

Goals

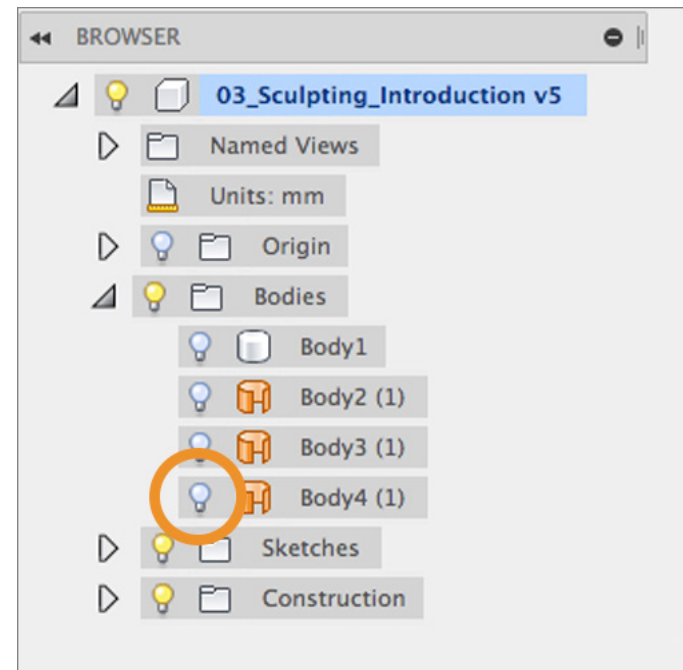
Learn how to move, rotate and scale T-Spline geometry with Edit Form.

1. Move, Rotate and Scale T-Spline geometry with Edit Form
2. Add geometry to a T-Spline body with Edit Form
3. Change the display mode
4. Insert Edges

Instructions

Step 1: Turn off the visibility of the Loft body

1. Turn off visibility of the previously created Body 4 (1) from the last lesson.
2. Turn off visibility for any visible sketches.

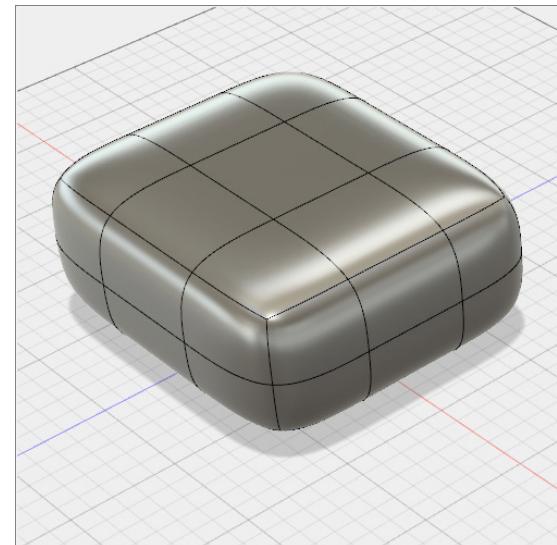
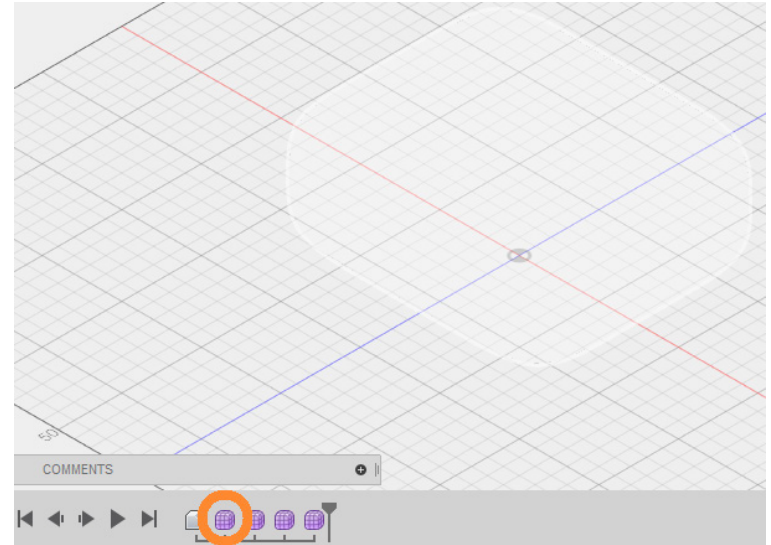


Instructions (continued)

Step 2: Edit the T-Spline shape in the Timeline

1. In the parametric timeline at the bottom of the Model window, located the 4 T-Spline form icons.
2. Hover your pointer over the first form icon and you will notice that the primitive box is highlighted on the screen.
3. Right-click on the form icon in the timeline and select Edit.

