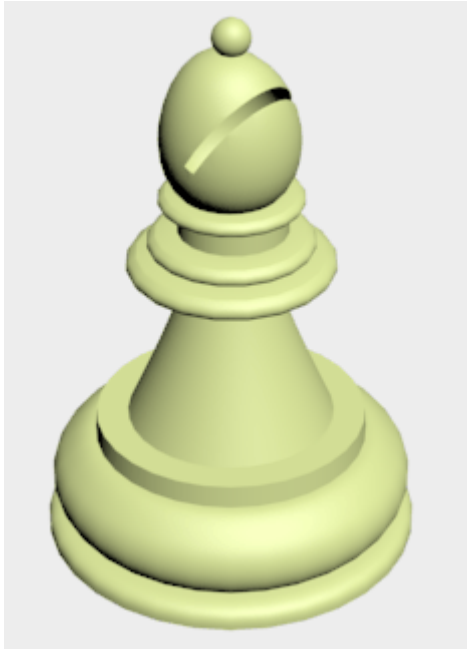## Modeling a Bishop

In this lesson you will model a bishop for the chess set. As with the rook, the base of the bishop has already been created. You will add the "miter" on top of the bishop.

Features and techniques covered in this lesson:

- Using "soft selection" to create a free-form shape.
- Using Lock Selection to transform only what you want to.
- Using Boolean to subtract (instead of add) geometry.

Skill Level: Beginner

Time to complete: 15 minutes

Set up the lesson:

- Open the file *bishop_base.max*.

  This file contains the base of the bishop.

Create a sphere:

The top of the bishop begins as a sphere.

1. Go to the Create panel and click Geometry. Make sure Standard Primitives is chosen in the drop-down list, and click Sphere.

2. In the Top viewport, drag from the center out to create a sphere. On the Parameters rollout, set its Radius to **18.0**.

Position the sphere:

1. Make sure the sphere is selected and the Top viewport is active. On the toolbar, click Align. Then in the Top viewport, click the base of the bishop.

   An Align Selection dialog is displayed.

2. On the dialog, make sure Center is chosen in both the Current Object and Target Object

groups. In the Align Position (Screen) group, turn on the X, Y, and Z positions, then click OK.

This aligns the vertical centers of the two parts of the bishop.

3. [lock icon] On the status bar, click to turn on Lock Selection.

You are going to move the sphere, and this prevents you from accidentally moving the base instead.

Tip: SPACEBAR is the keyboard shortcut for Lock Selection.

4. [move icon] In the Left viewport, move the sphere vertically. Leave part of it sunk into the top of the base.
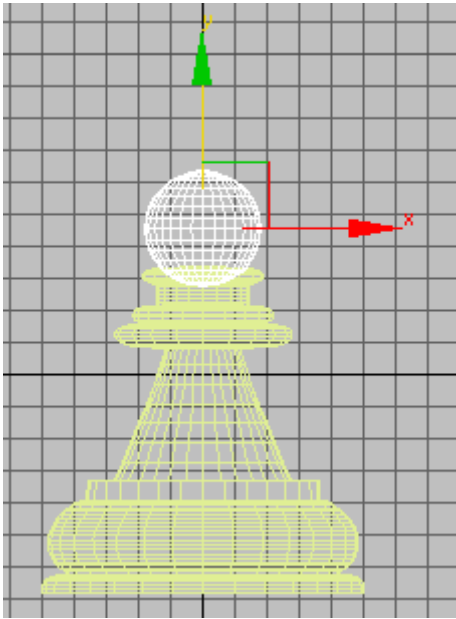
5. [lock icon] Turn off Lock Selection.

6. Save this scene as **my_bishop.max**.

Turn the sphere into an editable mesh:

- Right-click the sphere, and from the Transform (lower-right) quadrant of the quad menu, choose Convert To > Convert To Editable Mesh.

Use soft selection to stretch the mesh:

1. [modify icon] If you are not already there, go to the Modify panel.
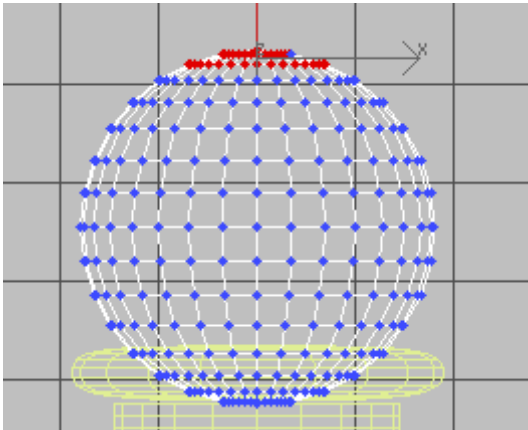
2. [zoom icon] In the Left viewport, region zoom in on the sphere at the top of the bishop. Leave a bit of space above for it to grow.

