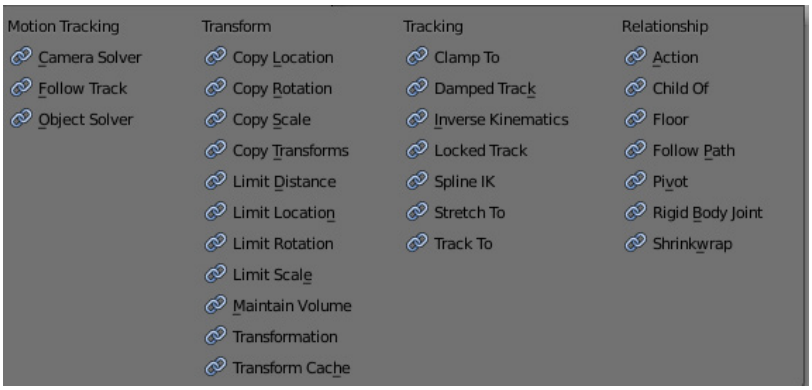

Figure 9-26 *The* ***Add Object Constraint*** *drop-down*

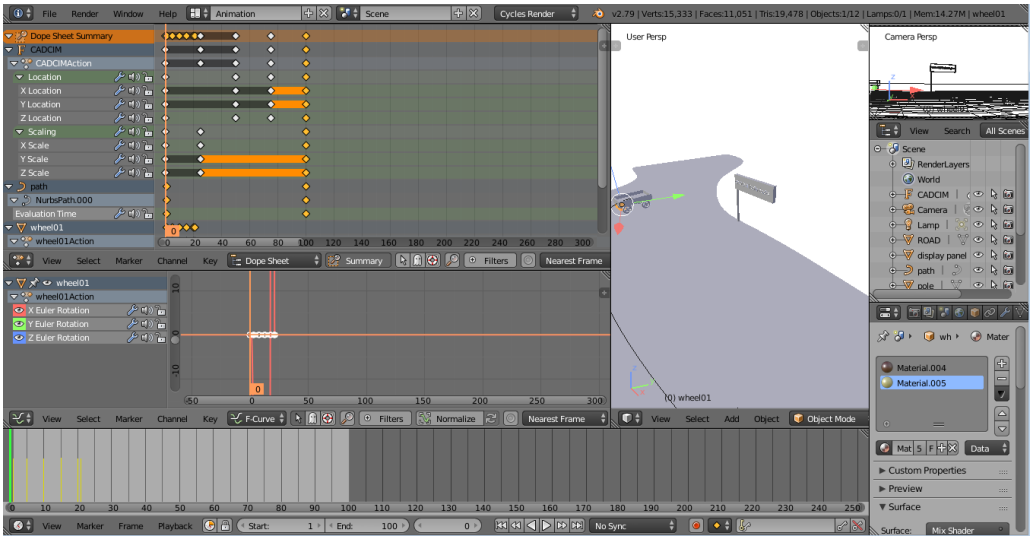

Figure 9-27 *The Animation layout*

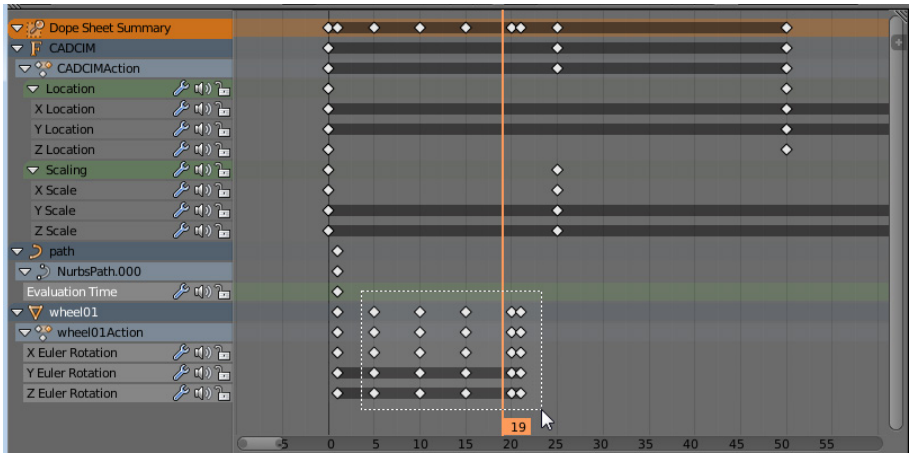

Figure 9-28 *Selected keyframes in* ***Dopesheet***

Figure 9-29 *The model of a table lamp*

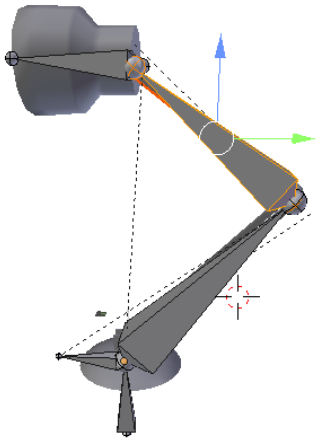

Figure 9-30 *The rig of a table lamp*

Chapter 10

Rigid Body Dynamics

Learning Objectives

After completing this chapter, you will be able to:

- *Create active and passive rigid bodies*
- *Simulate various physical effects*
- *Understand rigid body constraints*