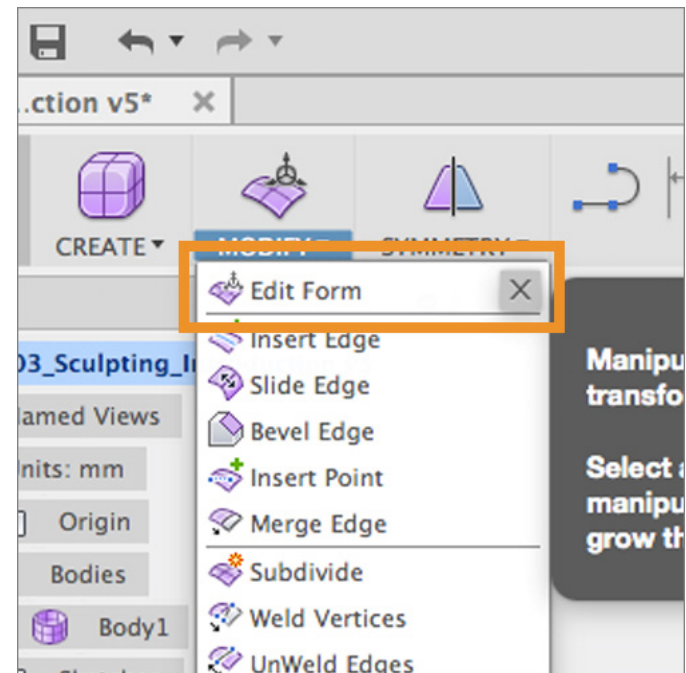
Note: When using Fusion 360 with history turned on, T-Spline operations do not have history in the same way that the operations in the Model and Patch workspaces do. However you can go back in history and make adjustments to your T-Spline shapes and those changes will be recomputed in the history of your model when you exit the Sculpt workspace.



Instructions (continued)

Step 3: Start the Edit Form command

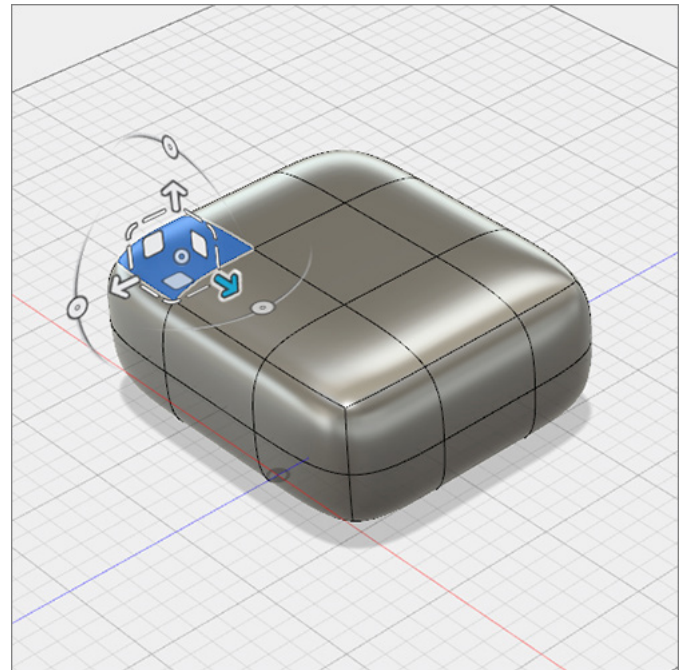
1. Click Modify > Edit Form. The Edit Form command can be used to directly manipulate Faces, Edges, and Vertices.



Instructions (continued)

2. Click on a top face located at one of the corners of the box.
3. The manipulator displays on the face with an assortment of tools.

Note: Directly manipulating a face creates the greatest changes in your form, while manipulating a single vertex will result in smaller changes.

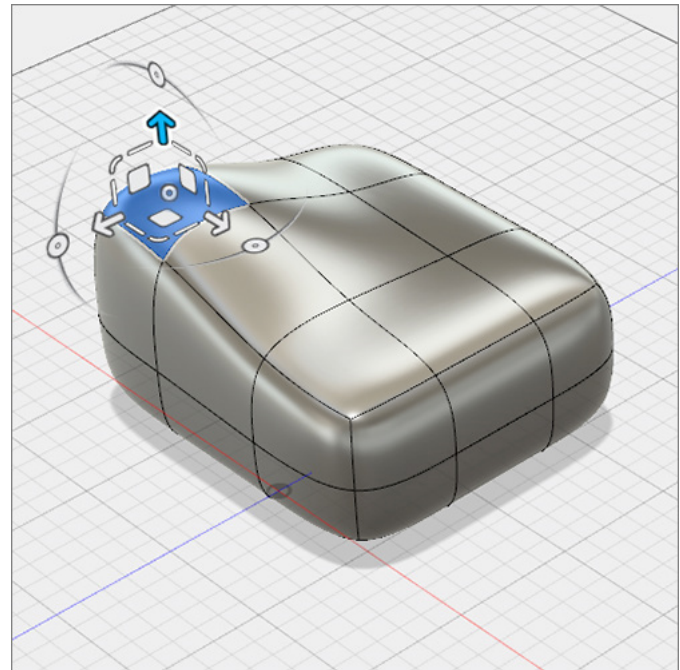


Instructions (continued)

Step 4: Move a face in a single axis direction

1. Click and drag on the arrow pointing up to translate (move) the selected face up by 30 mm.

Note: When you move a face on a surface the surrounding faces move to maintain continuity.