3. [plus icon] In the modifier stack display, click the plus icon to expand the Editable Mesh's sub-object levels. Click the Vertex sub-object level to make this level active.
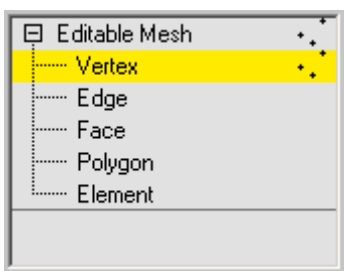
4.   ▫ In the Left viewport, drag a box to select the top two rows of vertices.


5.   Go to the Soft Selection rollout, and turn on Use Soft Selection.

Soft selection provides a sort of gravity field: when soft selection is on and you move sub-objects, they drag other sub-objects along with them. Sub-objects affected by soft selection are indicated by how "hot" their color appears in viewports. The Falloff value controls the size of the affected area.
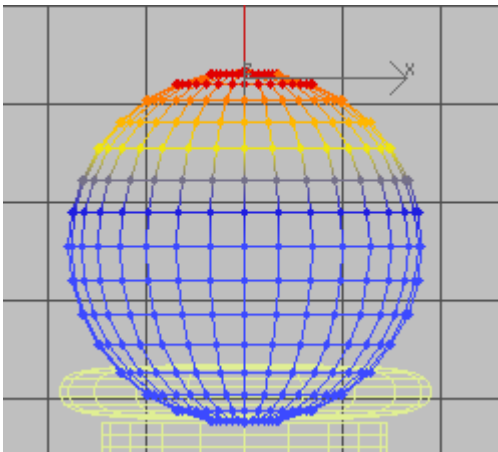
6.   Increase the Falloff to about **28.0**, so soft selection will affect the sphere's upper vertices, but not its lower ones.
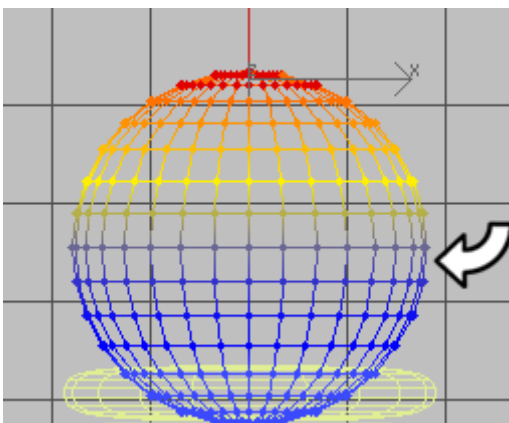

Vertices above the arrow are affected by soft selection. Vertices below it, shown in blue, are not.

7.   ⊕ Turn on Select and Move, and move the selected vertices vertically about 8 units. (You can see the amount of units displayed in the Y field of the XYZ spinners on the status bar, below the viewports.)

Note: You can use real-world units such as inches and feet, or meters if you like. In this tutorial you are using standard generic units which have no corresponding value in the real world.

With soft selection, other vertices trail after the selected ones, creating a characteristic egg-like shape for the top of the bishop.
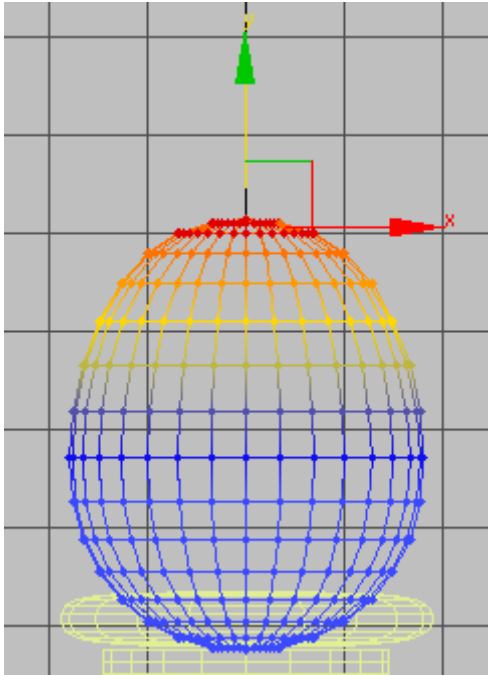

8. In the modifier stack display, click Editable Mesh to turn off the Vertex sub-object level.

Create the knob at the very top:

These steps are a miniature version of creating the main top piece.

