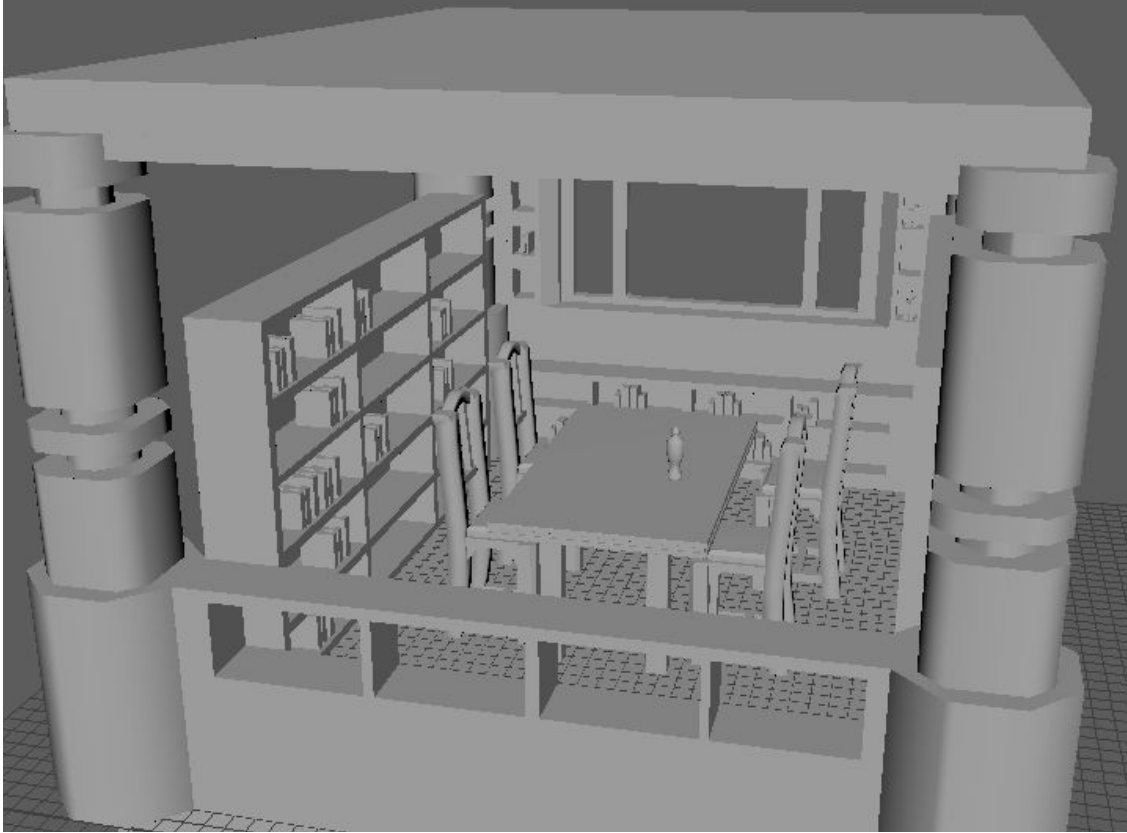


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A section of the Queens Library, University of Bristol, created using Autodesk Maya 2017 Student Edition