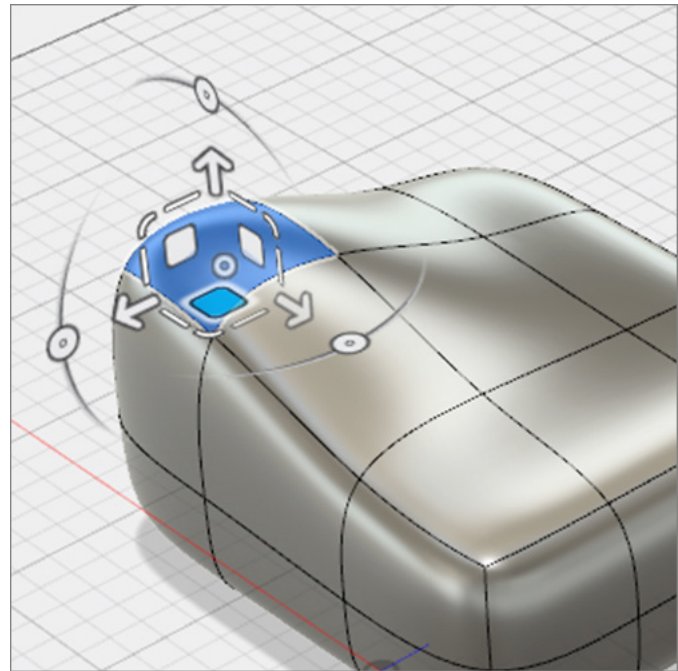


Instructions (continued)

Step 5: Move a face in a planar direction

1. Click and drag on one of the white squares to translate the selected face on a plane parallel to a given plane in world space.

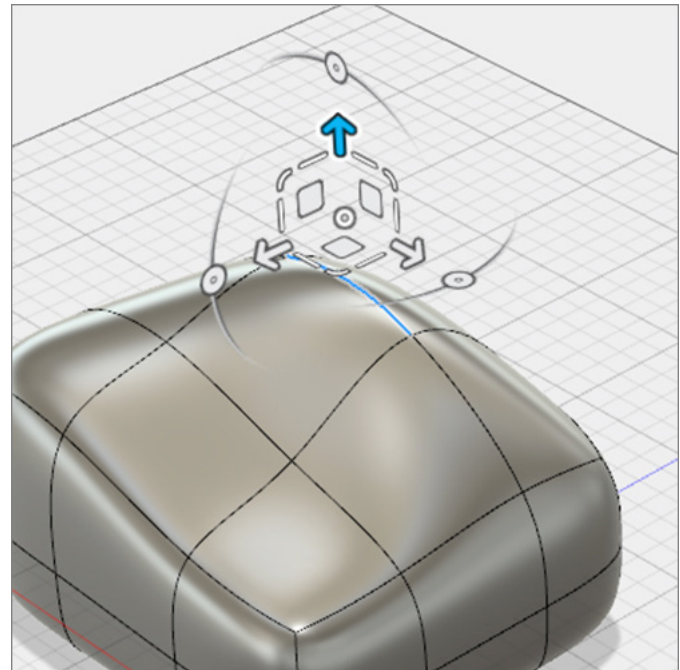
Note: By default the Edit Form manipulator uses the World Space coordinates, you can also use View space (based on the camera view) and Local space (based on the normal direction of the surface). These can be changed in the Coordinate options in Edit Form.



Instructions (continued)

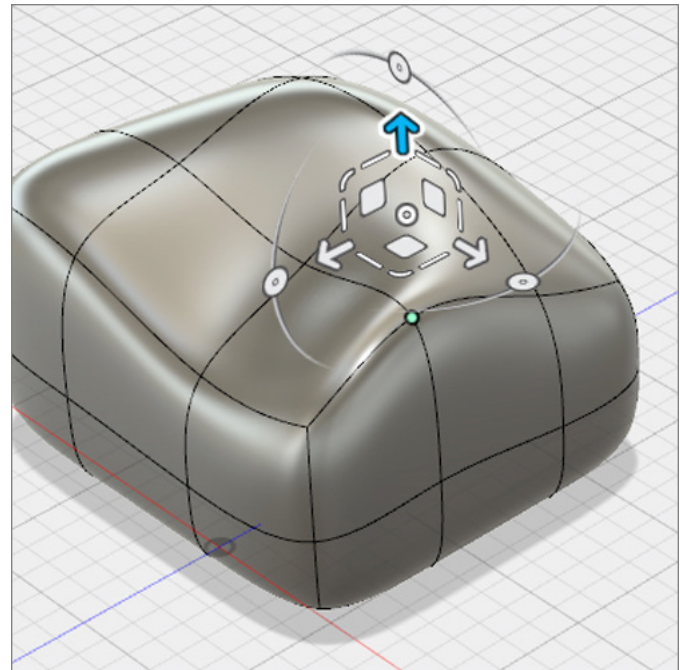
Step 6: Move a T-Spline edge and vertex

1. Select a single edge.
2. Use any of the translate manipulators to compare the effect.



Instructions (continued)