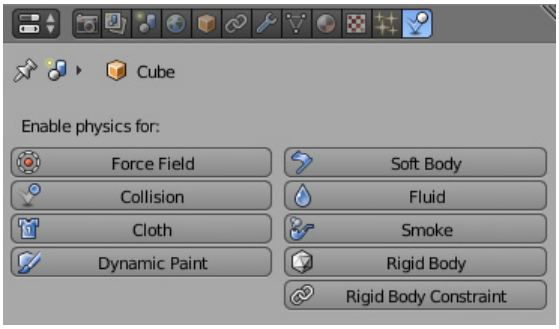

Figure 10-1 *Various buttons in the* ***Enable physics for*** *area*

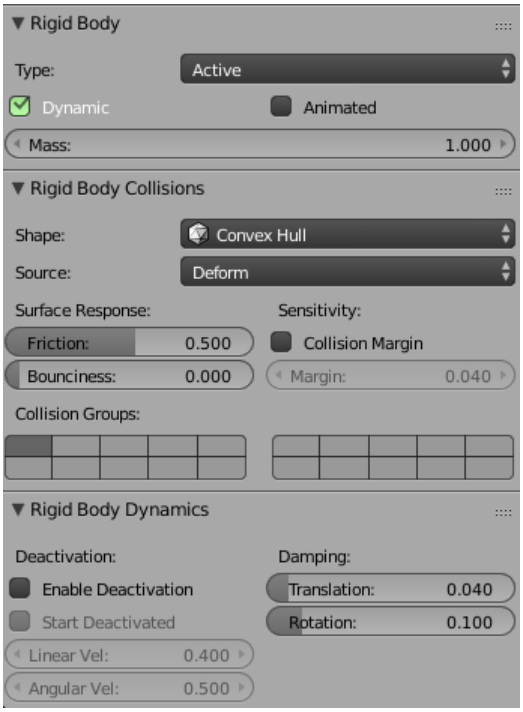

Figure 10-2 *Various panels in* ***Properties Editor***

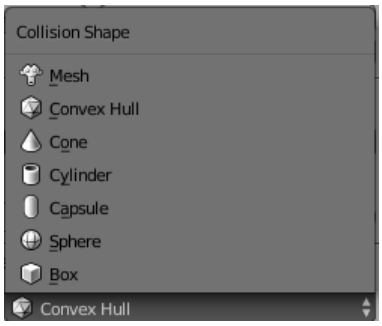

Figure 10-3 *The* ***Shape*** *drop-down*

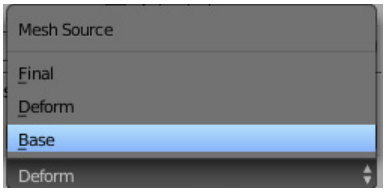

Figure 10-4 *The* ***Source*** *drop-down*

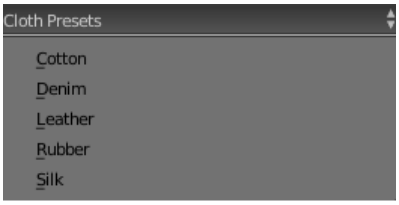

Figure 10-5 *The* ***Cloth Preset*** *drop-down*

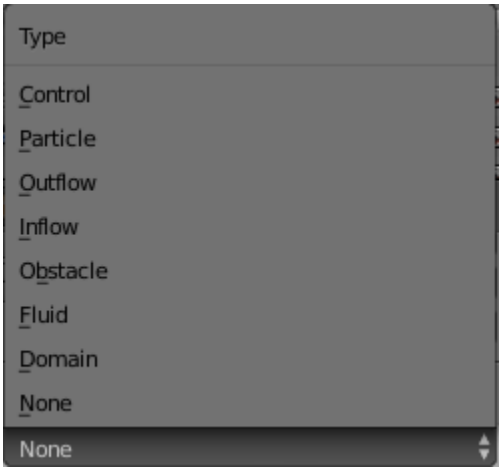

Figure 10-6 *The* ***Type*** *drop-down*

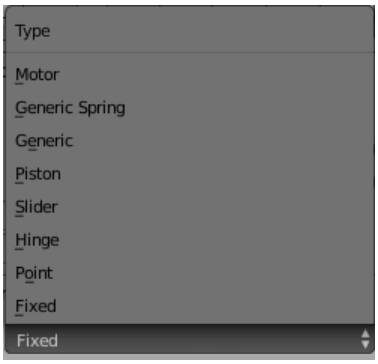

Figure 10-7 *The* ***Type*** *drop-down*

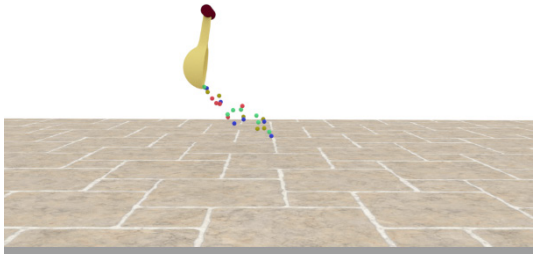

Figure 10-8 *Balls falling from bowl at frame 55*

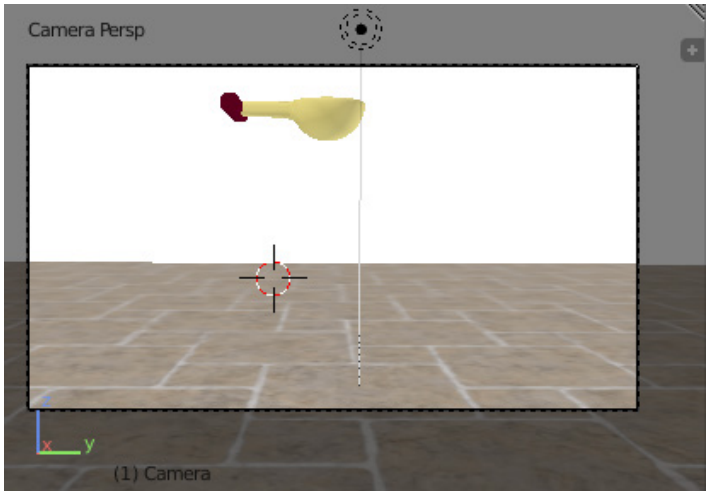

Figure 10-9 *The c10_tut1_start file*

Figure 10-10 *Cloth simulation at frame 35*