A Section of Queens Library

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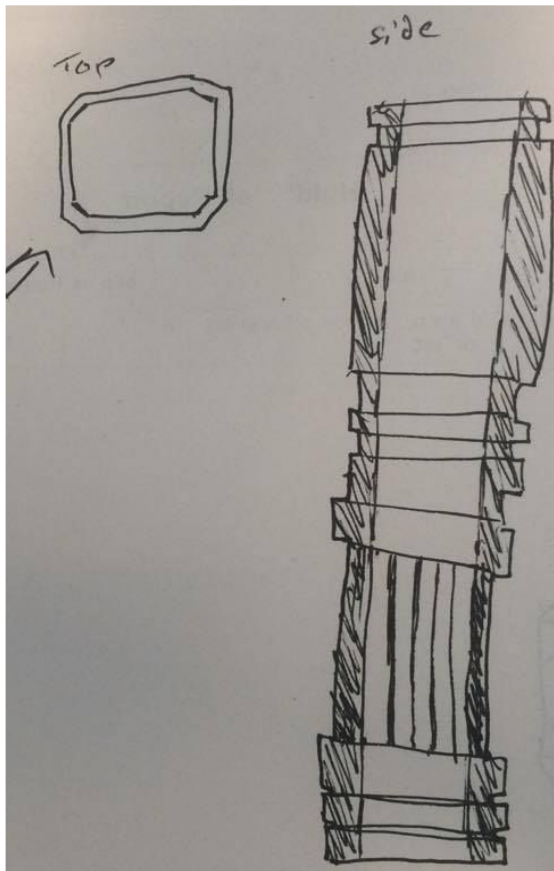
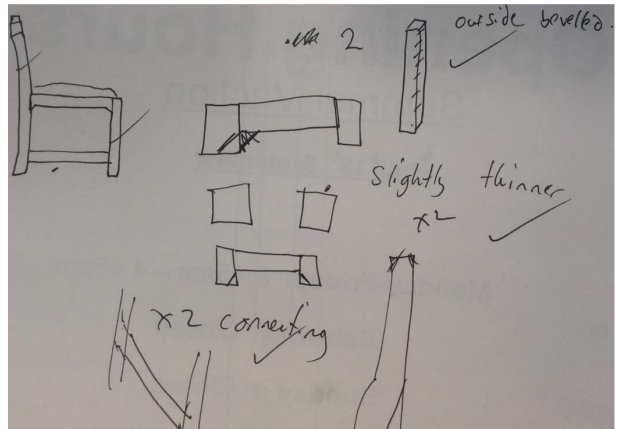
1. Pre-production and planning

The library in the Queens building on the University campus contains lots of different shapes, curves and angles. This makes it a good interior to demonstrate different modelling techniques. The library is divided up into sections, each section is visually similar, therefore only a single section is modelled to demonstrate key modelling techniques. However, the rest of the library could be constructed by duplicating, translating and rotating the below section.

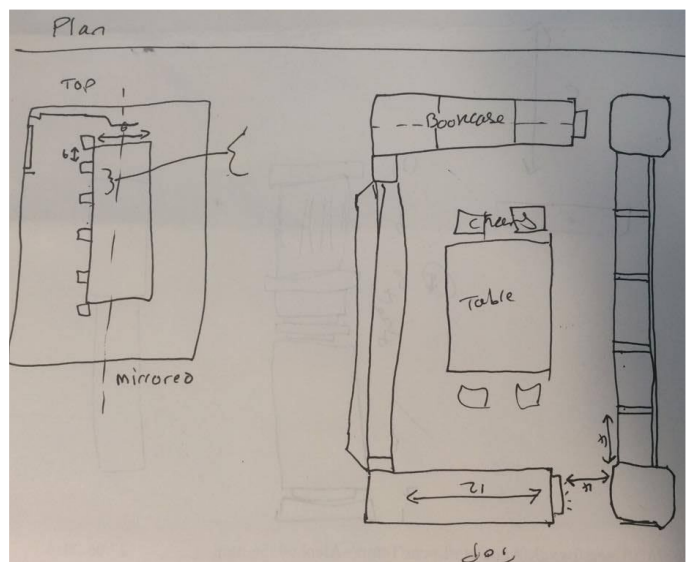


The modelled section of Queens Library

Photographs were taken of the objects in a section and the topology of how they fit together in the section. The following references images were used to create sketches of the library to try and understand how the objects could be created in Autodesk Maya.