1. Go to the Create panel and click Geometry. Make sure Standard Primitives is chosen in the drop-down list. Click Sphere.

2. In the Top viewport, drag to create another sphere. Set its Radius to **5.0**.

3. With the sphere selected and the Top viewport active, click Align. Then in the Top viewport, click the base of the bishop.

    An Align Selection dialog is displayed.

4. On the dialog, in the Align Position (Screen) group, turn on Z position, then click OK.

    This aligns the knob to the rest of the bishop.

5. On the status bar, click to turn on Lock Selection.

6. Activate the Left viewport, and then click Zoom Extents.

    The Zoom Extents button is one of the viewport navigation buttons in the lower-right corner of the **3ds max** window.

7. In the Left viewport, move the sphere vertically so it caps the chess piece.
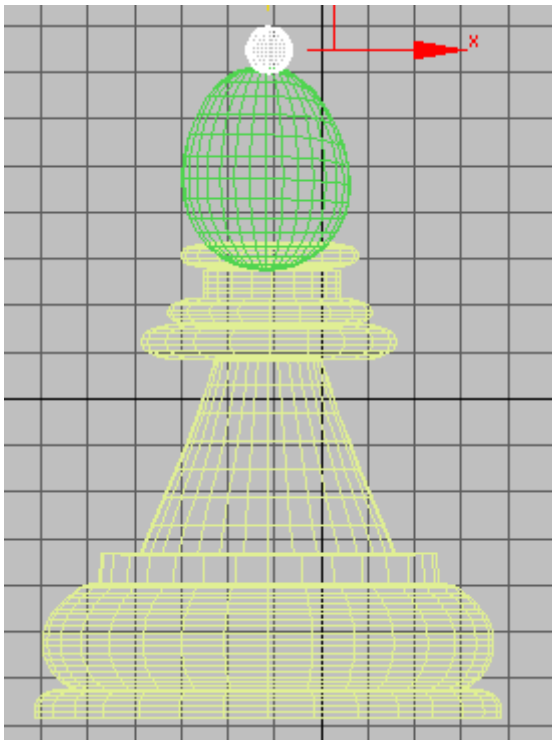
8. 🔒 Turn off Lock Selection.

9. Choose File > Save.

Consolidate the model:

1. ⬆ Select the base of the bishop.

2. 📐 Go to the Modify panel, and in the Name field, rename the object **Bishop**.

3. 📐 On the Modify panel, go to the Edit Geometry rollout, and turn on Attach.

4. Click each sphere object to make it part of the mesh.

5. Choose File > Save.

Create a box to slice the "miter," and position it:

1. ⭐ ⚫ Go to the Create panel and click Geometry. Make sure Standard Primitives is chosen in the drop-down list, then click Box.

2. In the Left viewport, drag to create a box. Set the box's Width to **3.0**. The Length and Height values don't matter, but they should be somewhat larger than the dimensions of the egg shape of the bishop's top.

   (In the Left viewport, you should be looking at the box edge-on. That is, in the Left viewport, the narrow Width side of the box should face you.)

