



2. Basics of 3D Modeling: II. Edit Mode

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Outline

I. Object mode

II. Edit mode

III. Modifiers

IV. Sculpting system

V. Curves, surfaces, freeform modeling

VI. Meta objects

VII. Background image

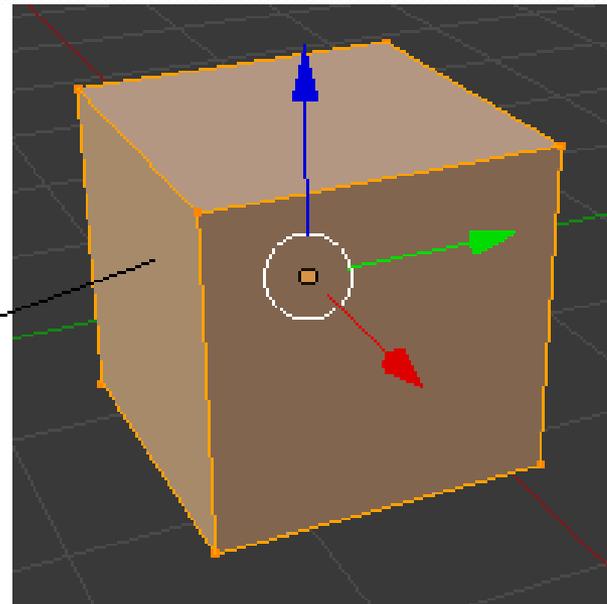
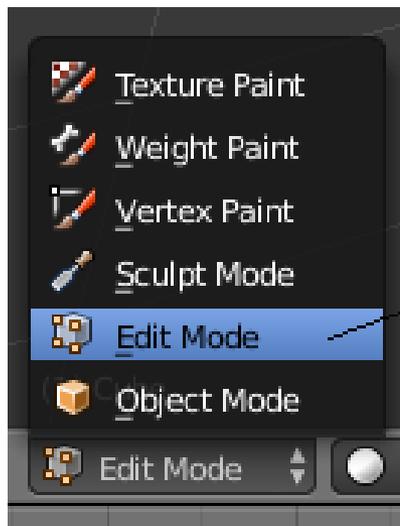
VIII. Procedural Description and physical simulation

IX. Photogrammetry and Image based Modeling

X. High and low polygon modeling

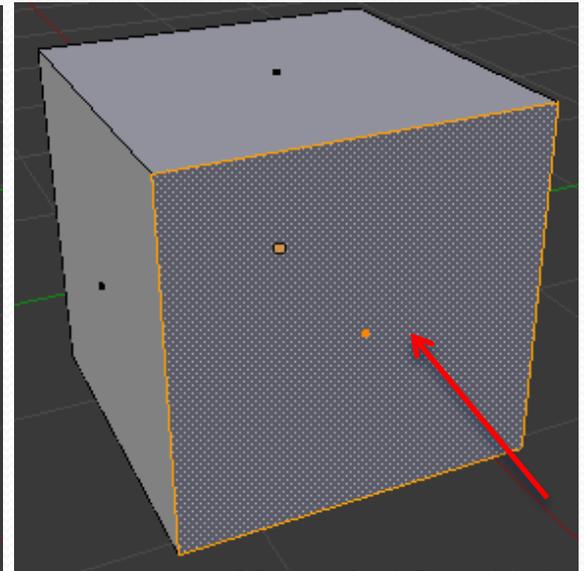
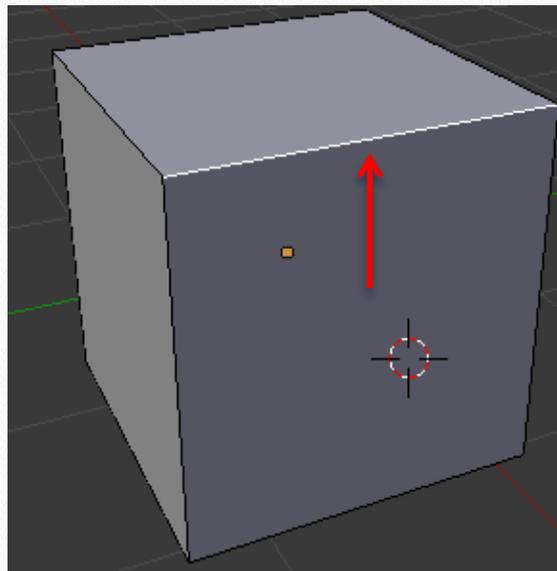
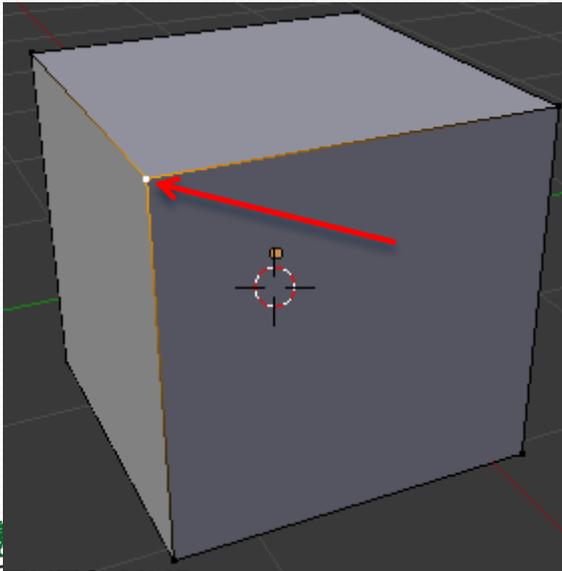
II. Edit mode