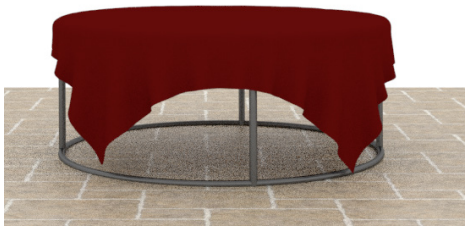

Figure 10-11 *Cloth simulation at frame 100*

Figure 10-12 *The c10_tut2_start file*

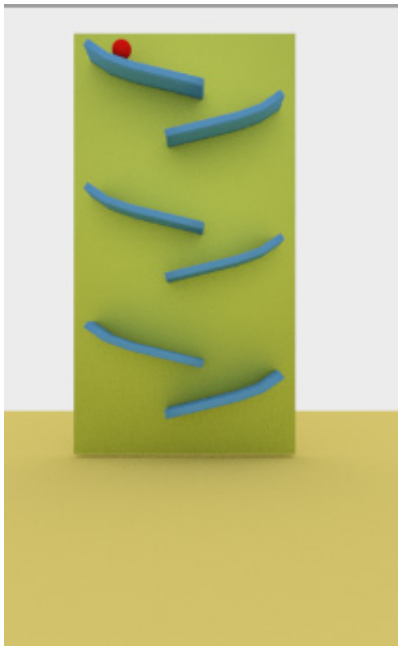

Figure 10-13 *The scene with sliders and a ball*

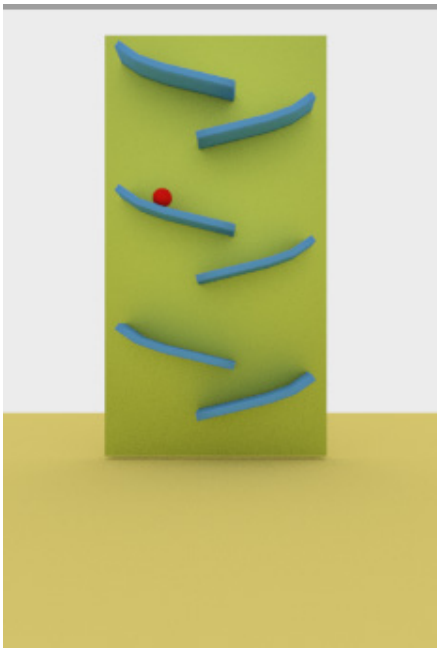

Figure 10-14 *Ball at frame 504*

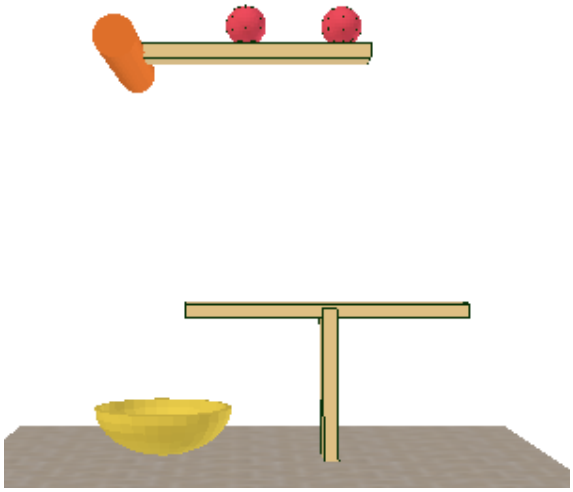

Figure 10-15 *The scene with two assemblies, balls, and a bowl*

Figure 10-16 *Simulation at frame 25*

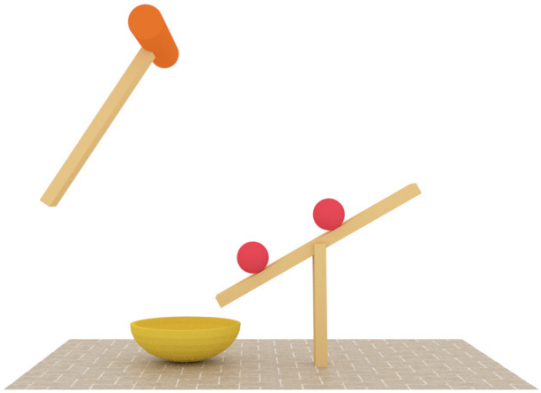

Figure 10-17 *Simulation at frame 45*

Chapter 11

Working with Particles

Learning Objectives

After completing this chapter, you will be able to:

- *Understand particle system*
- *Understand various simulation techniques*

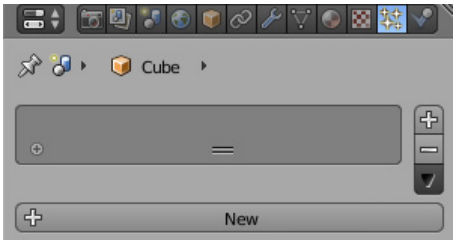

Figure 11-1 *The* ***Properties Editor*** *on choosing the* ***Particles*** *button*