3. Select a single vertex.
4. Translate this vertex to see how this creates more subtle changes.

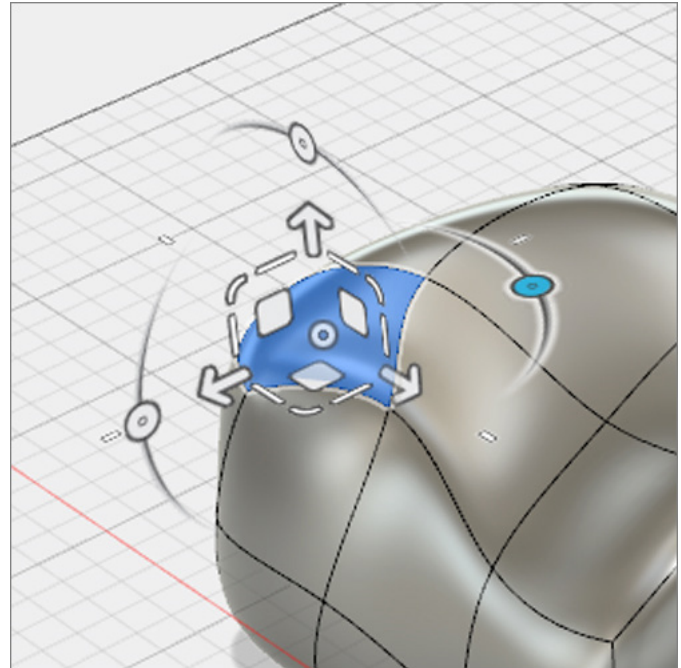


Instructions (continued)

Step 7: Rotation with Edit Form

1. Make sure that at least one face is selected.
2. Click and drag one of the circular arcs to rotate the selected geometry about a single axis.

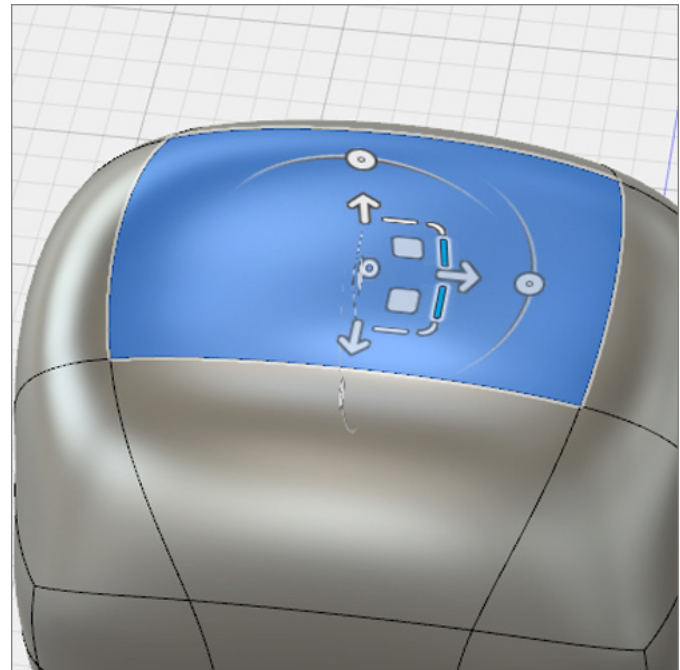
Note: Be careful not to rotate geometry too far, as self-intersecting faces, or geometry that twists through itself will result in not being able to convert it in to a solid body.



Instructions (continued)

Step 8: Single direction scaling

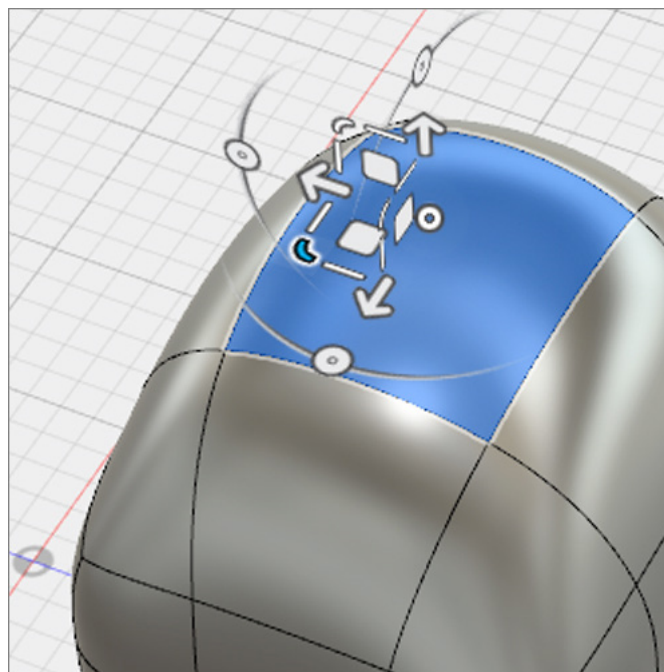
1. Make sure that at least one face is selected.
2. Click and drag one of the straight lines to scale the selected face in one direction.