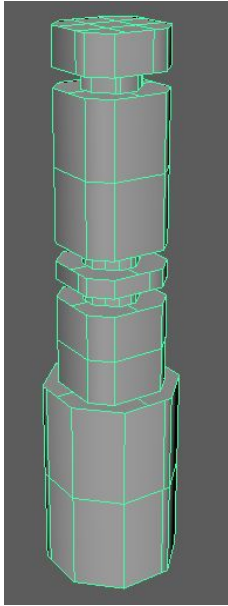
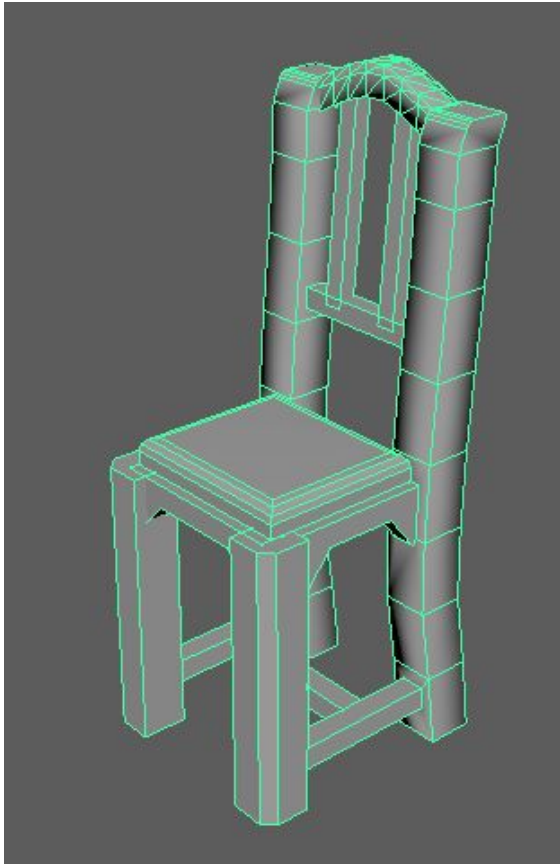


I measured the size of the pillar and based that as the scale to use for the other objects, this create realistic perspective throughout the modelling process.



2. Techniques and surfaces

A wide range of techniques were used to create the model, each object is listed below with a description of how the object was created and what different techniques were used:

Object Description	Photo
<p>Pillar</p> <p>I drew an 8 sided cylinder using the CV tool (linear), and copying the cylinder higher up I lofted the curves together to form polygons. I then created another smaller 8 sided cylinder for the smaller parts of the pillar and lofted the curves together. I then filled in the gaps of the connecting cylinders by using a planar surface. I had to reverse some surfaces when creating the planar surface so the surface was the same direction as the others..</p> <p>Techniques Used: Curve construction, planar surfaces, lofts</p>	
<p>Chair</p> <p>I created the chair in several parts:</p> <p>Long Legs: To create the 2 long legs that lead up to the back of the chair, I created a NURBS square, and drew a CV curve to the top of the chair and extruded the square along the curve to create a curved oblong (as polygons). I then combined the parts together to create a complete shape and tidied up the shape by selecting some edges and removing them to create nice flowing polygons. The top of these legs were filled and vertexes were deleted to tidy up the shape. I then used the mesh bevel tool to create a smooth edge at the top of the chair leg.</p> <p>Short Legs: I created a polygon cube, increased the height to create an oblong and used the mesh bevel tool on one edge to create a worn down effect.</p>	

Bottom connecting legs: I created several polygon oblongs, moving them into position and overlapping both the front and back legs. To smooth up the polygons I divided the front leg inner face into sections then performed a boolean union to merge the polygons together to create better flowing polygons.