- It allows to **manipulate the underlying structure** of an object
- It allows managing the basic elements of a mesh object



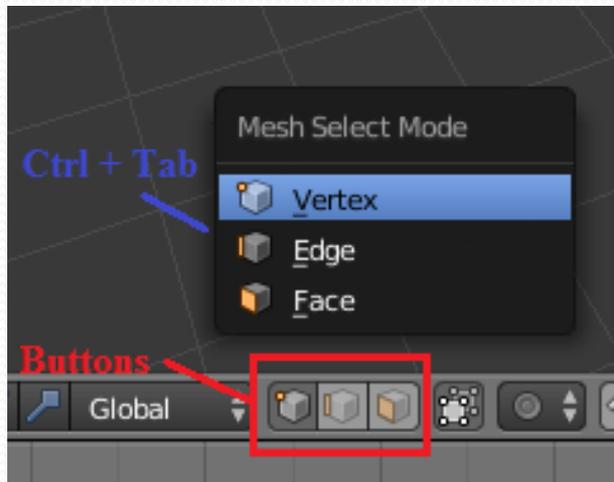
II. Edit mode

- Basic elements of a mesh object:
 - **Vertices**: are the connecting points that hold everything together.
 - **Edges**: connect two vertices, forming the side of a face and determining the layout of a mesh.
 - **Faces**: are composed of three or more edges. Faces in general are referred to as polygons; they act as the surface of a mesh.



II. Edit mode

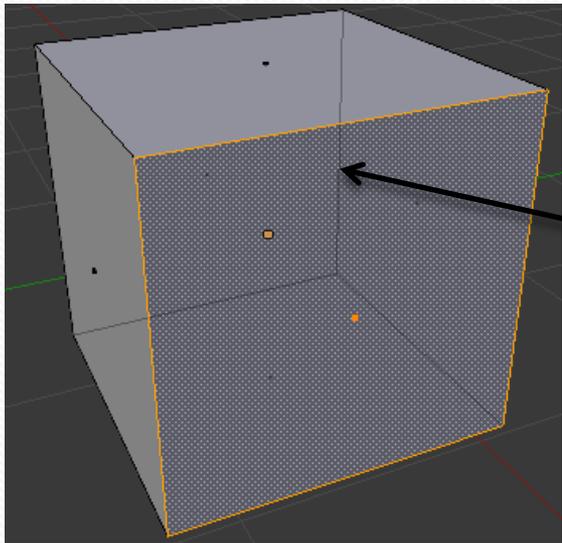
- Vertex, Edge, and Face Select Mode: Blender gives the ability to select individual mesh elements
 - **Vertex Select Mode** permits to select individual vertices, or a series of vertices for whole edges and/or faces.
 - **Edge Select Mode** enables to select whole edges at a time. It also lets select adjacent edges without selecting the respective face.
 - **Face Select Mode** allows to select entire faces.



