

Polygon Modelling 2

In this lesson, you will learn how to use polygon modelling tools to help you assemble and fix a low polygon Boar model.



Poly2|Contents

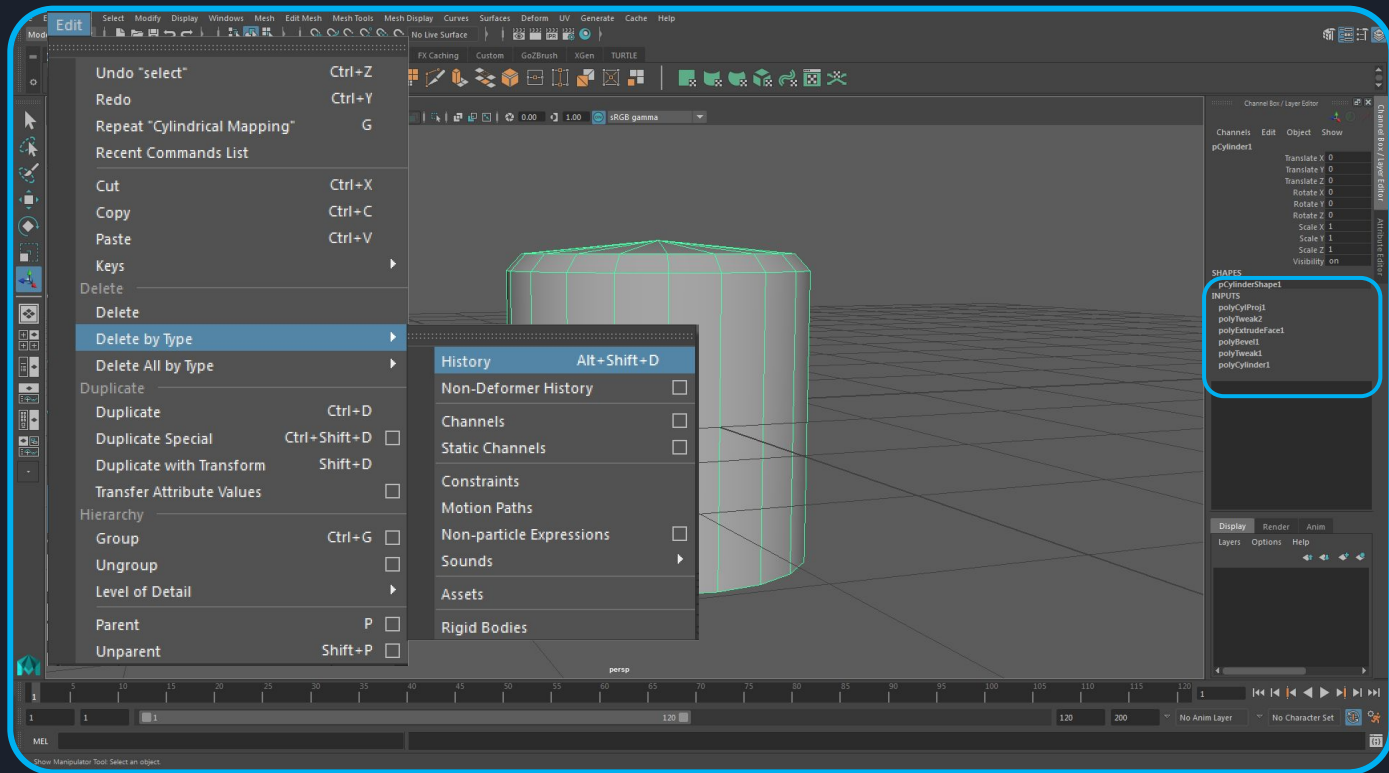


This lesson will introduce you to some important modelling tools and processes that will allow you to make complex models.

Topics will be:

1. History
2. Polygon Count HUD
3. Separate and combine
4. Merge Vertices
5. Collapse Edge
6. Ctrl Delete Edge
7. Mirror
8. Negative Scale Mirror
9. Symmetry