3. Set the box's Length, Width, and Height Segments ("Segs") all equal to **7**.

   Important: This is an important step, because if there is too big a difference in the complexity of geometry, the Boolean operation might not work correctly.
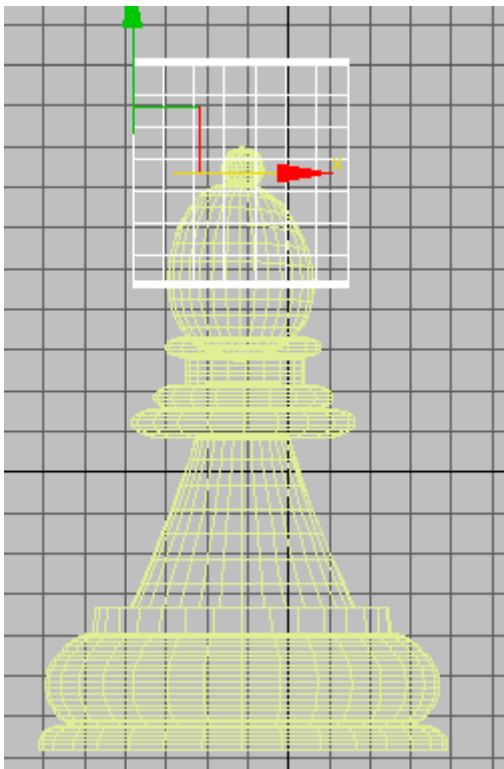
4. ↻ ✛ In the Left viewport, Rotate the box about **–30** degrees, and then Move it so it intersects the top of the bishop.
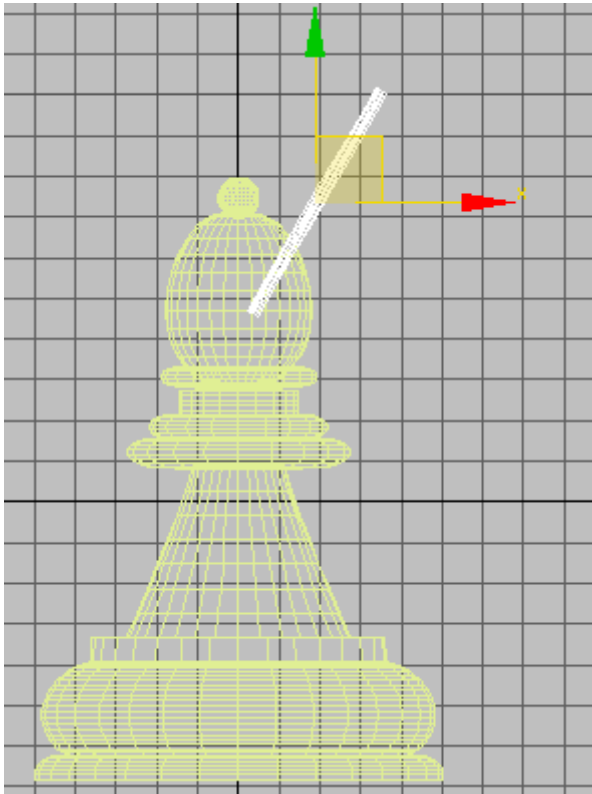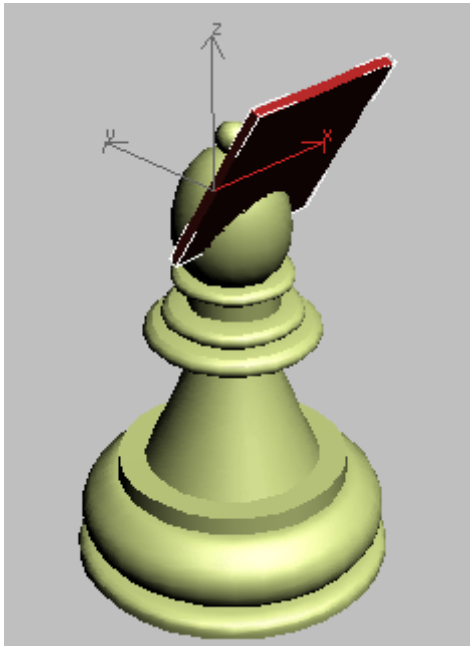
Box intersecting the bishop in the Left viewport

5. In the Front viewport, move the box so it intersects the entire width of the bishop top.


Box intersecting the bishop in the Front viewport

The box intersection in a Perspective viewport

Create the slice using Boolean:

1. Select the base of the bishop, rather than the box.

2. On the Create > Geometry panel. choose Compound Objects from the drop-down list.

3. Click to turn on Boolean.

4. On the Pick Boolean rollout, click Pick Operand B, and then click the box.

5. On the Parameters rollout, in the Operation group, choose Subtraction (A-B).

   The "miter" of the bishop chess piece now has a slot in it.
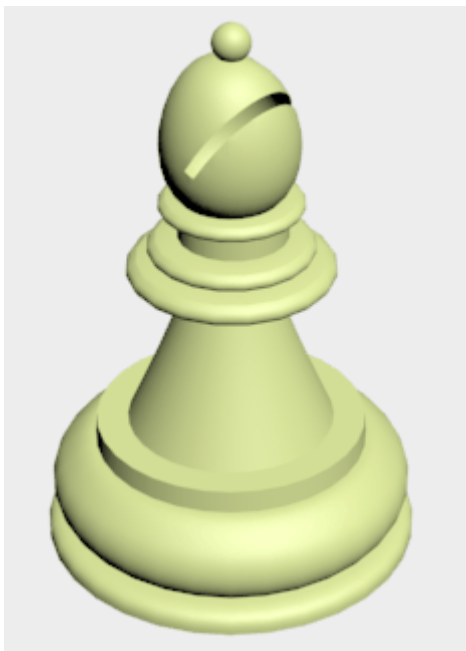
6. Choose File > Save.

   Tip: The "Boolean" topic in the user's reference has guidelines for Boolean modeling. You

should refer to these guidelines before you use Boolean yourself to get the best results from this object type.

Summary

In this lesson, you learned to stretch the geometry using soft selection of vertices. You learned to align objects with the align tool, and you cut a hole in the object using Boolean operations.

Next

Modeling a Knight

Comments