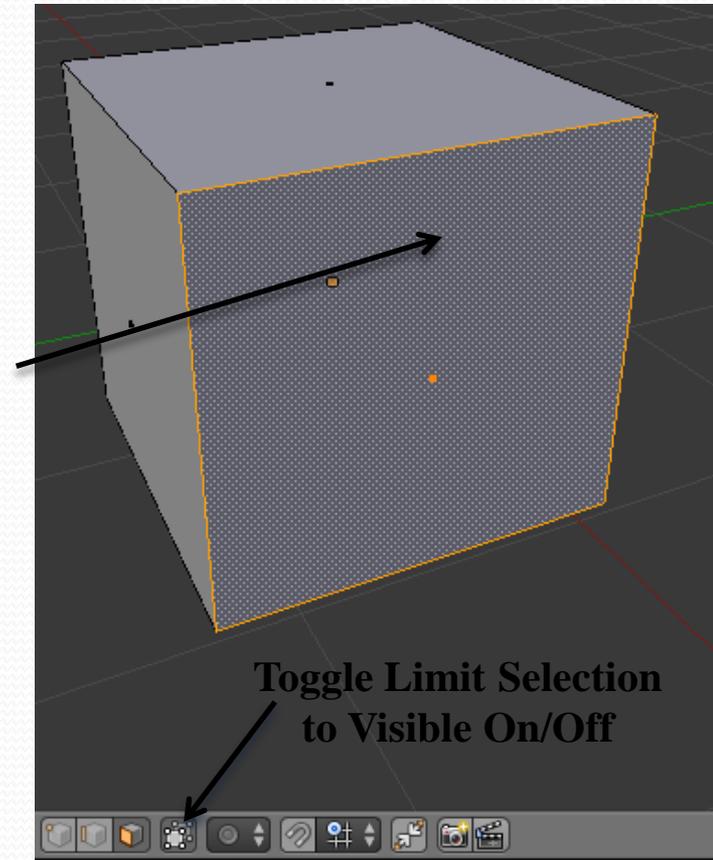
Ctrl + Tab : switch the selection method
Shift + LMB to activate any combination

II. Edit mode

- **Limit Selection to Visible** function: allows to see only the front surface and to select only vertices on the front.



With 'Limit Selection to Visible' On only vertices or faces that you can see are able to be selected.

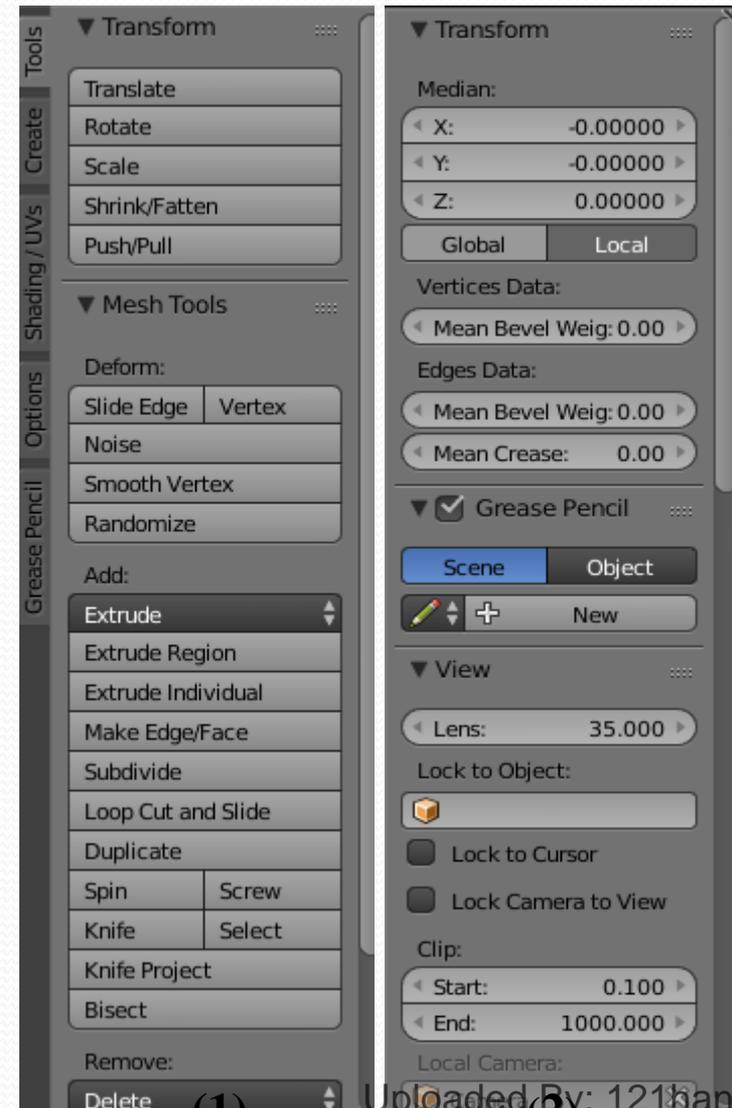


Toggle Limit Selection to Visible On/Off

II. Edit mode

- **Tool Shelf (1):**
 - When entering Edit mode, several mesh tools become available.
 - Open/close the Mesh Tools panel using **T Key**.
- **Properties Shelf (2):**
 - Open/close the Properties Shelf using **N Key**.
 - Contains many useful panels directly related to mesh editing (Transform panel, Mesh display...)