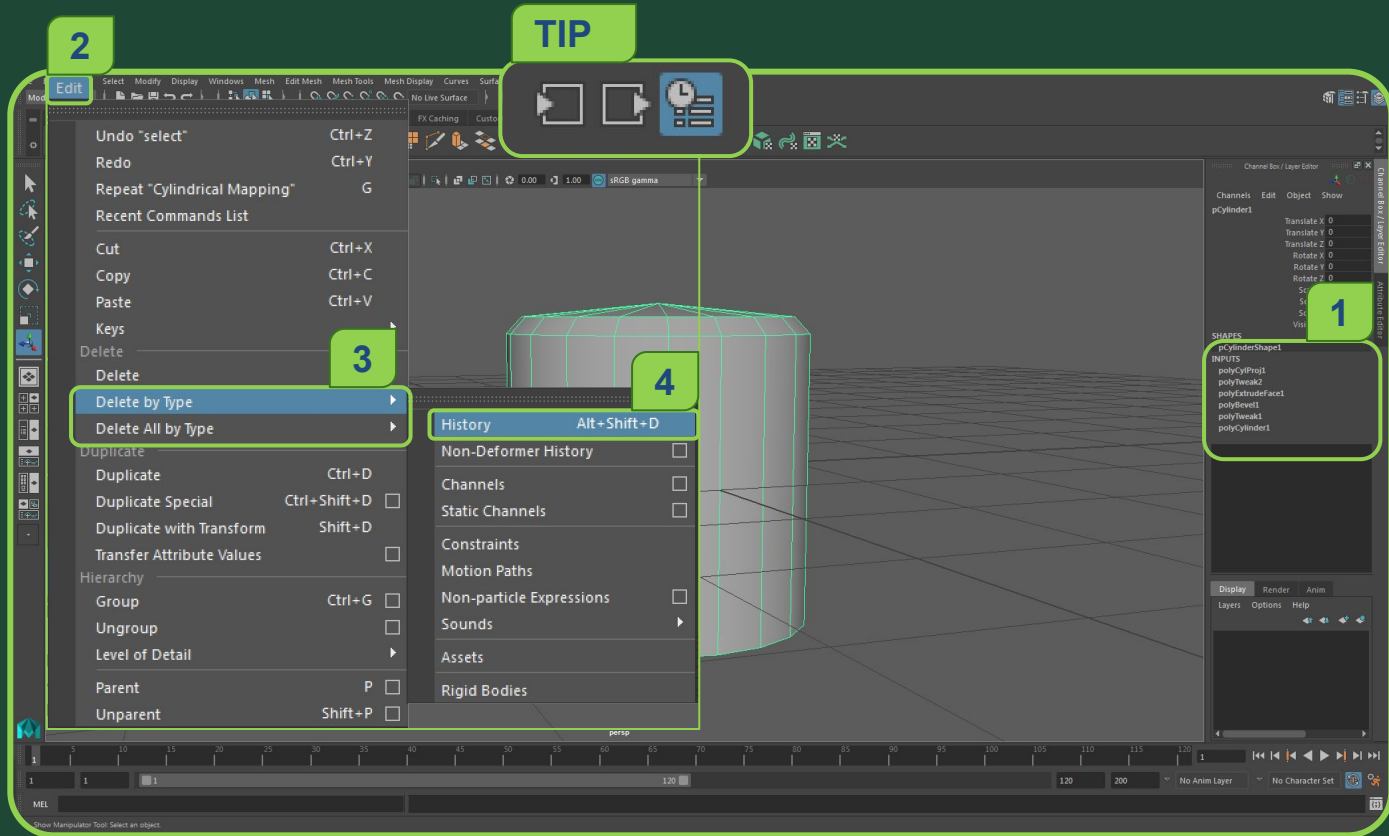
Poly2|History



Maya creates a node for all major edits to an object, this is referred to as history.

- Allows you to make some adjustments to earlier actions.
- Can cause instability as the list begins to grow.
- It's a good idea to delete history regularly.

Poly2|History



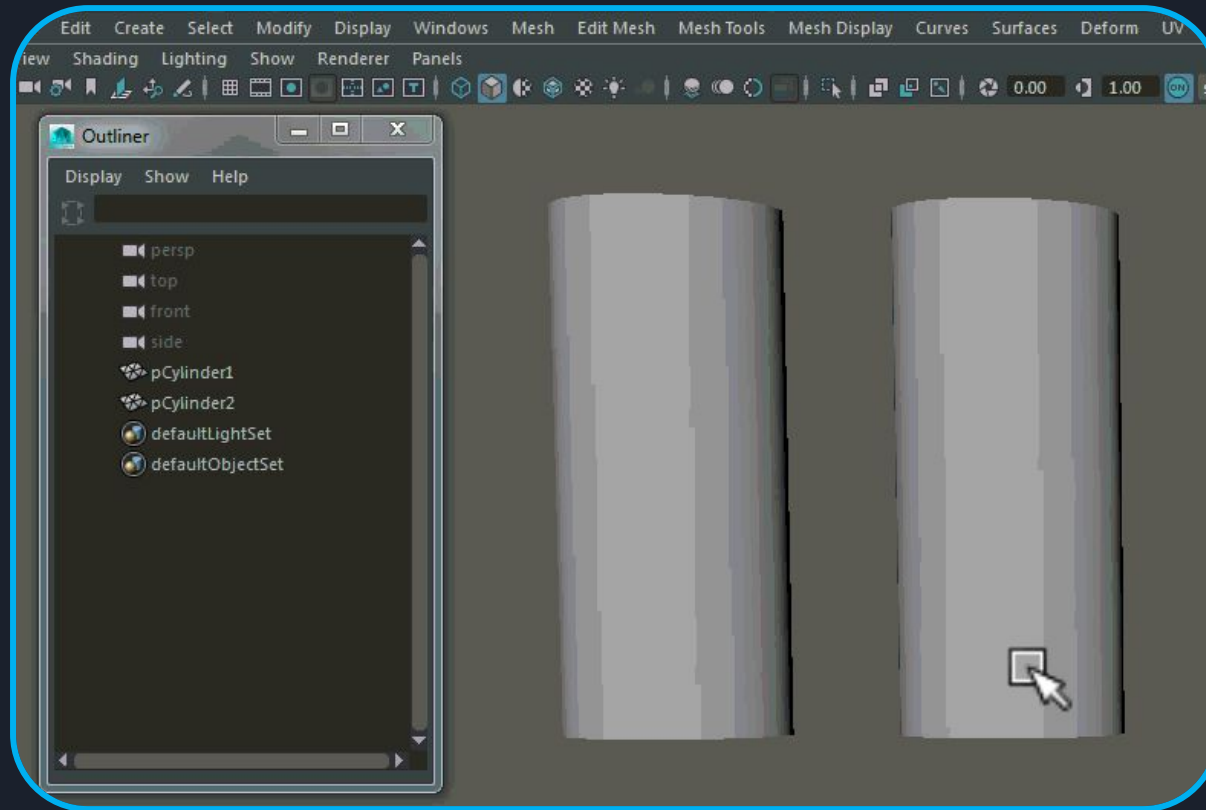
1. You can see the history list in the Channel box under Inputs heading.
2. Select Edit
3. Select Delete by type

(Delete All by type will do this to all objects in the scene.)

1. Click on History in the list. The Inputs list will be cleared.

TIP: You can toggle history on or off by clicking the history button in the status line. This will stop Maya from creating history.