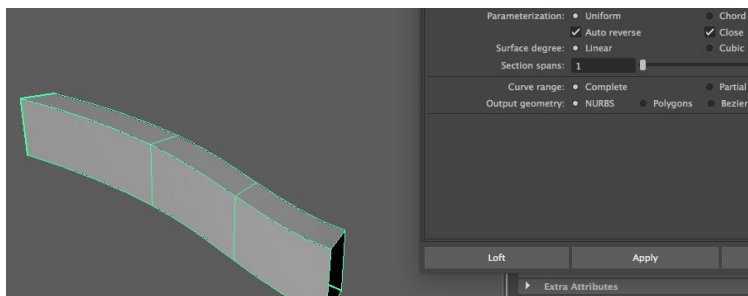
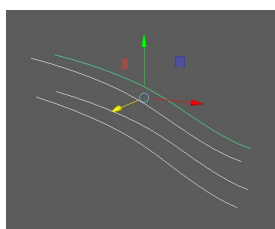
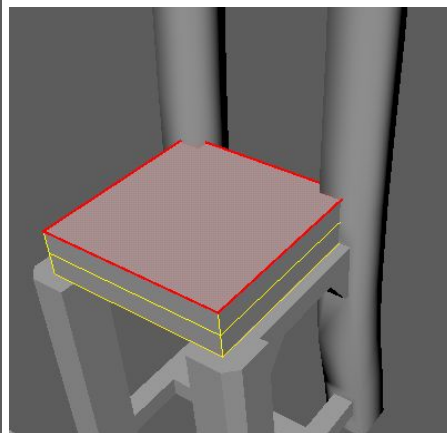
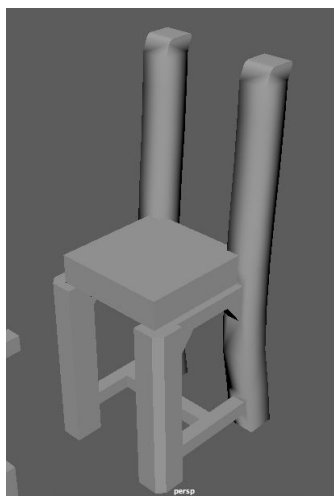
Cushion on the chair: A thin polygon was split into 2 sub divisions, then the upper division was mesh bevelled to create a cushion.

Upper back detail: To create the flowing back, I create an EP curve, smoothed it out, duplicated it, then lofted it out to create a nice flowing shape.

Connecting back pieces: I created 3 polygonal cubes and performed a boolean union operation and bevelled each side to create the similar rounded edge effect.

Techniques Used:

Curve construction, polygonal sculpting, bevels, booleans, lofts.

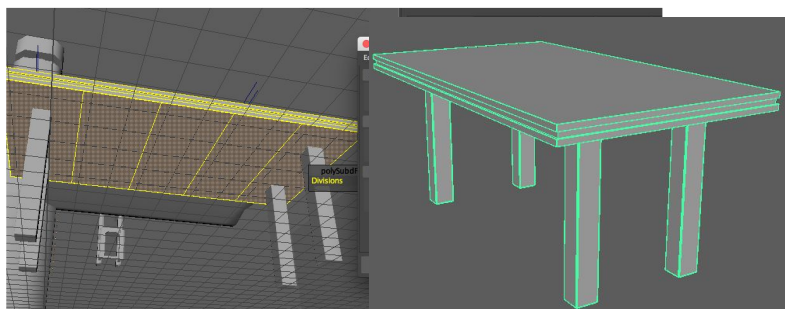


Table

After several difficulties (detailed in section 3) I created several wide polygons, bevelled the edges and divided the bottom up into divisions so the polygons connecting the legs have a smoother fit.

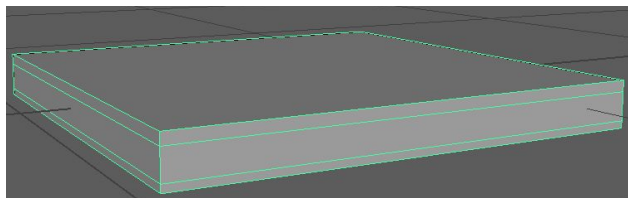
Techniques Used:

Polygonal sculpting, bevels, booleans.