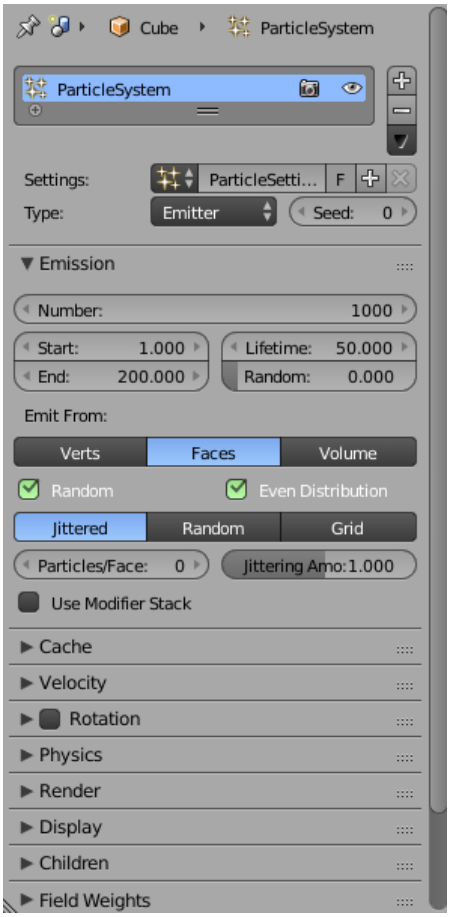

Figure 11-2 ***Properties Editor*** *on choosing the* ***New*** *button*

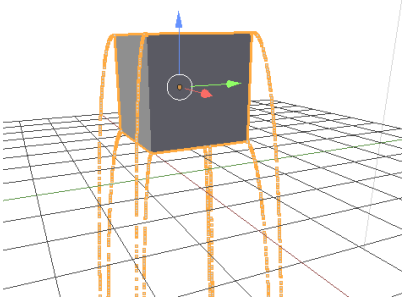

Figure 11-3 *Particles emitted from the cube on choosing the* ***Verts*** *button*

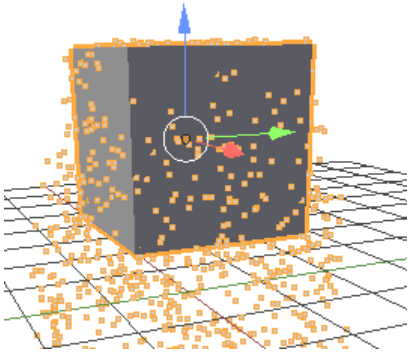

Figure 11-4 *Particles emitted from the cube on choosing the* ***Faces*** *button*

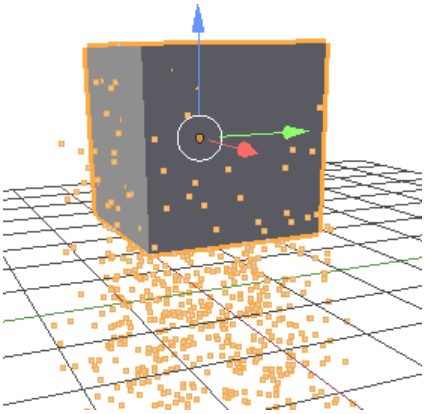

Figure 11-5 *Particles emitted from the cube on choosing the* ***Volume*** *button*

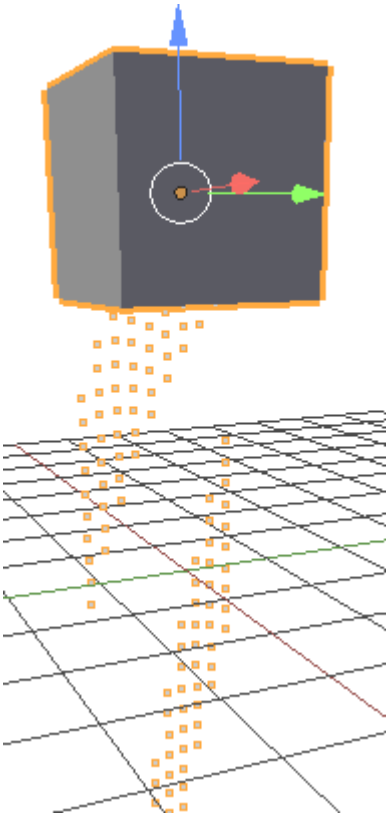

Figure 11-6 *Particles emitted from the cube on choosing the* ***Grid*** *button*

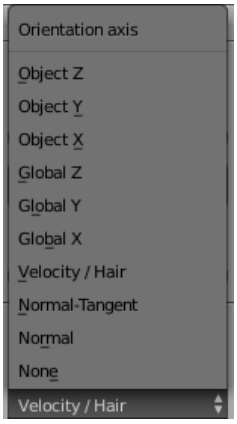

Figure 11-7 *The* ***Orientation*** *drop-down*

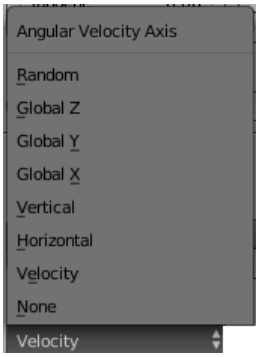

Figure 11-8 *The* ***Angular Velocity*** *drop-down*

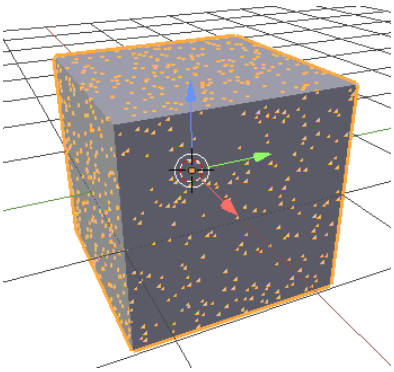

Figure 11-9 *Particles emitted from the cube on choosing the* ***No*** *button*

Figure 11-10 *Parameters in the* ***Physics*** *panel on choosing the* ***Newtonion*** *button*