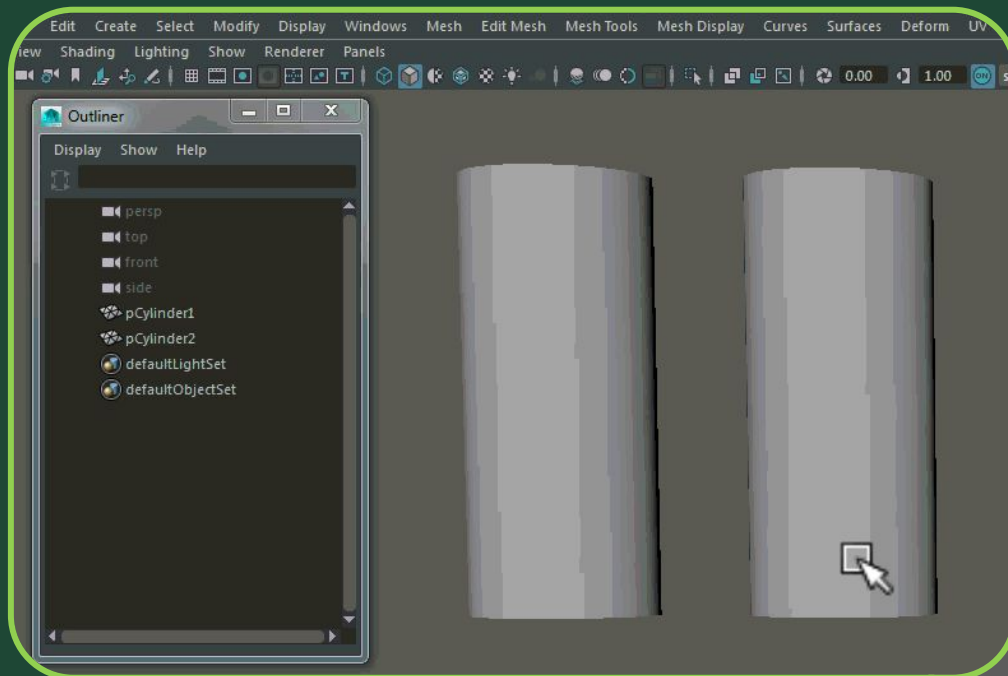
Poly2|Combine and Separate



Multiple objects can be combined to form one object and separated back to individual objects.

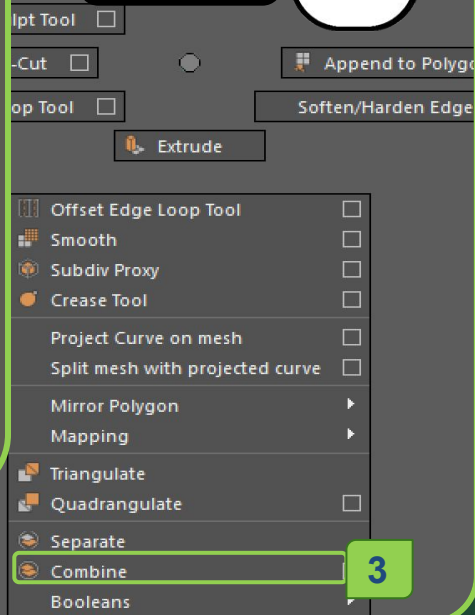
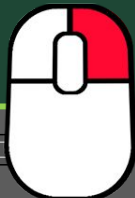
- Combining can be helpful if you are building separate parts of a model that eventually need to be one object.
- Separating, allows you to break the combined object back into separate objects.

Poly2|Combine



Delete history after combining

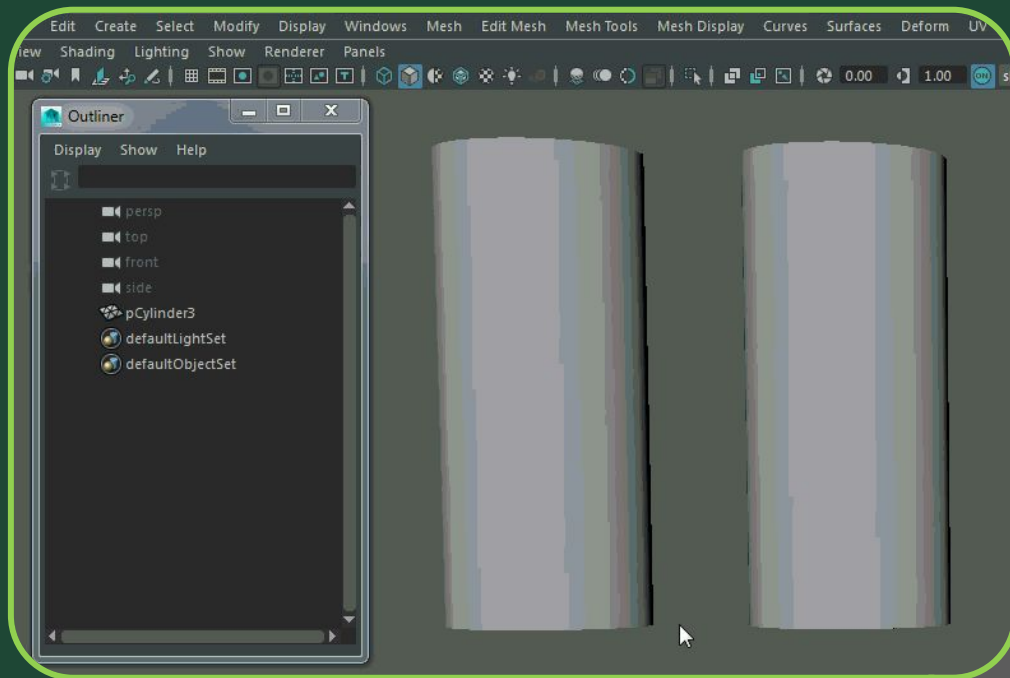
Shift



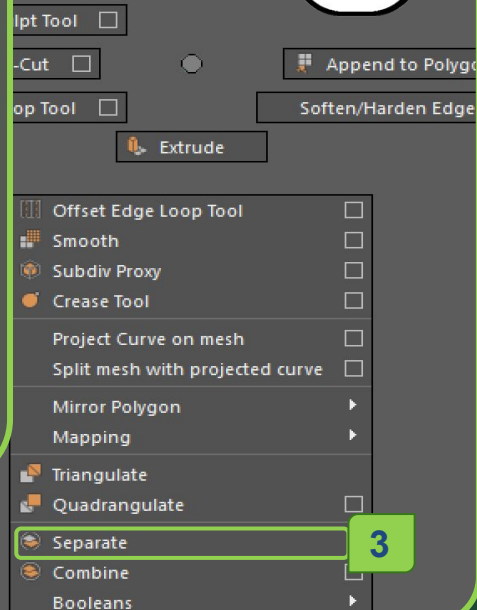
COMBINE

1. Select two or more objects in the viewport or outliner.
2. Hold down Shift and right click.
3. Select Combine from the marking menu.