Instructions (continued)

Step 9: Planar scaling

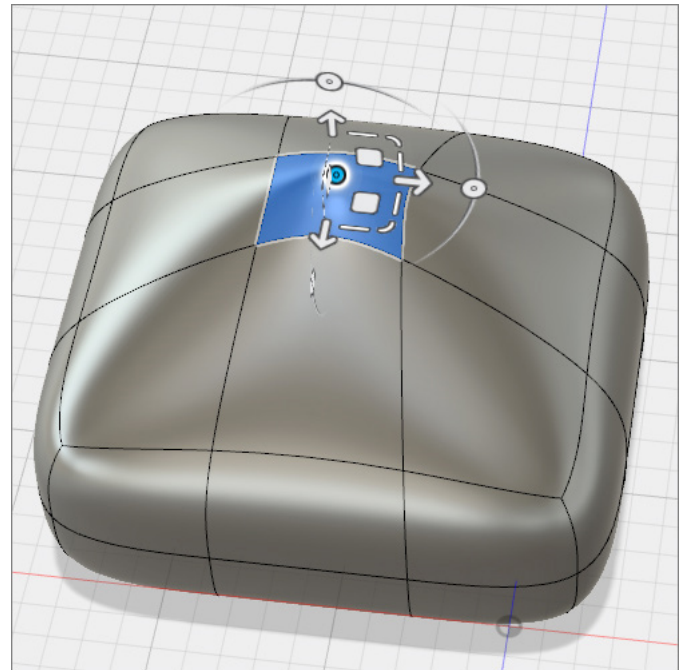
1. Make sure that at least one face is selected.
2. Click and drag one of the small corner manipulators to scale the selected face along a plane - or in two directions.



Instructions (continued)

Step 10: Universal scaling

1. Make sure that at least one face is selected.
2. Click and drag the circular manipulator at the center of the manipulator.
3. Dragging left or right will scale the geometry in all directions up or down.

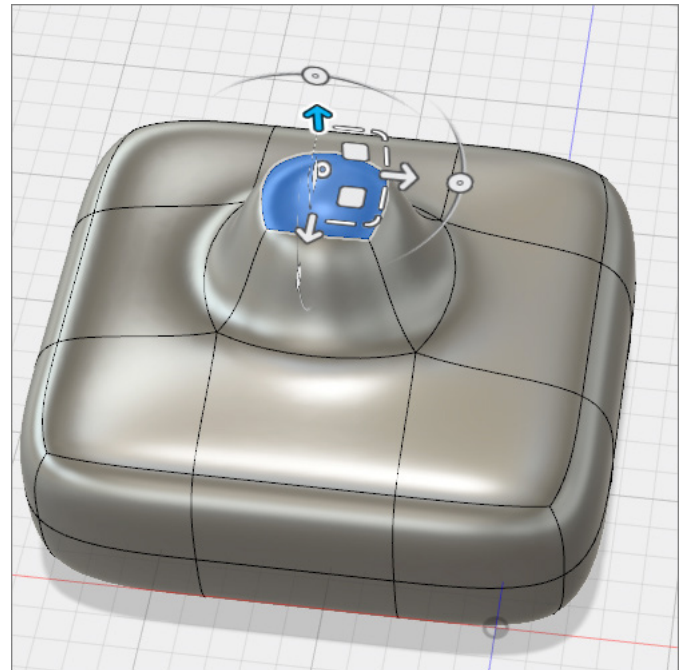


Instructions (continued)

Step 11: Extrude a face to add geometry

1. Select a single face of your T-Spline form.
2. With the Edit Form command still active, hold the alt-option on Mac or alt key on Windows.
3. Click and drag the single arrow to add geometry outward from the selected face.
4. Let go of the alt-option/alt key as well as the left-mouse button.
5. Select OK to close Edit Form .

Note: You can use this hotkey function to extrude any edge(s) or face(s) that are selected on a T-Spline form.

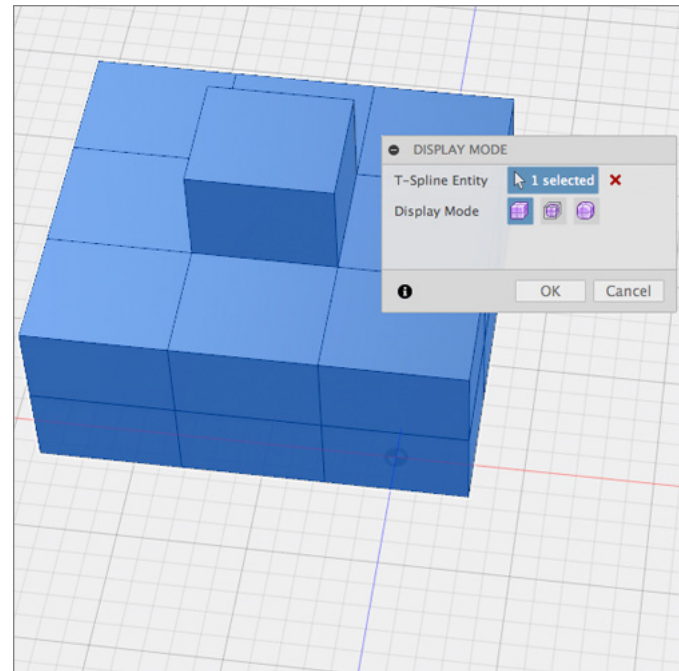


Instructions (continued)