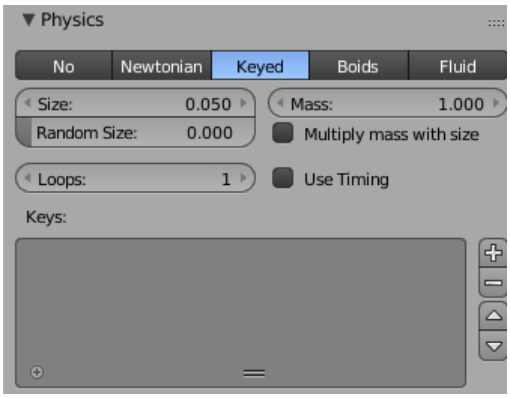

Figure 11-11 *Parameters in the* ***Physics*** *panel on choosing the* ***Keyed*** *button*

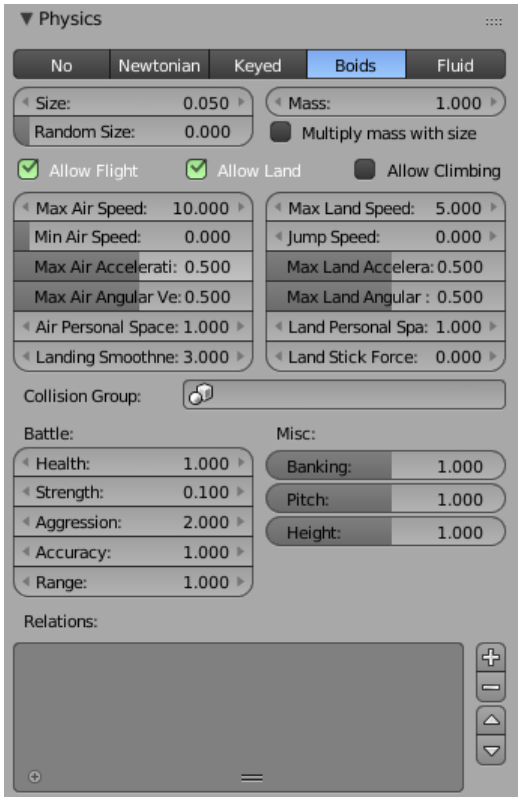

Figure 11-12 *Parameters in the* ***Physics*** *panel on choosing the* ***Boids*** *button*

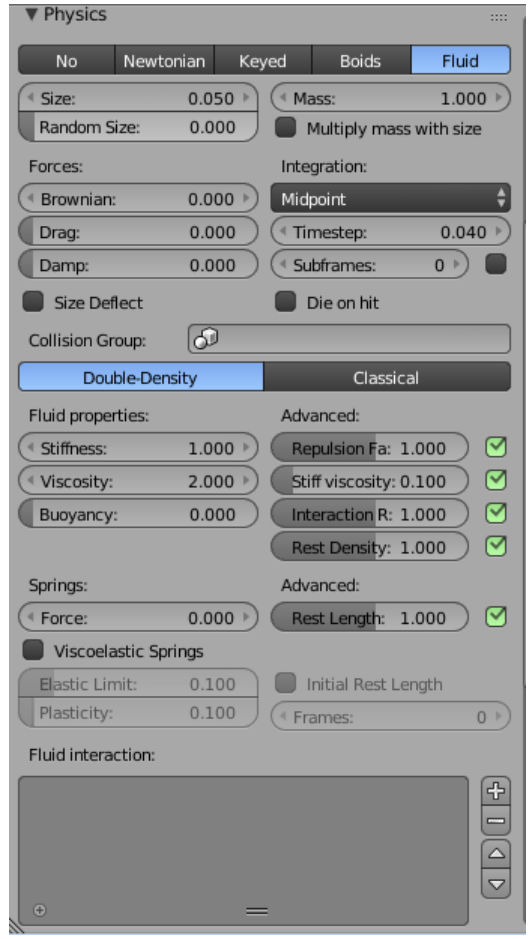

Figure 11-13 *Parameters in the* ***Physics*** *panel on choosing the* ***Fluid*** *button*