Poly2|Separate



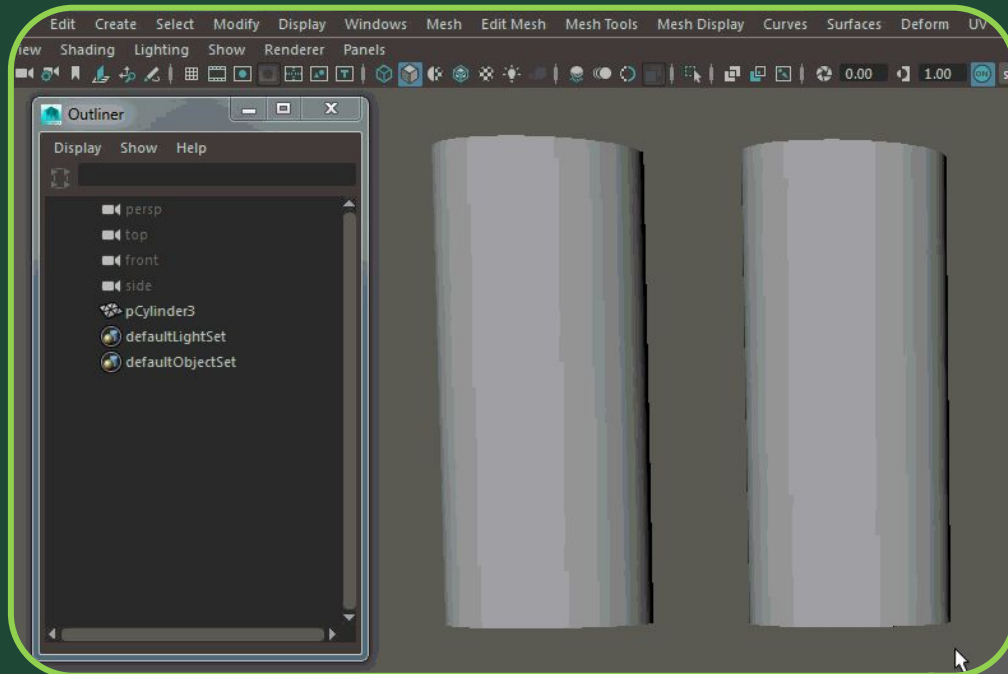
Delete history after combining



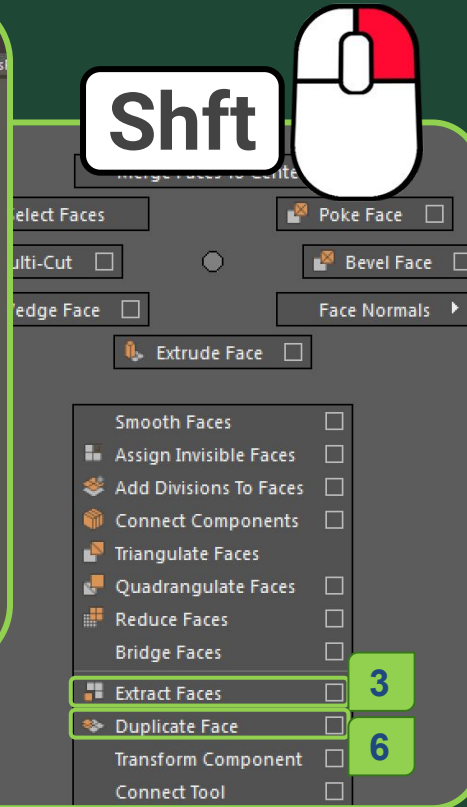
SEPARATE

1. Select a combined object in the viewport or outliner.
2. Hold down Shift and right click.
3. Select Separate from the marking menu.

Poly2|Extract and Duplicate Face



Delete history after combining



EXTRACT FACE

Extract Face, allows you to select faces from an object and extract them to a separate object.

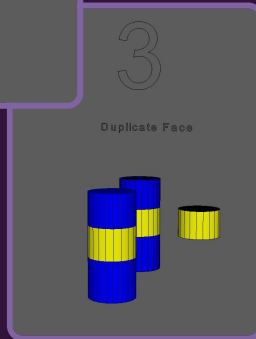
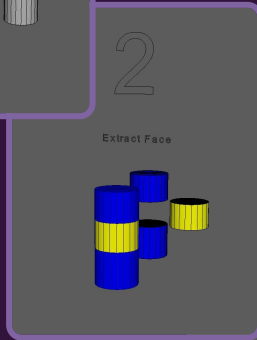
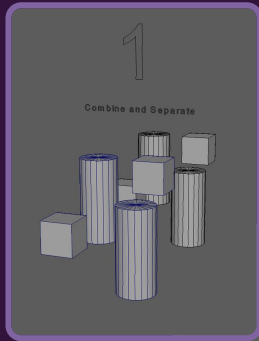
1. Select faces on an object
2. Hold down Shift and right click.
3. Select Extract Faces from the marking menu.

Duplicate FACE

Duplicate Face, allows you to duplicate faces to a separate object.

1. Select faces on an object
2. Hold down Shift and right click.
3. Select Duplicate Faces from the marking menu.

Exercise|Complete Tasks 1 to 3



1. Copy the Project folder, **Project-PolyModelling02** to your desktop
2. Set the folder as your project.
3. Open the scene: **Lesson_Poly2_Part01.mb**
4. Complete tasks 1-3