**Specials menu (W),
Edge menu (Ctrl E),
Face menu (Ctrl F).**



(1)

(2)

Uploaded By: 121han

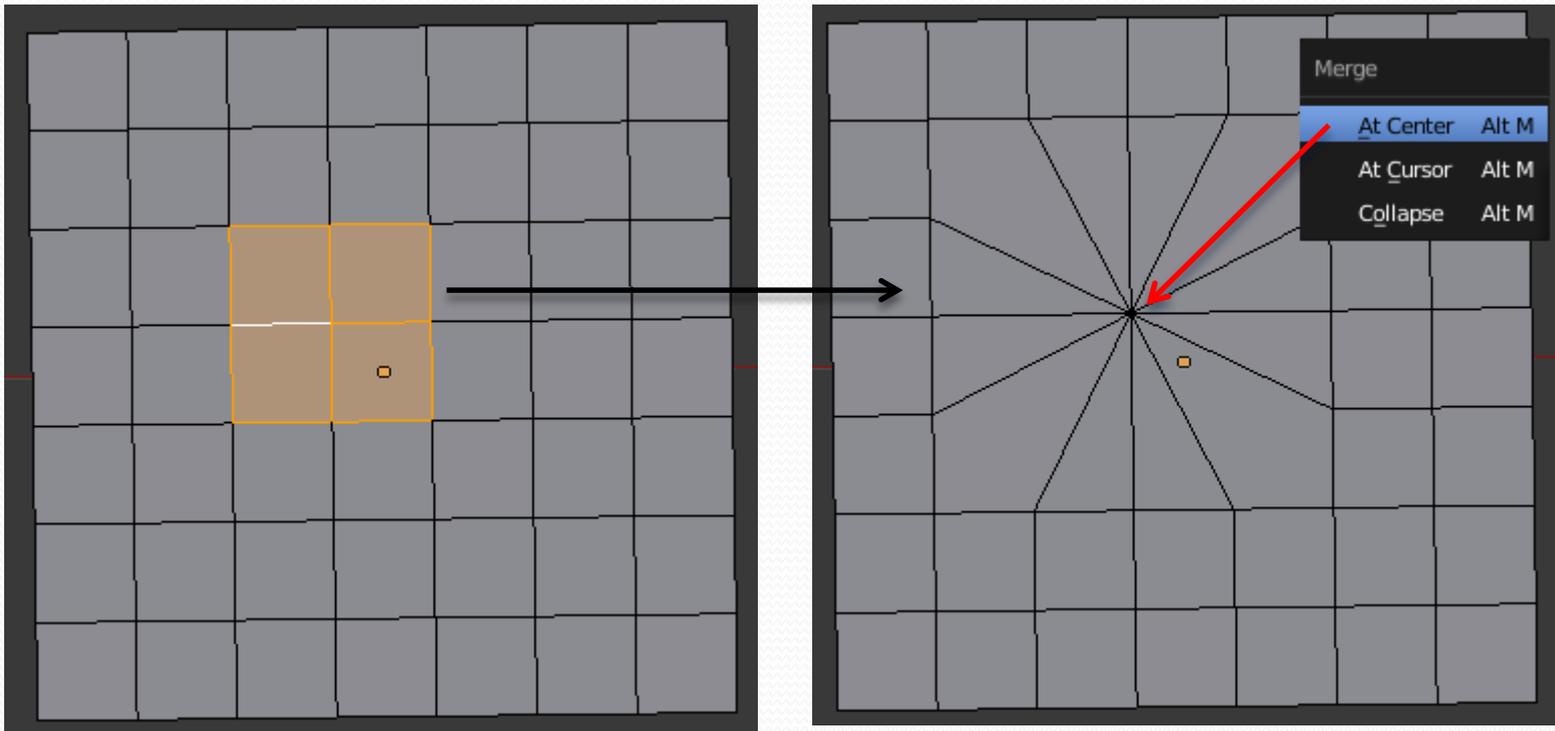
Activity

➤ Activity 2.6: Manipulate vertices (15 min)