Step 12: Change display mode

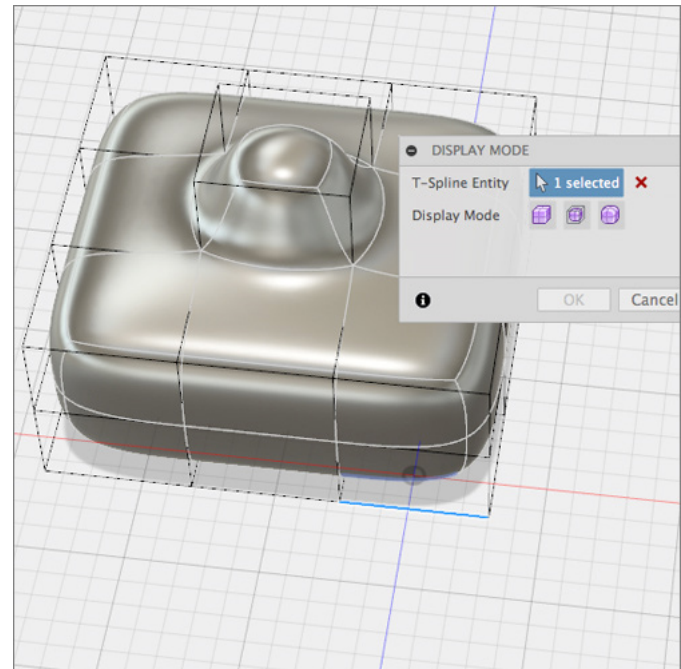
When modeling with T-Splines you have 3 different display modes to choose from. Changing the display mode can help you find problem areas on your model and increase performance by not having to constantly smooth the T-Spline shape. For this example we will switch the display to Box Mode - a polygon version of the T-Spline form.

1. Select Modify > Performance > Display Mode to bring up the Display Mode window.
2. In the Display Mode window select Display Mode > Box Display to show an unsmoothed version of the T-Spline form.



Instructions (continued)

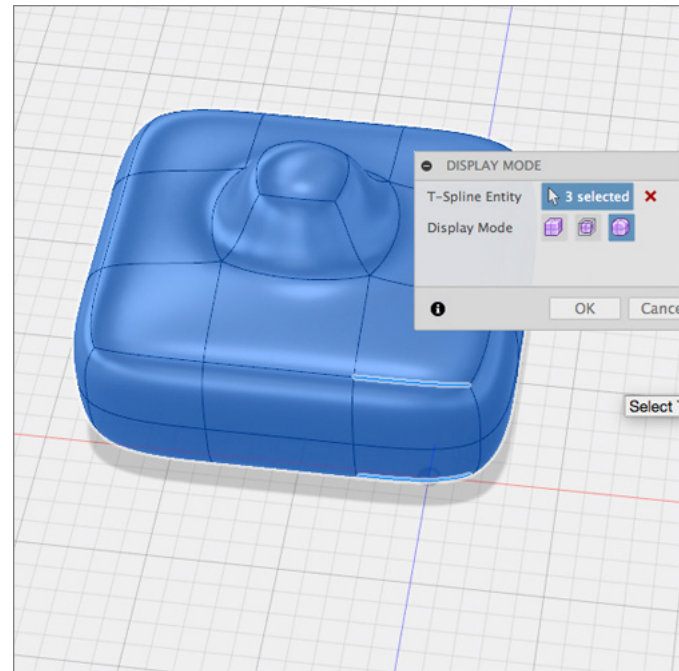
3. Select Display Mode > Control Frame Display to see a combination of the unsmoothed and smoothed versions of the T-Spline.



Instructions (continued)

4. Select Display Mode > Smooth Display to go back to the smoothed version.
5. Select Display Mode > Box Display
6. Select OK to close the window

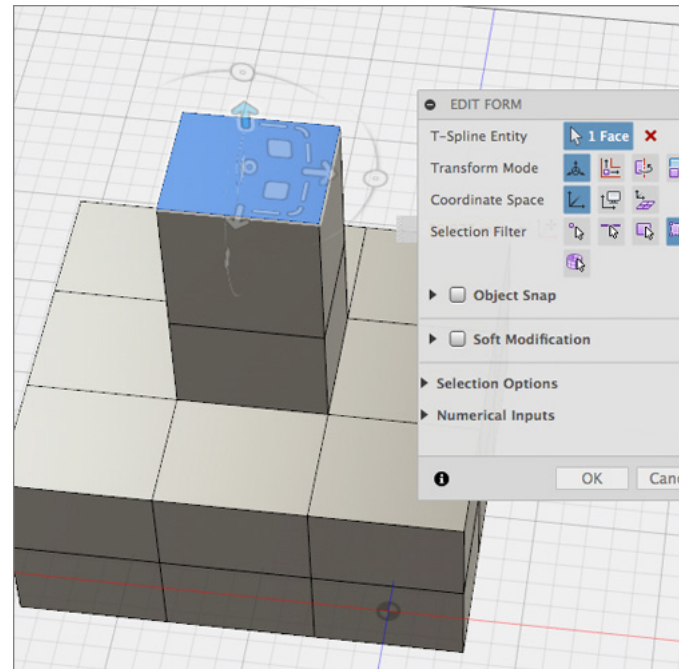
Note: Display mode can also be switched by using the combination of Control + 1 for Box, Control + 2 for Control Frame and Control + 3 for Smooth on a Mac. Or Alt + 1, Alt + 2, Alt + 3 respectively on a PC. You can also find these controls in the Selection Options section of the Edit Form window.