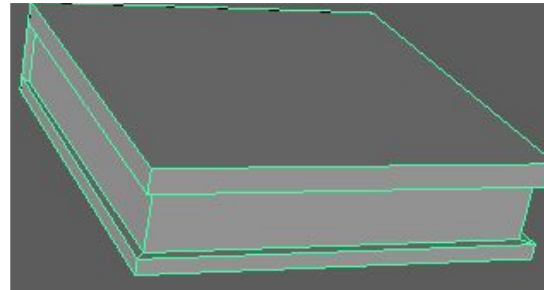
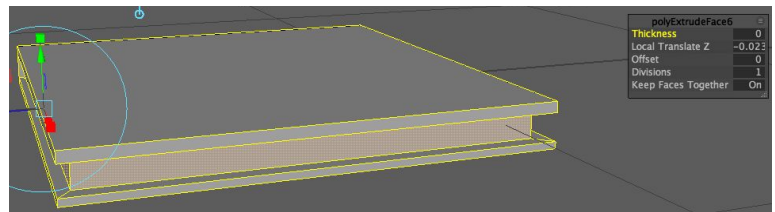
Book

Edge loops were added to a polygon to create the cover of the book. The inner part was extruded inwards to create the pages and a realistic book effect.



Techniques Used:

Polygonal sculpting, extruded surfaces.

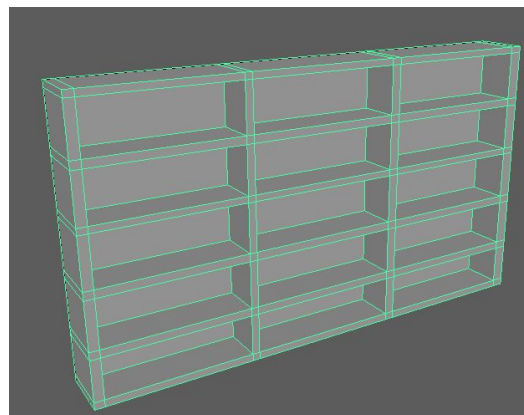
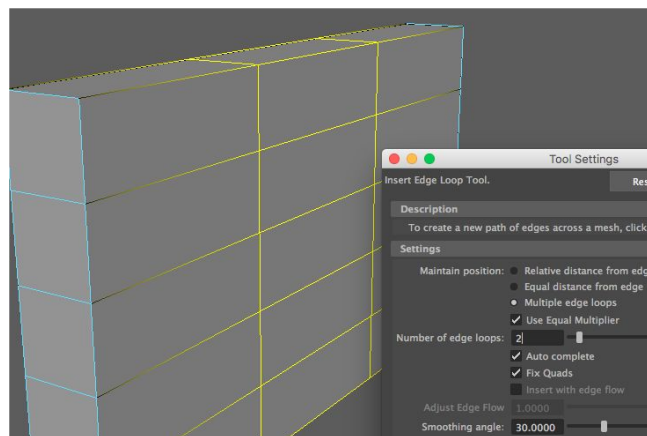


Left/Right Bookcases

The bookcases were difficult to construct, however, the opted method was to divide up a polygon shape into sections with the edges of the bookshelves. Then the inner parts were extruded inwards, similar to how the book was made.

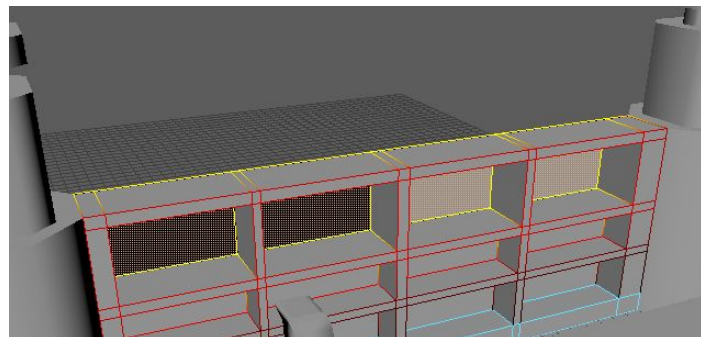
Techniques Used:

Polygonal sculpting, extruded surfaces.