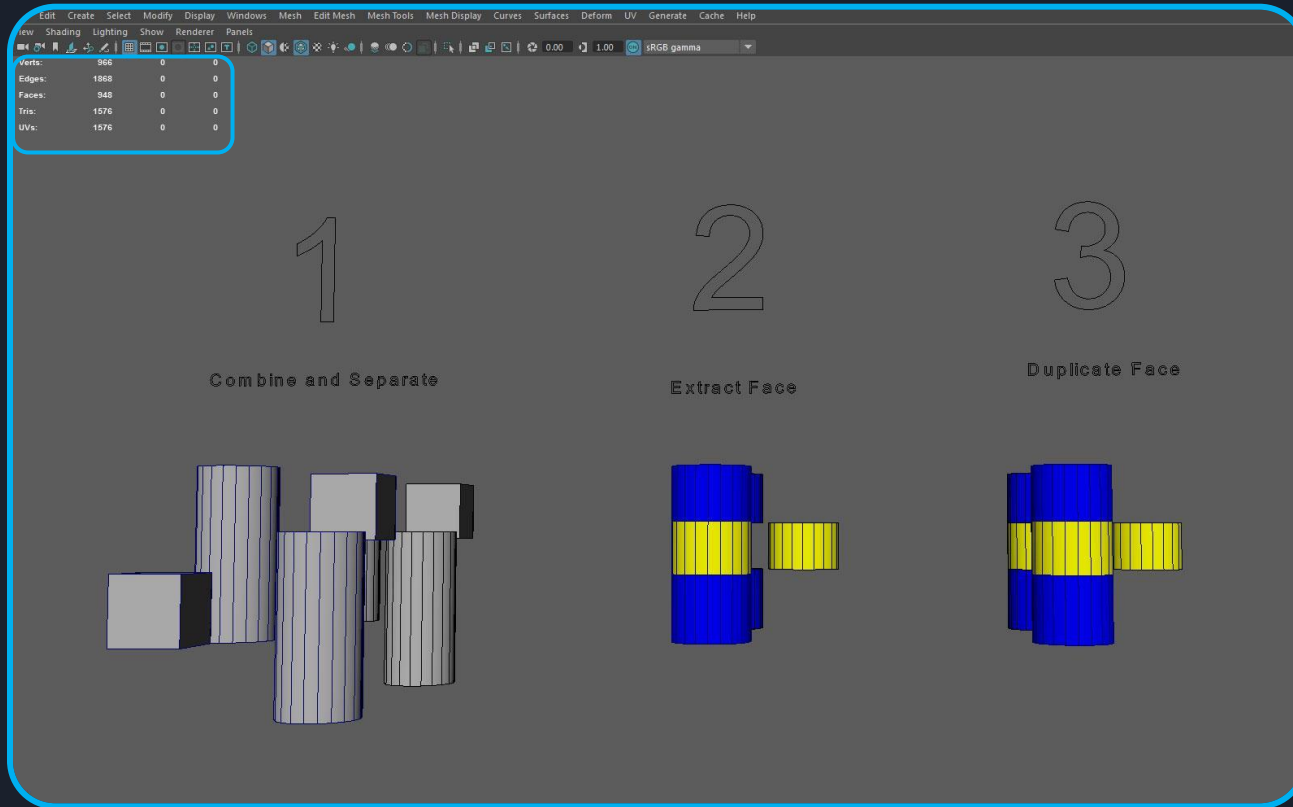
Task 1: Separate the objects, then combine the cubes as one object and the cylinders as one object.

Task 2: Extract the yellow faces from the cylinder and move them aside.

Task 3: Duplicate the yellow faces from the cylinder and move them aside.

You have 10 mins

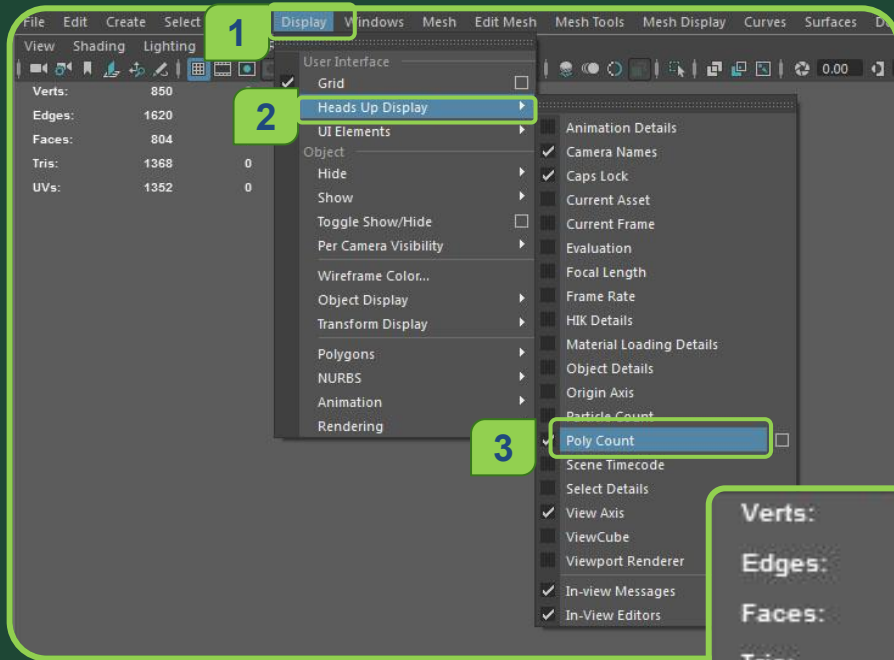
Poly2|Poly Count Display



It's important to have the Poly Count Display in your viewport when modelling.

- Allows you to keep track of how complex your geometry is.
- Helps with troubleshooting geometry issues.
- Allows you to see the effects of merging vertices.

Poly2|Poly Count Display



Turn on Poly Count Display:

1. Click on Display in the Menu
2. Hover over Heads Up Display
3. Tick on the Poly Count Box

Poly Count Display breakdown

- A. Total count for visible polygons
- B. Count for selected objects
- C. Count for selected components

Verts:	A	850	B	0	C	0
Edges:		1620		0		0
Faces:		804		0		0
Tris:		1368		0		0
UVs:		1352		0		0

Poly2|Merging Vertices

Merging vertices, allows you to weld two or more vertices together on an object.

There are three main modes for merging vertices.

1. Merge Vertices to Centre.
2. Merge Vertices.
3. Target weld Tool.

TIP: You can merge any component to centre to create a single vertex.

Poly2|Merge Vertices

Shift



Merge Vertices allows you to merge vertices at a set distance from each other. This is very helpful when combining objects that need to be welded together.

1. Combine 2 objects.
2. Align the objects so that the vertices to be merged are sitting right on each other.
3. In vertex mode, select all the vertices of the object.
4. Hold down Shift and right click.
5. Hover over the Merge Vertices menu.
6. Select Merge vertices options box.
7. Threshold of 0.01 is usually fine for this operation.
8. Click Apply and watch the Polycount HUD to make sure vertex count is reduced.

Poly2|Merge Vertices to Centre

Shift



Merge Vertices to Centre, allows you to select multiple vertices and merge them to one central vertex. This can be helpful for optimising geometry or creating tapered forms.

1. In vertex mode, select multiple vertices.
2. Hold down Shift and right click.
3. Hover over the Merge Vertices To Center.

Poly2|Target Weld Tool

Shift



Target Weld Tool, allows you to selectively weld vertices together on an object.