Instructions (continued)

Step 13: Working in Box Display Mode

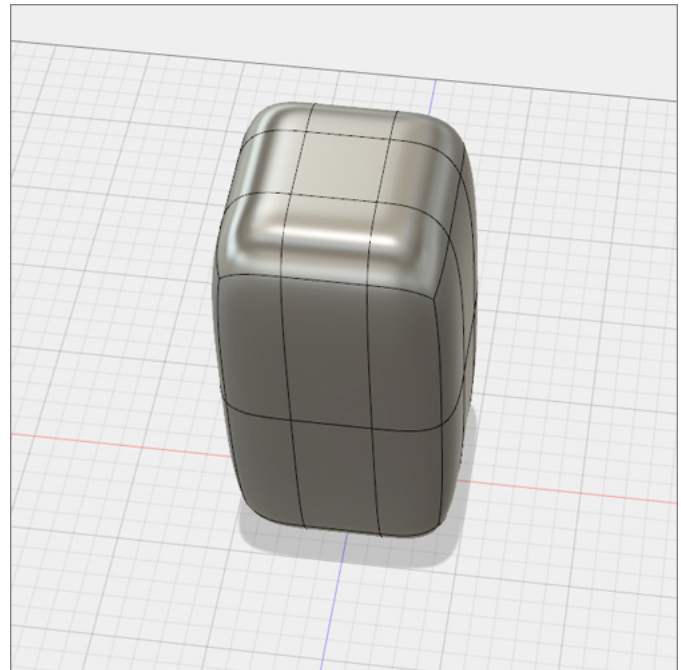
1. Hold down the right mouse button to bring up the radial menu.
2. Select Edit Form in the radial menu.
3. Select a face and hold alt-option/alt while dragging the blue arrow up to extrude the face. You will notice that the performance is faster in Box mode than in Smooth mode.
4. Hold control/alt +3 to return to smooth mode.
5. Hold down the right mouse button and select OK from the radial menu to close the Edit Form window.
6. Select Finish Form from the menu bar to go back to the Model workspace.



Instructions (continued)

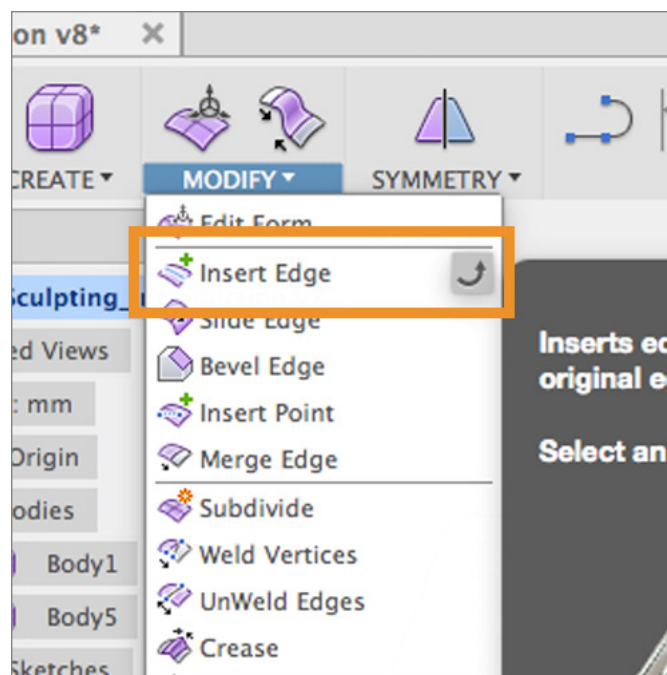
Step 14: Add edges to a T-Spline form

1. Enter the Sculpt workspace by selecting Create > Create Form.
2. Create another Box primitive whose length, width, and height are 100mm, 100mm, and 200mm.
3. Set the number of length, width, and height faces equal to 4, 2, and 2.
4. Click OK.



Instructions (continued)

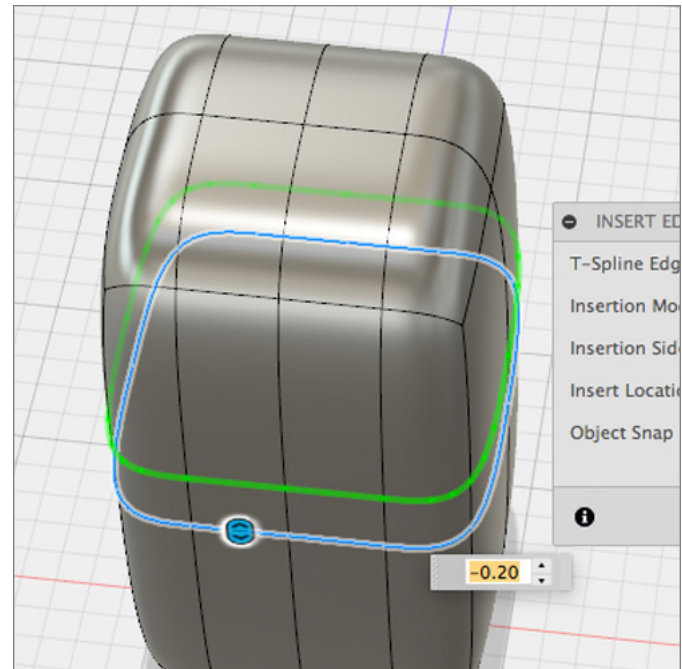
5. Click Modify > Insert Edge.