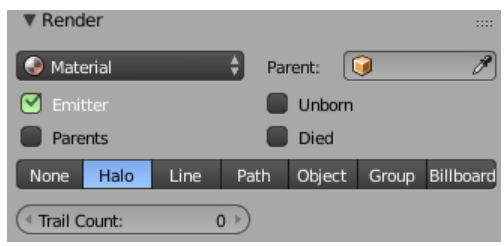

Figure 11-14 *The parameters in the* ***Render*** *panel*

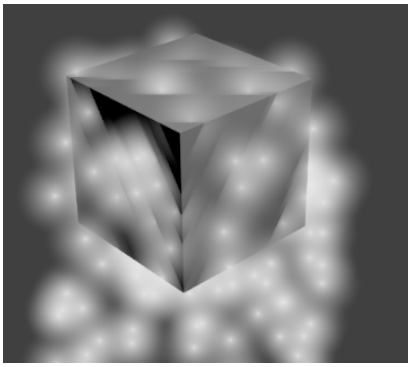

Figure 11-15 *Rendered halo particles*

Figure 11-16 *The particles emitted as lines*

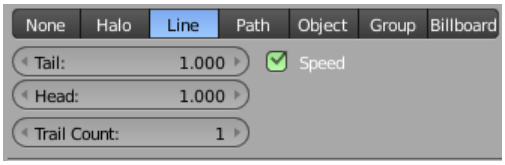

Figure 11-17 *The parameters in the* ***Render*** *panel*

Figure 11-18 *Smoke simualtion at frame 80*

Figure 11-19 *The c11_tut1_start file*

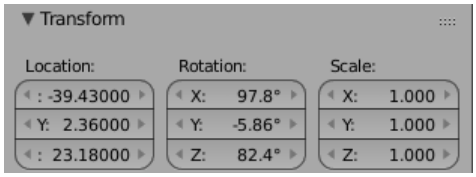

Figure 11-20 *Values in the* ***Transform*** *panel*

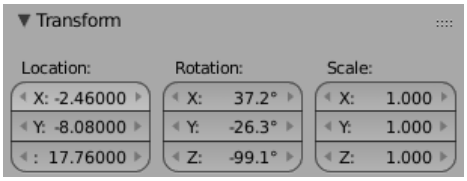

Figure 11-21 *Values in the* ***Transform*** *panel*