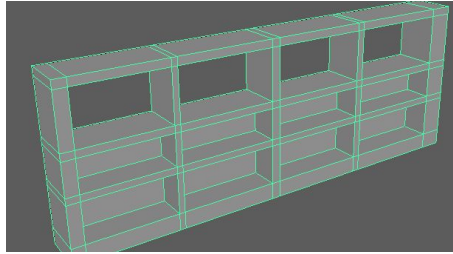
Balcony Bookcase

The balcony bookcase was created in a similar way to the other bookcases, however, the top shelf was extruded all the way through to the other side and the faces were deleted on both sides to create a gap for the balcony bookcase.



Techniques Used:

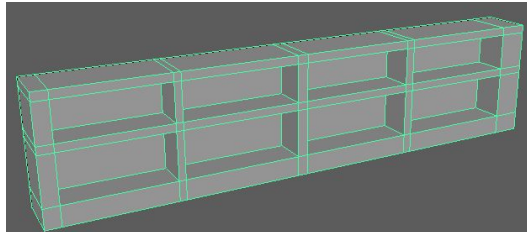
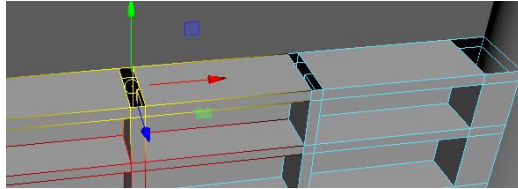
Polygonal sculpting, extruded surfaces.

**Window Bookcase**

This was based from the balcony bookcase with the top edges deleted and a mesh fill hole technique was used to fill everything.

Techniques Used:

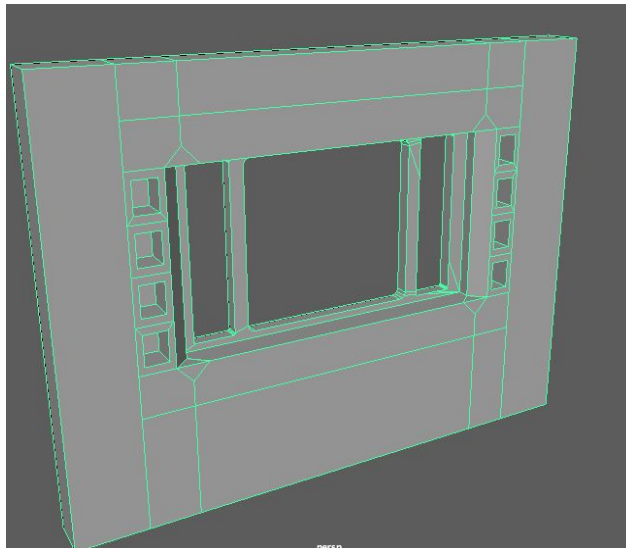
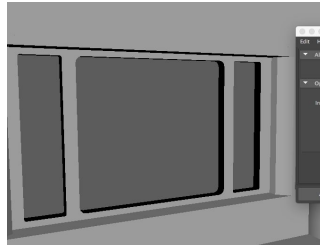
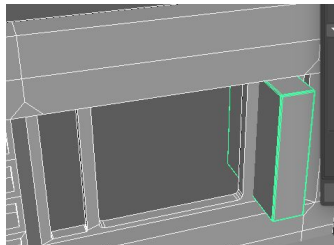
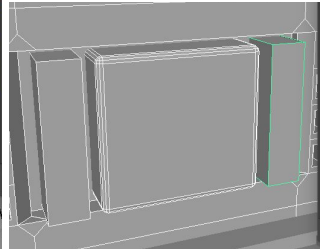
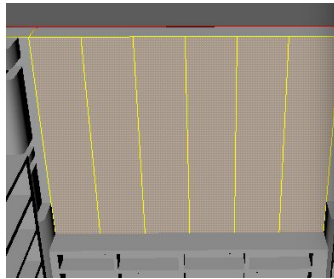
Polygonal sculpting.