Instructions (continued)

6. Double-click on one of the middle edges to select the entire middle loop.

Note: Double clicking on an edge will select the complete edge loop. Selecting a single edge inserts an edge to a face on either side of the selected edge. Selecting an edge loop adds a second loop.

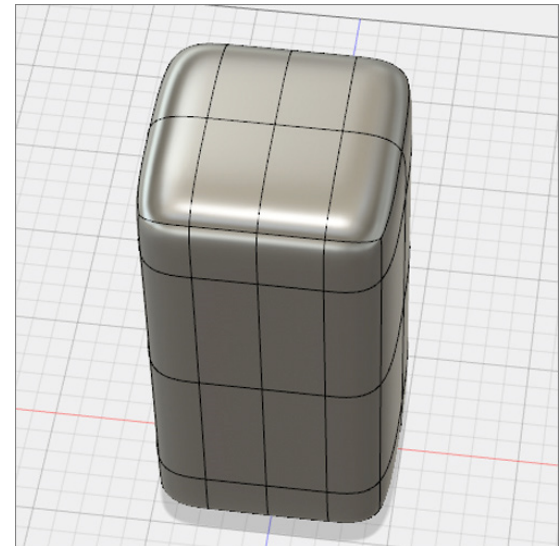
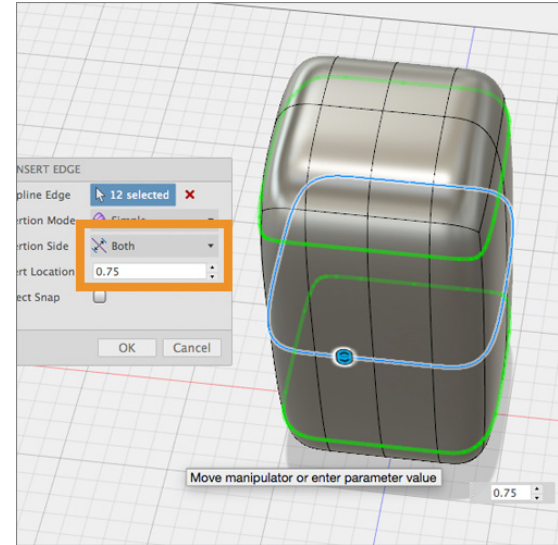


Instructions (continued)

Step 15: Adjust the insert location

1. Click and drag the double arrow to adjust the position of the inserted edge.
2. By hand, or with the text field, set the Insert Location equal to 0.75.
3. Change the Insert Side from Single to Both.
4. Click OK.

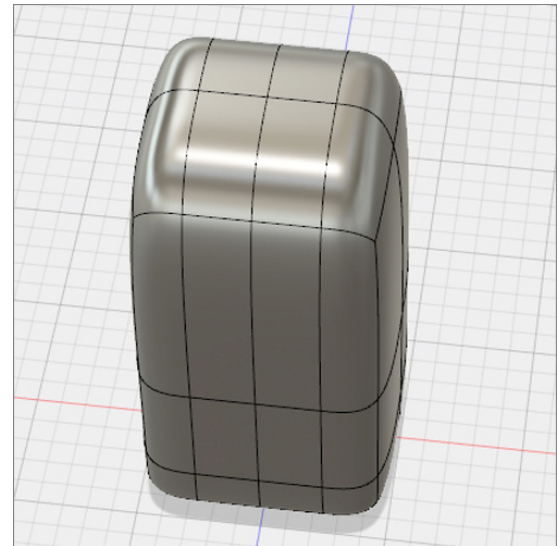
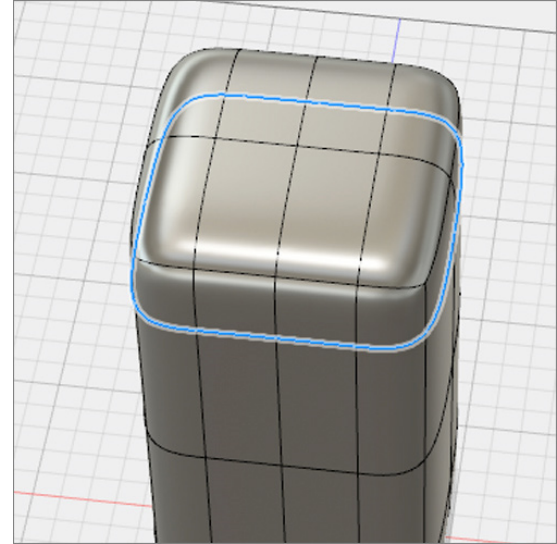
Note: You probably noticed that the shape of the T-Spline form changed after you inserted additional edges. The top and the bottom of the box became sharper by adding more edges near the existing top and bottom edges. If you want to insert an edge(s) and not change the shape of the T-Spline form, change the Insertion Mode to Exact.



Instructions (continued)

Step 16: Delete and edge

1. Select the recently added upper edge loop.
2. Select Modify > Delete or press the Delete key on your keyboard.
3. Select Finish Form.



Wrap up

Congratulations! You've learned how to modify a T-Spline Form in Fusion 360! In this lesson, you accomplished the following:

- Moved, Rotated, and Scaled T-Spline geometry with Edit Form
- Added geometry to a T-Spline body with Edit Form
- Changed the display mode
- Inserted Edges



In the next lesson, we discuss how to Create a T-Spline Form using a reference image.