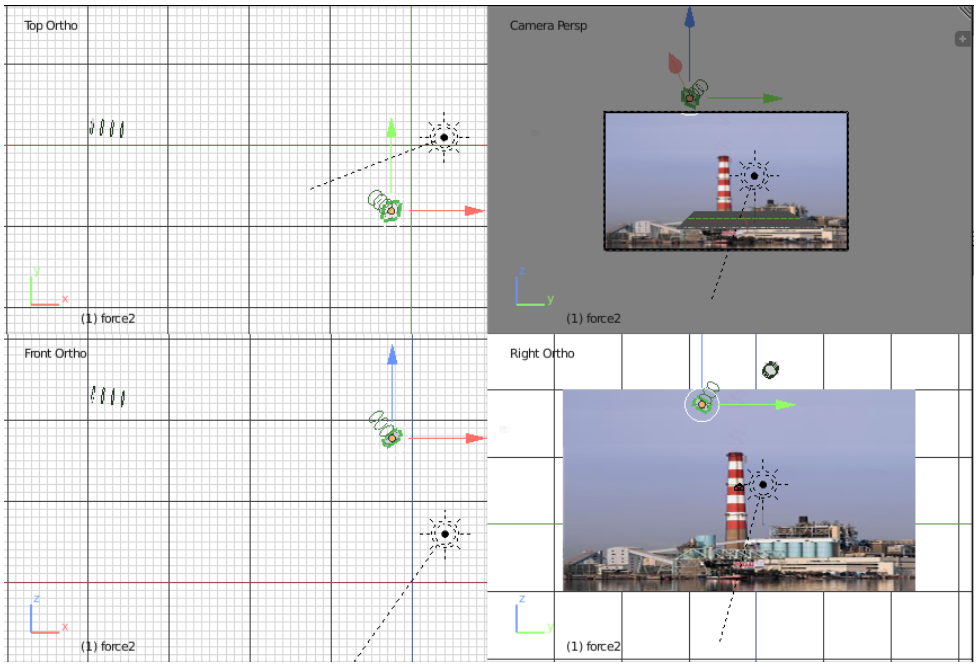

Figure 11-22 *The force1 and force2 aligned*

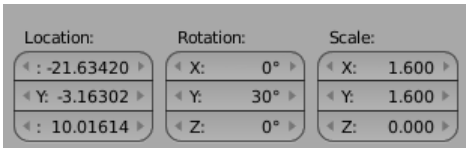

Figure 11-23 *Values in the* ***Transform*** *panel*

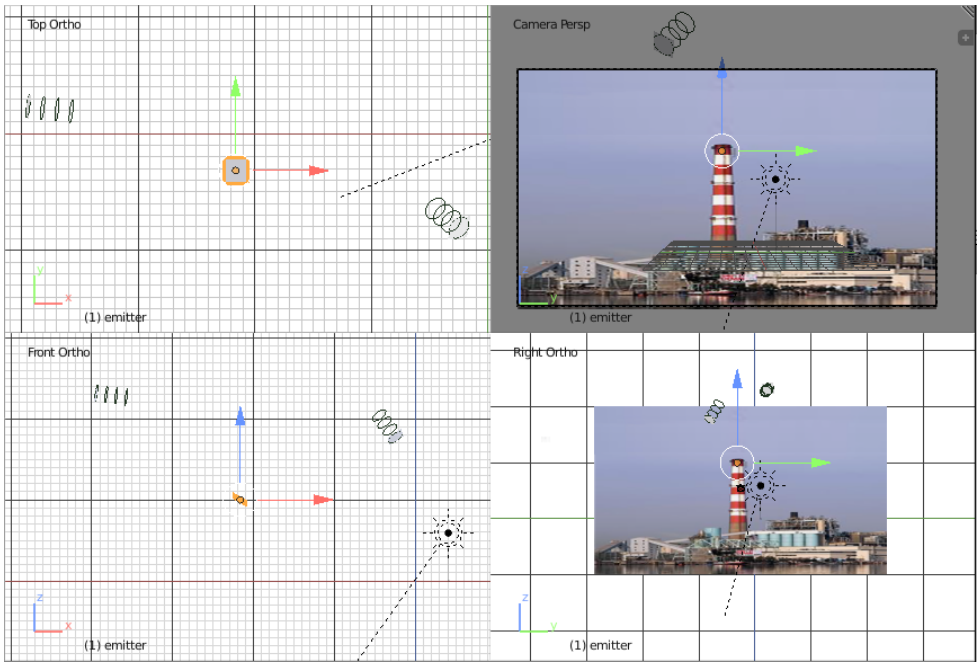

Figure 11-24 *The emitter aligned*

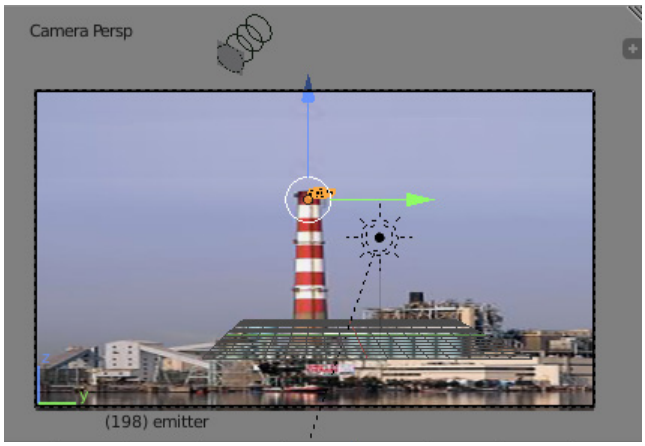

Figure 11-25 *Particles emitted from emitter*

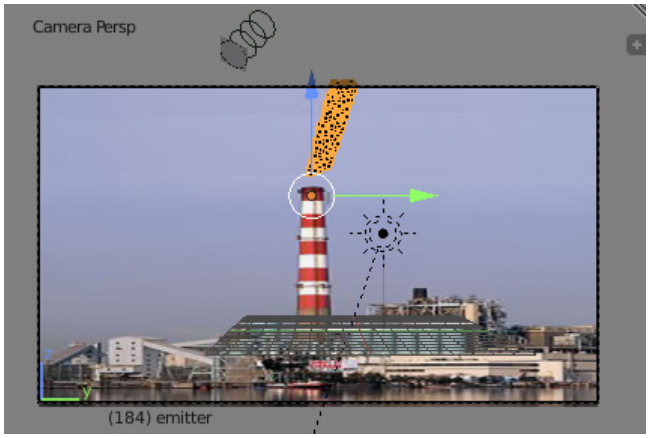

Figure 11-26 *Change in number and lifetime of particles*

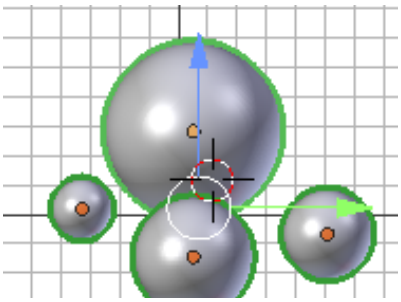

Figure 11-27 *Spheres of different sizes*

Figure 11-28 *Parameters in the* ***Image Texture*** *node*

