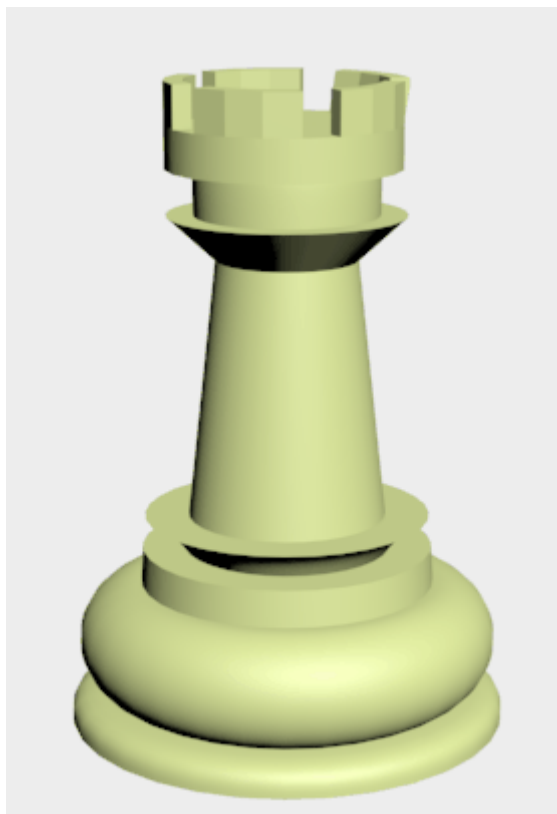


Modeling a Rook

In this lesson, you will model a rook for the chess set. The base of the rook has already been created. You will add the battlement on top of the rook. If you were making a wooden chess set, this is a part of the piece for which you could not use a lathe, and so it is with the 3D model: although the base of the rook is a lathed spline, like the pawn's, its top uses a different modeling technique.



Features and techniques covered in this lesson:

- Using Align to align objects.
- Using face extrusion to change geometry.
- Using a Boolean operation to combine two pieces of geometry.



Time to complete: 15 minutes

Set up the lesson:

- Open the file *rook_base.max*.
This file contains the base of the rook.



Create a cylinder:

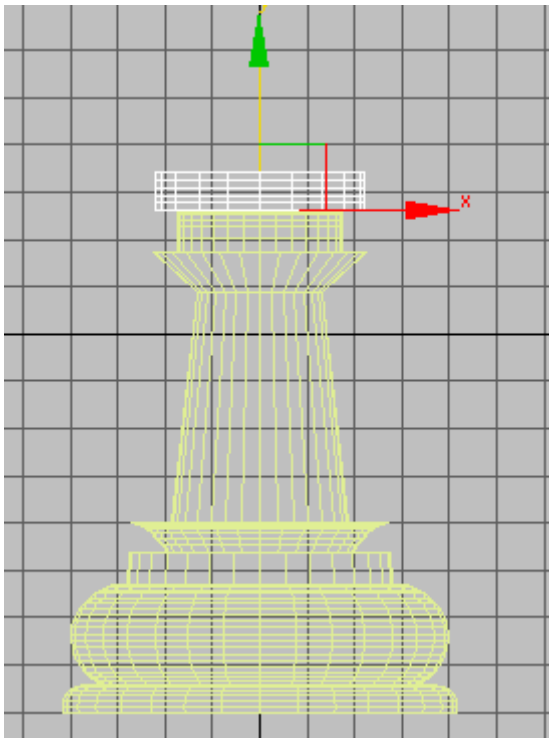
The top of the rook begins as a cylinder.

1.   Go to the Create panel and click Geometry. Make sure Standard Primitives is chosen in the drop-down list. Click Cylinder.
2. Create a cylinder in the Top viewport. First, drag from the center outward to set a preliminary radius. Release the mouse, and then drag to set a preliminary height.
3. On the Parameters rollout, set the cylinder's Radius to **22.0** and its Height to **8.0**. Also, set Cap Segments to **6** and Sides to **20**.

These values for Cap Segments and Sides subdivide the cylinder so you can easily create a battlement after you turn the cylinder into a mesh.

Position the cylinder:

-  Make sure the cylinder is selected and the Top viewport is active. On the toolbar, click Align, then in the Top viewport click the base of the rook.
An Align Selection dialog is displayed.
- On the dialog, make sure that 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 rook.
-  Activate the Left viewport, and click Align once again. Then in the Left viewport click the base of the rook.
(Align uses the XYZ axes of the active viewport.)
- In the Align Selection dialog, in the Align Position (Screen) group, turn on Y Position. Then in the Current Object group choose Minimum, and in the Target Object group choose Maximum.
This aligns the bottom of the cylinder to the top of the base, along the viewport's Y axis.





- Save this scene as **my_rook.max**.

Turn the cylinder into an editable mesh:

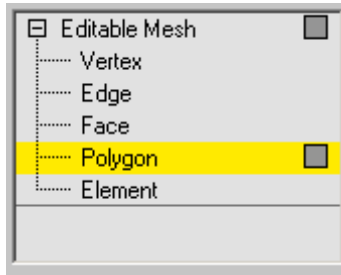
- Right-click the cylinder, and from the Transform (lower-right) quadrant of the quad menu, choose Convert To > Convert To Editable Mesh.

When you convert, you lose the cylinder object's explicit control over the radius, height, and so on, but you gain the ability to do various kinds of editing, including face extrusion.