1. Combine 2 objects.
2. Hold down Shift and right click.
3. Hover over the Merge Vertices menu.
4. Select Target Weld Tool
5. Click and hold down left mouse button on a vertex.
6. An orange circle will appear around the vertex.
7. With the left mouse button still held down, drag the vertex to another vertex.
8. An orange line will connect the two vertices.
9. Release left mouse button to weld vertices together.

Poly2|Collapse Edges

Collapse Edge, allows you to Select an edge or edges and collapse them down to a midpoint. This is very helpful when you want to collapse a ring of edges around an object.

Poly2|Collapse Edge

Shift



1. Select an edge .
2. Hold Shift and double click the edge next to it to make a complete ring selection.
3. Hold down shift and right mouse button.
4. Hover over Merg/Collapse Edges.
5. Select Collapse Edges.

Poly2|Ctrl Delete Edges

Ctrl delete edges, allows you to delete edges on an object and the associated vertices. This is very important, in order to maintain clean geometry and avoid modelling and technical issues.

Poly2|Ctrl Delete Edges

Hold

Ctrl

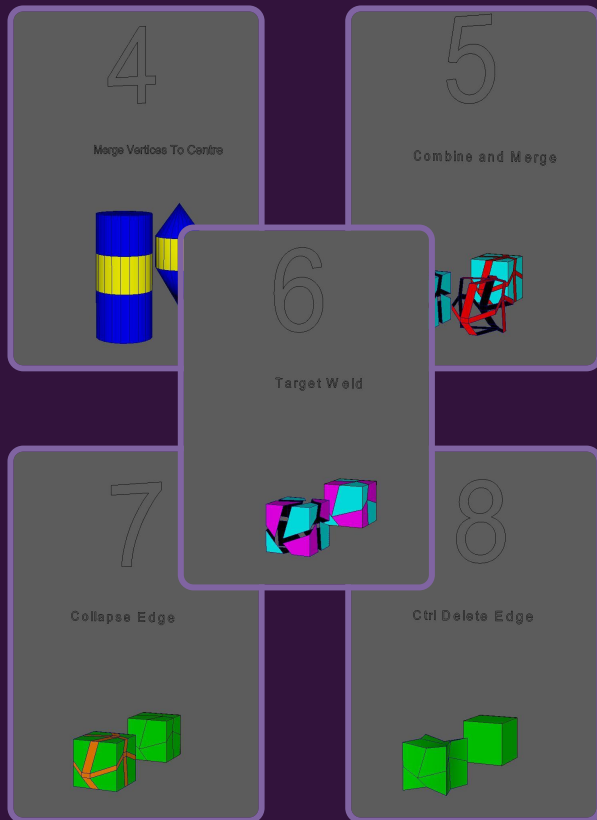
+

Delete

1. Select an edge loop.
2. Hold Ctrl down and press Delete.

NOTE: Delete the edges on the first practice cube and Ctrl delete the edges on the second cube to see the difference in results.

Exercise | Complete Tasks 4 to 8



1. Open the scene: **Lesson_Poly2_Part01.mb**
2. Complete tasks 4-8

Task 4: Merge Vertices to center to match the example shape.

Task 5: Move and snap the red ribbon object to exactly fit the blue cube. Combine the red ribbon and blue cube. Perform a vertex merge on the object to weld all connected vertices together.

Task 6: Target weld vertices together to match the example cube object.

Task 7: Collapse edges to match the example cube object.

Task 8: Ctrl delete Edges to match the example cube.

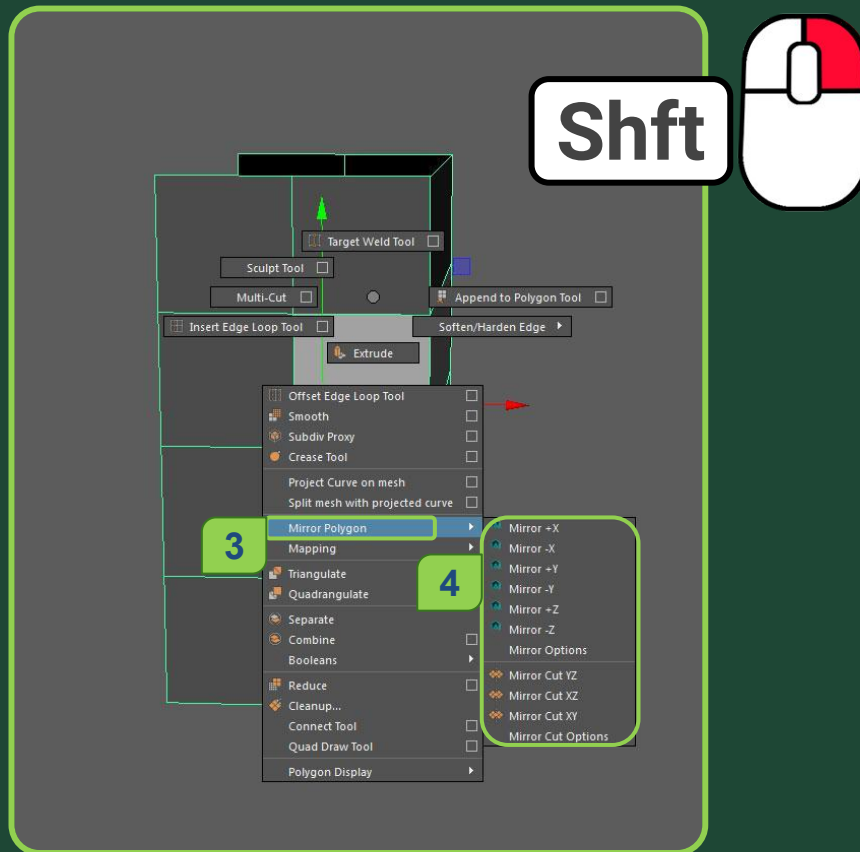
You have 15 mins

Poly2|Mirror Polygon

Mirror geometry, generates a mirror image of an object along any axis and automatically merge the connected vertices.