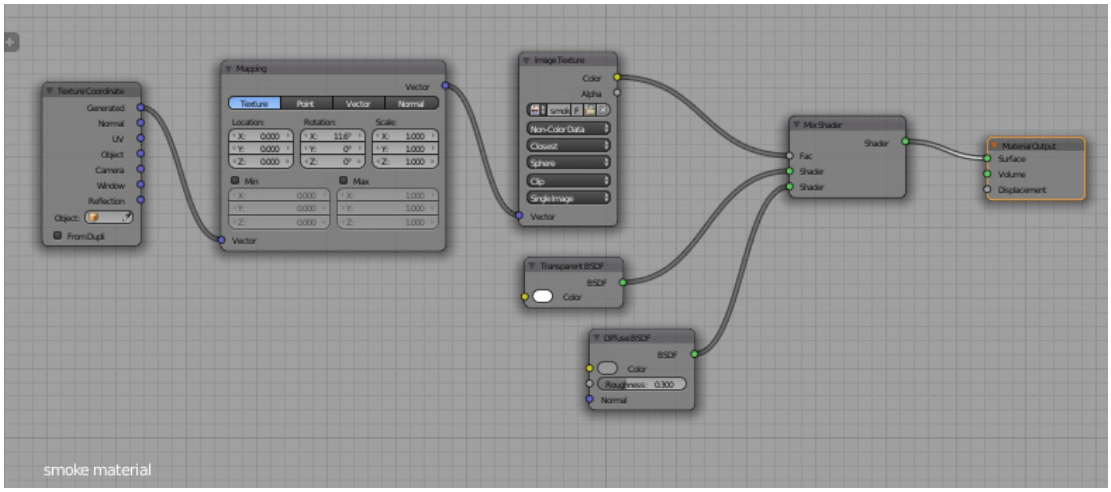

Figure 11-29 *Node network for smoke material*

Figure 11-30 *Smoke simulation at frame 80*

Figure 11-31 *Snow simulation at frame 100*

Figure 11-32 *Adjusting the view*

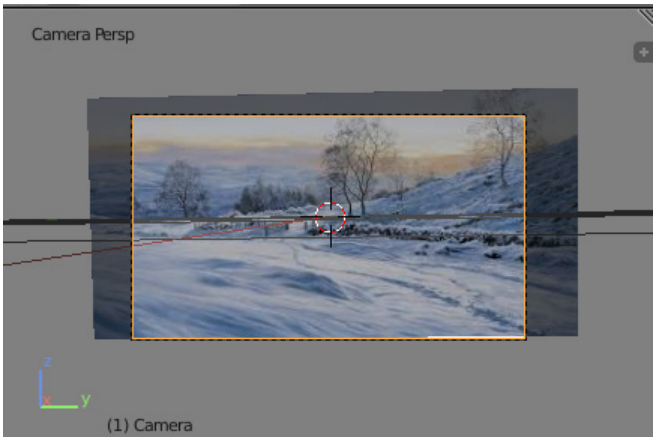

Figure 11-33 *Camera Persp view displayed*

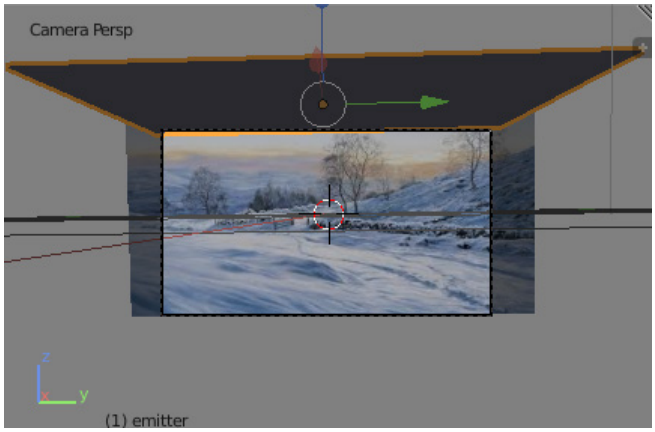

Figure 11-34 *Emitter aligned*

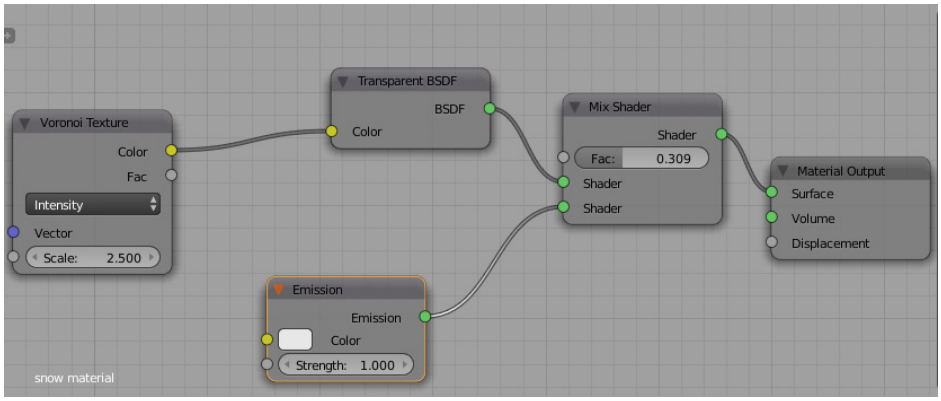

Figure 11-35 *Node network for snow material*

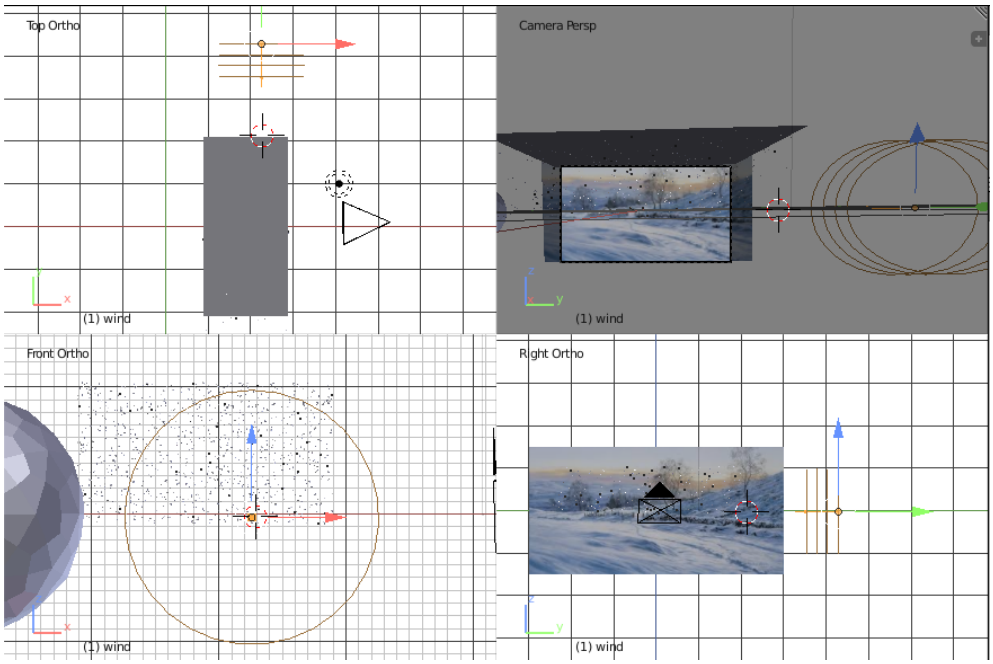

Figure 11-36 *wind aligned*

Figure 11-37 *Rain simulation*