**Window**

The window used a previous technique to divide up the surface into sections by adding edge loops. Part of the window was extruded and the sides bevelled to create the angle leading to the window glass. The glass was tricky, I beveled some spheres and boolean differenced them when they were half inside the glass to create a smooth angle for the windows.

Techniques Used:

Polygonal sculpting, extruded surfaces, bevels, booleans.

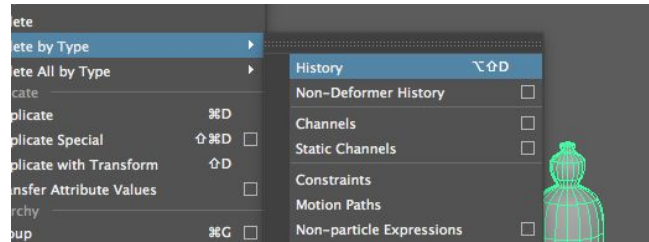
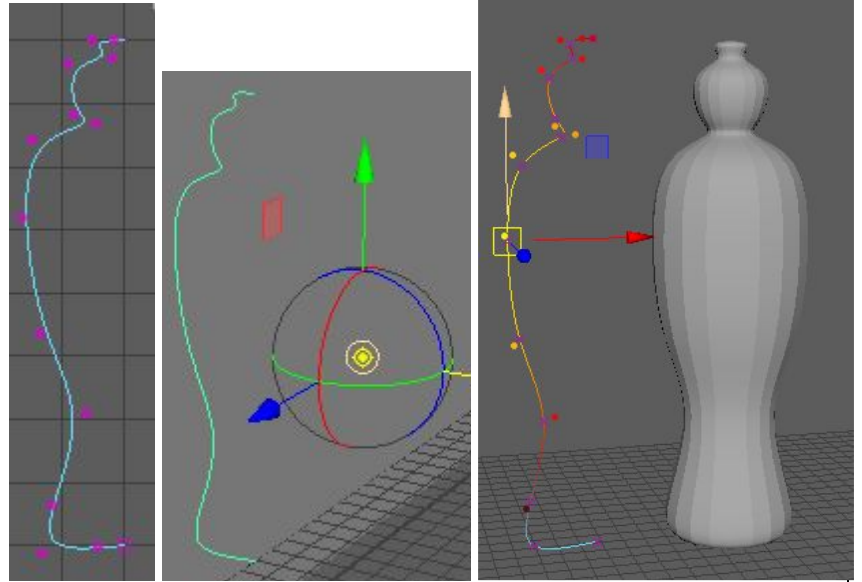


Water Bottle

This was a tricky object to create. I used the EP curve tool to create a curve, moving the curve points to create a good shape and moved the pivot point outwards from the curve, then used a revolve around the Y axis to create a realistic water bottle. I edited the curve points after the revolve to tweak the shape. When I was satisfied I created polygons and delete the history of the object.

Techniques Used:

Curve construction, revolves, pivot realignment.

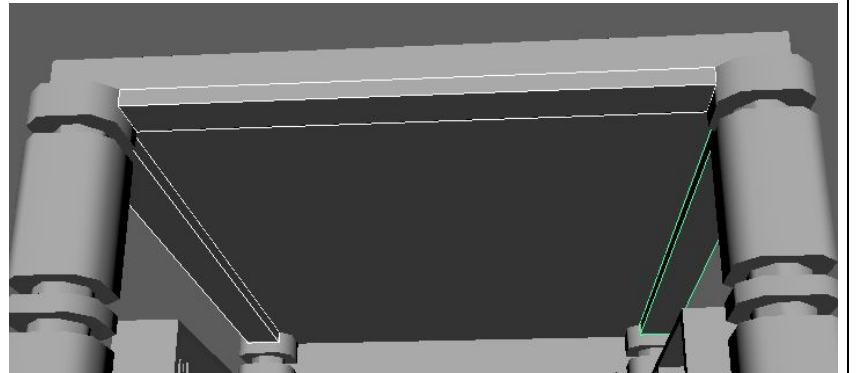


Roof

For the roof sections, I changed the pivot location so it aligned with the pillars and combined them together to create a single object.