Create the battlement:

-  If you are not already there, go to the Modify panel.
-  Click the plus icon to expand the Editable Mesh's sub-object levels. Click the Polygon sub-

object level to make this level active.

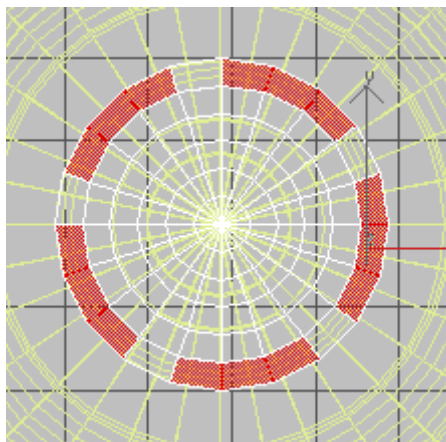


3. On the Selection rollout, turn on Ignore Backfacing.

If Ignore Backfacing is not turned on, you might select other faces inadvertently, and get some weird-looking extrusions.



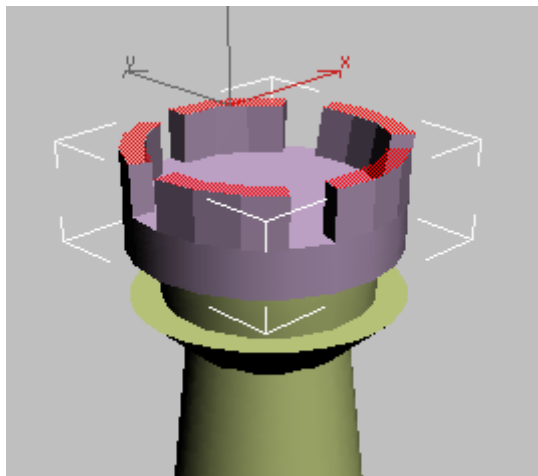
4. In the Top viewport, use CTRL plus Select to select polygons around the rim of the cylinder. Select them in groups of three, leaving out every fourth polygon. You should wind up with five groups of three polygons selected.



Edge polygons selected to form the base of a battlement

5. On the Edit Geometry rollout, set Extrude to **8.0**.


The faces are extruded and form the rook's battlement.

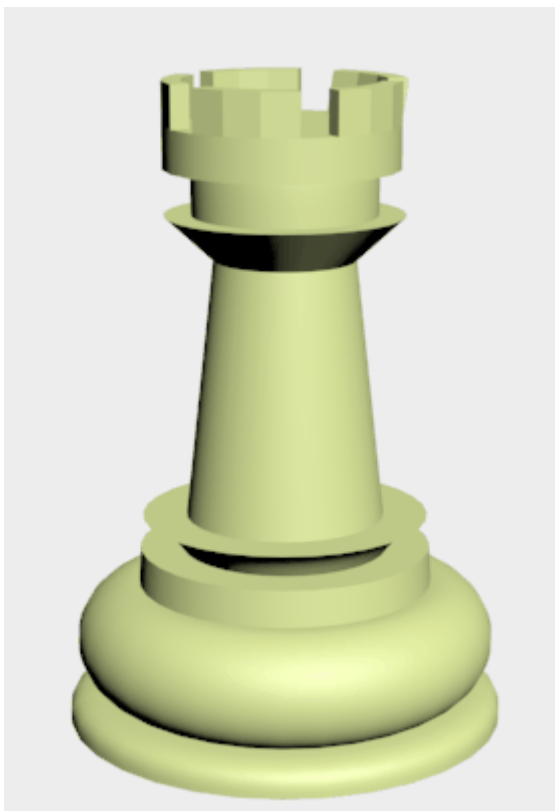


The battlement is formed of extruded faces.

6. Click Editable Mesh in the modifier stack display to exit the Polygon sub-object level.
7. In the name field, rename the cylinder **Rook Top**.



Combine the two pieces of the rook:

1.  Go to the Create panel, Geometry section. Choose Compound Objects from the drop-down list.
2. Make sure the Rook Top object is selected.
3. Click Boolean.
The Boolean compound object is a way to combine two objects into one. The two components of the boolean are called operands.
4. On the Pick Boolean rollout, click Pick Operand B, and then pick the Rook Base object.
The base disappears!
Subtraction is the default Boolean operation. In this case, it is not what you want.
5. On the Parameters rollout, in the Operation group, change the type of operation from Subtraction (A-B) to Union.



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.

Consolidate your work:

1.  Select the Boolean object that combines the base and top of the rook.
2.  Go to the Modify panel, and in the Name field, rename the object **Rook**.
3. Right-click the rook object, and from the Transform (lower-right) quadrant of the quad menu, chose Convert To > Convert To Editable Mesh.

Compound objects such as Boolean and modifiers such as Lathe add complexity to your scene, and consume system resources. Once geometry has the form you want, converting it to an editable mesh can save system resources and make the scene more efficient.

Incidentally, the reason we did not convert the pawn to an editable mesh, was that we used a portion of the pawn’s outline curve to create the base for the rook and other chessmen.

4. Choose File > Save.

Summary

In this tutorial you learned to create new geometry using face extrusion, and to use the align tool to align objects. You also learned to add objects together using Boolean compound objects.

Next

[Modeling a Bishop](#)

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