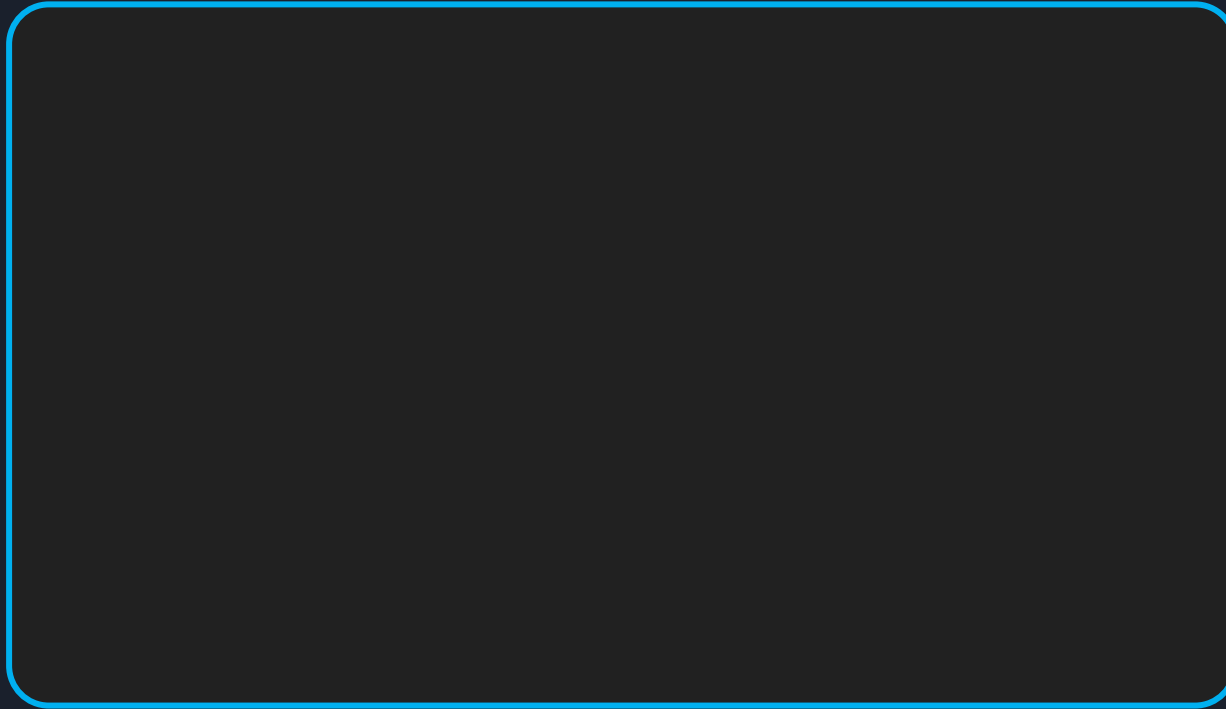
- This is very useful when building symmetrical models.
- It allows you to build one half and then mirror it to create the whole object.

Poly2|Mirror Polygon



1. Select an object in object mode.
2. Hold down Shift and and right mouse button.
3. Hover over Mirror Polygon
4. Select which axis to mirror across.

Poly2|Negative Scale Mirror



Negative scale mirror, Allows you to duplicate geometry and mirror it across an axis by negative scaling.