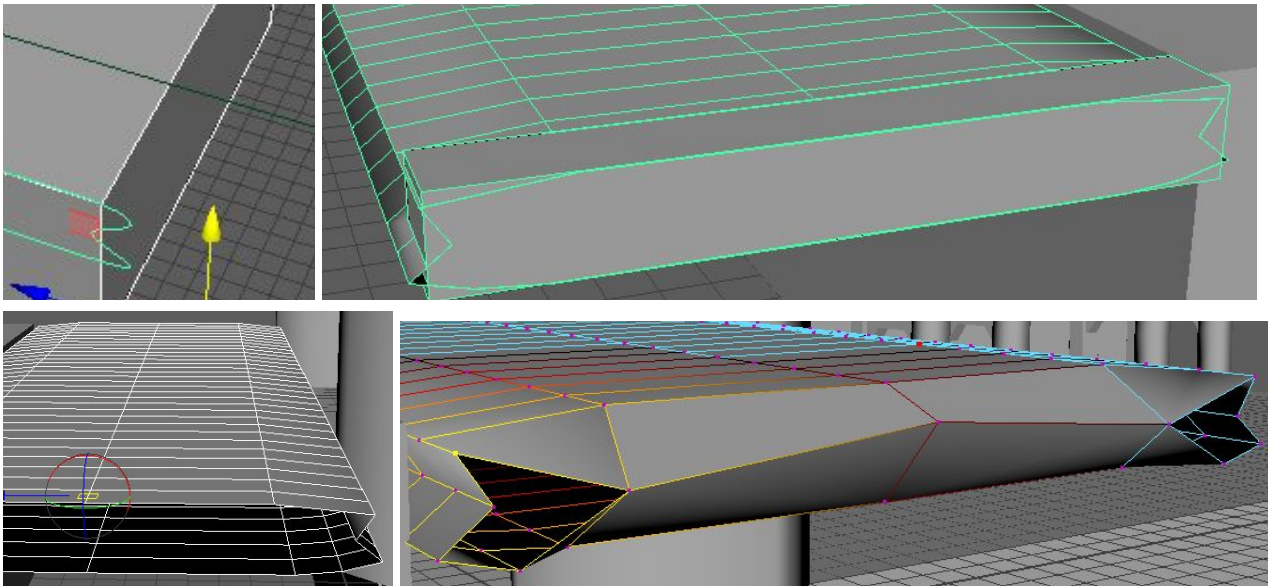
Techniques Used:

Polygonal sculpting.



3. Process and discussion

The process started by taking photographs and sketching the different objects to try and understand more about how they could be created in Autodesk Maya. The objects could be created in multiple ways, so I had to think carefully about the best techniques to use. For example, when creating the table, I thought it would be good to use the EP curve tool to create a good flowing edge to the table. I started by drawing a curve and lofting it to create half a table. This was a easy and fast technique to create a nice flowing table with a smooth edge, however, when I wanted to tidy up the corners of the table I had lots of vertices and edges and it was difficult to join them together and join them up. Therefore I tried another method by creating multiple polygon cubes and created several bevels rather than using a lofted curve. This was easier to manipulate and took less time, however it didn't produce a more realistic effect than the lofted curve.



Photos showing the difficulties with the lofted table approach

In another example when I created the balcony window, I had to think outside the box to create realistic windowpane edges. I studied my initial sketches and images to try and think of different solutions to create the curved window panes. I observed that the window pane edges were slightly bevelled and I was happy that I knew what technique to create that effect. I created a thin, flat polygon and several cubes to act as my glass. The edges on these cubes would represent the edges on the glass pane. I bevelled the edges of these cubes and performed a boolean difference, being careful to select the cubes and the glass in the correct order, and created very realistic edges.