- This is very useful when mirroring an object across a custom pivot point

Poly2|Negative Scale Mirror

2

Ctrl + D

Hold

D

3

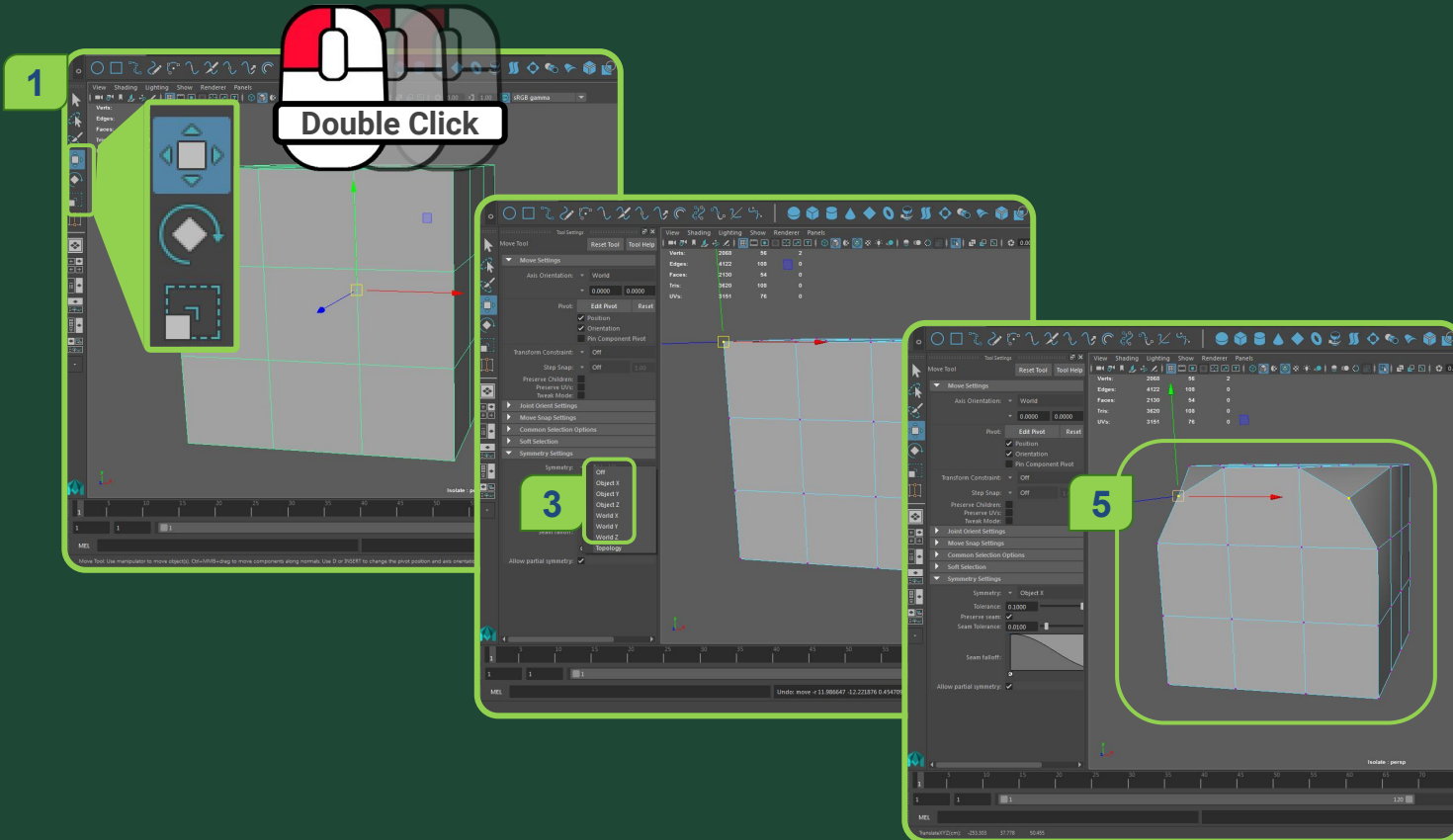
5

1. Select an object.
2. Duplicate the object (Ctrl+D).
3. Hold down D on the keyboard to move the pivot point to where you want to mirror from.
4. Go to the channel box.
5. Add a Minus symbol in front of the scale axis you want to mirror across.
6. Press Enter.

Poly2|Symmetry

- Symmetry Allows you to manipulate components on both sides of a symmetrical object at the same time.
- This is very helpful when working on symmetrical models.

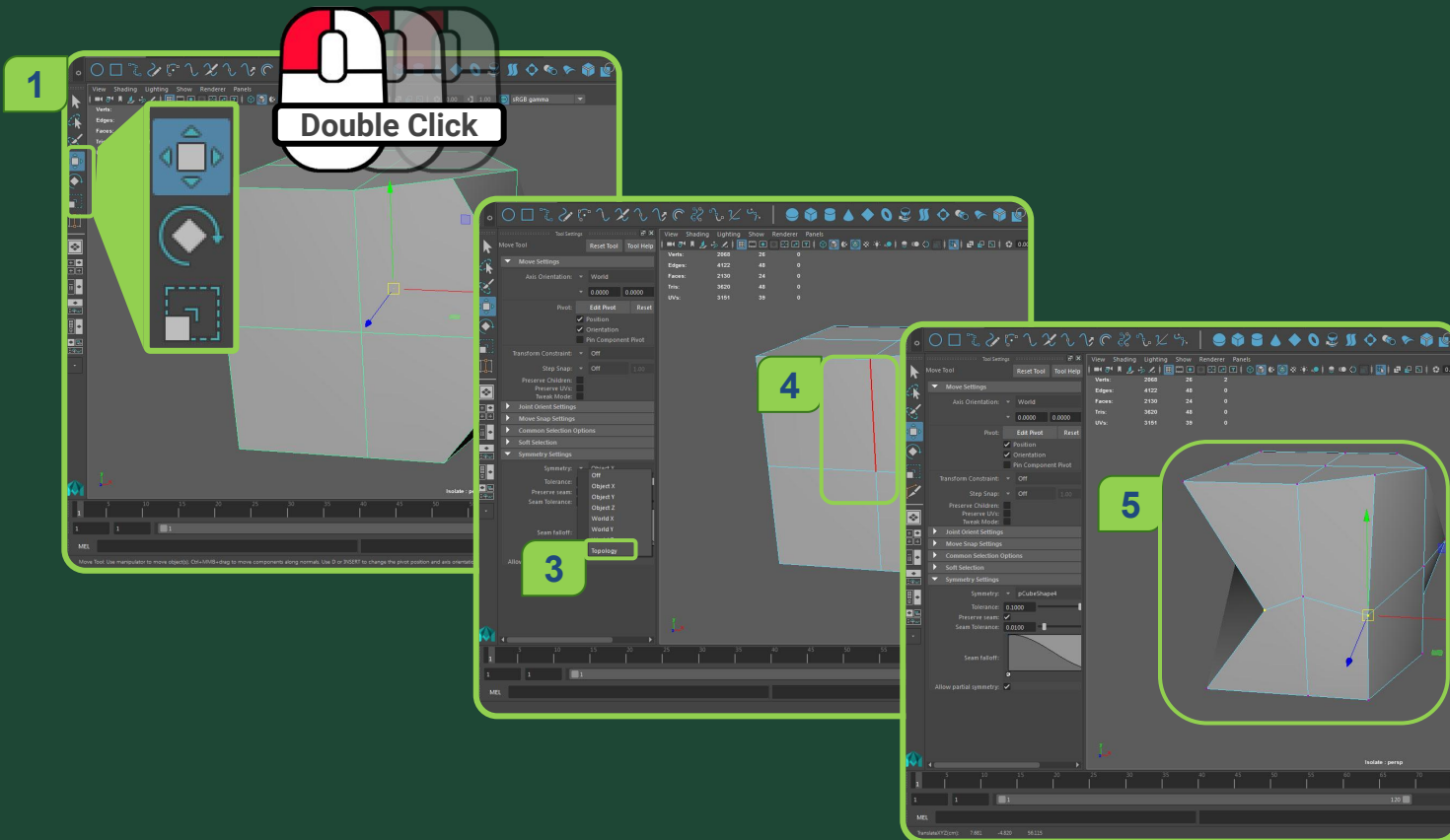
Poly2|Symmetry|World and Object



1. Double left mouse click on one of the Transform buttons to open tool settings.
2. Go to the Symmetry sub menu.
3. Left click on the Symmetry drop down menu and select one of the object axes to apply symmetry to.
4. Edit components.

NOTE: World X,Y,Z works for symmetrical geometry across the centre of the world grid. Object X,Y,Z will only work with objects transformed away from the grid center, that have transform values.

Poly2|Symmetry|Topology



Topology symmetry, allows you to choose an edge across which symmetry will apply. This works on symmetrical and asymmetrical objects.

1. Double left mouse click on one of the Transform buttons to open tool settings.
2. Go to the Symmetry sub menu.
3. Left click on the Symmetry drop down menu and select Topology
4. Click on the edge you would like to designate as the center of symmetry.
5. Edit components.

NOTE: Topology Symmetry works with most modeling tools.

Exercise|Repair the Pig



1. Open the scene, Boar01.mb
2. Using the Pig Bits on the table, assemble the character to resemble the Example Pig model.
3. Make sure that vertices are merged where necessary.

You have 20 mins