- Using a plane mesh, apply the following vertices transformations:
 - Subdivide the plane mesh into 7 by 7 square
 - Select and merge some vertices at the center
 - Select and separate some vertices with rip
 - Select and separate some vertices with rip fill
- Make edges/faces using some isolated vertices
- Make faces using some isolated edges
- Make faces using mixed edges and vertices

Solution

Merging vertices

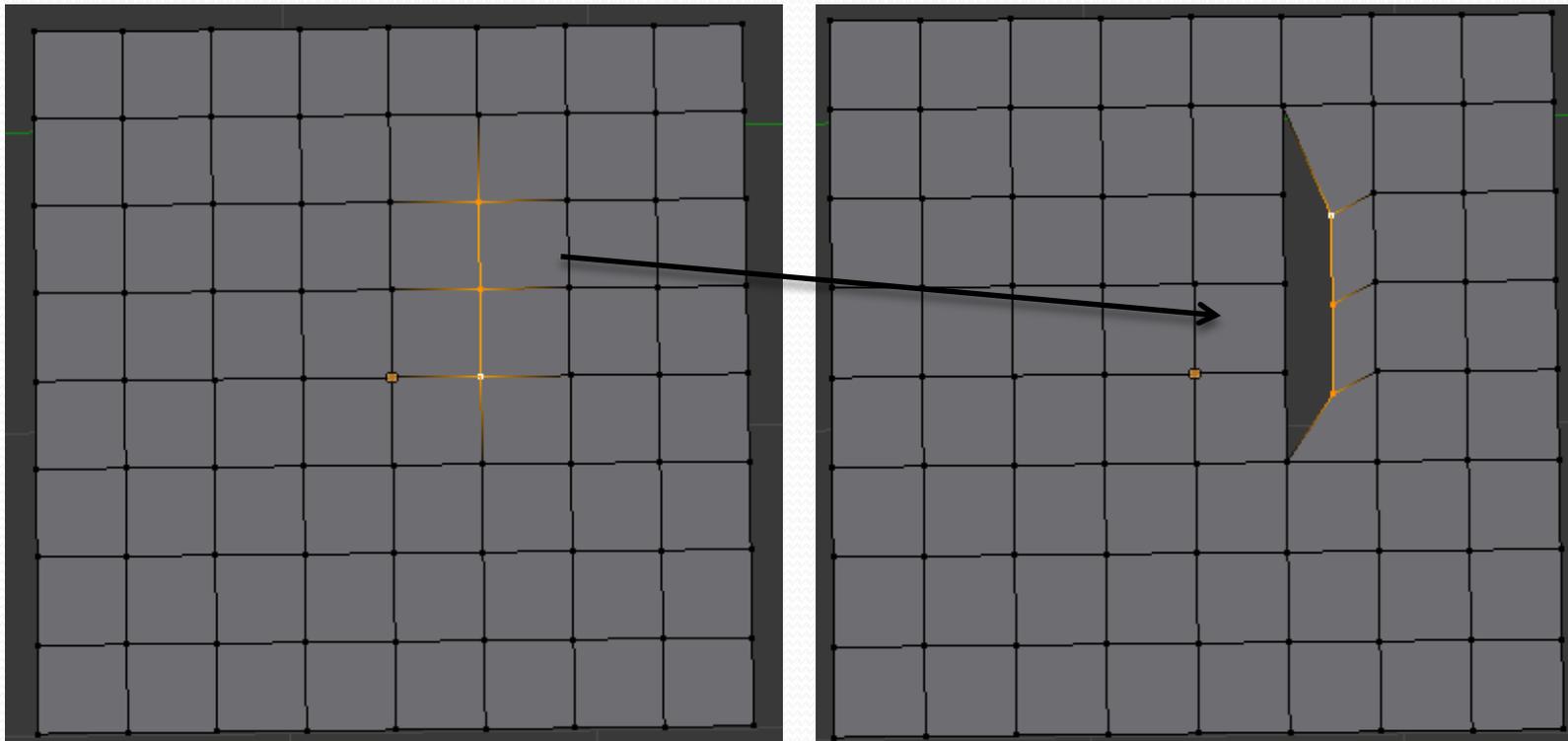


Solution

Separating vertices with rip using V key

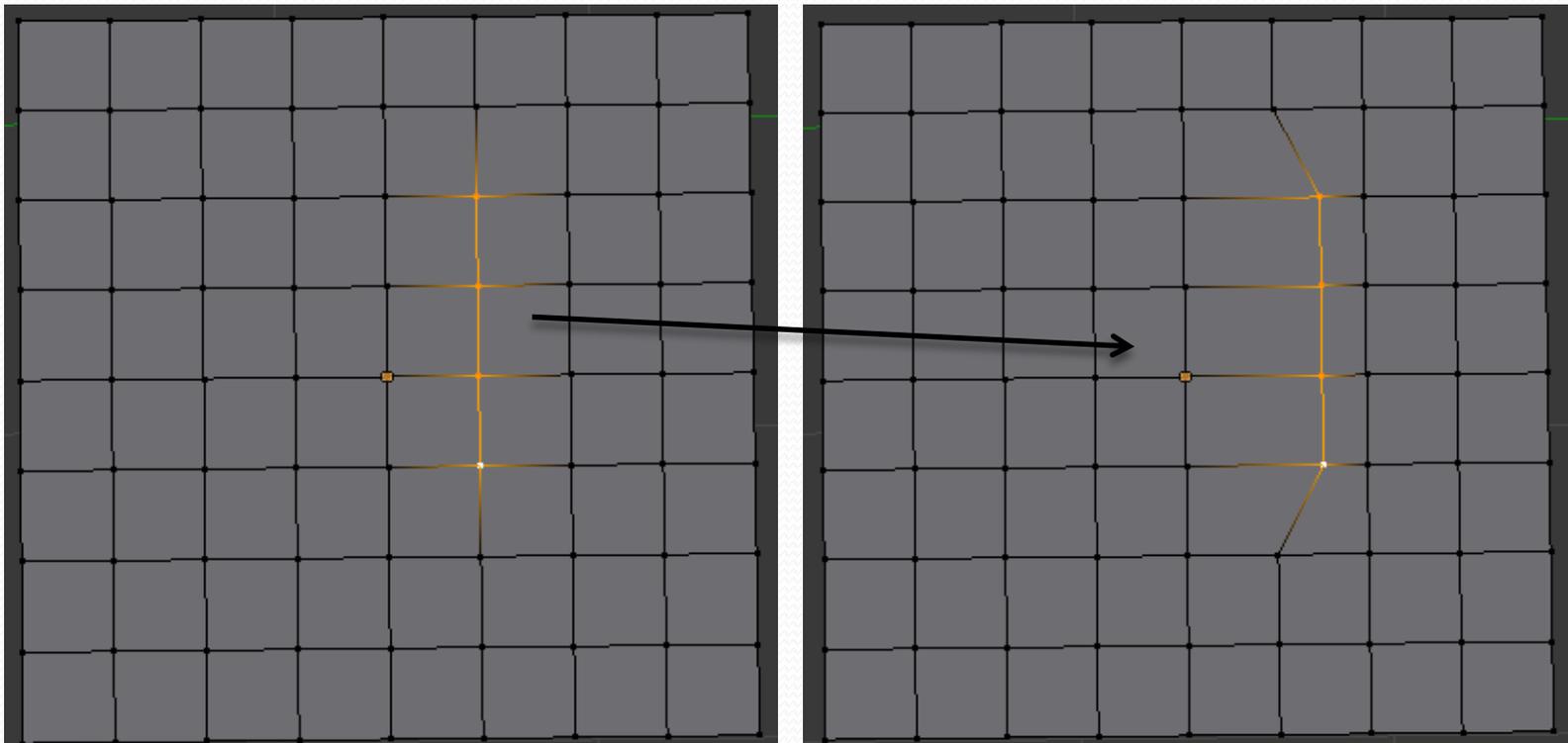
Make a hole by making copies of selected vertices and moving them.

Rip with edges and vertices

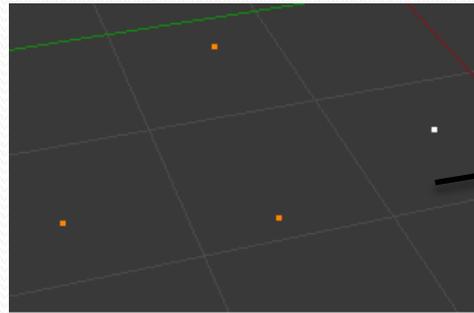


II. Edit mode

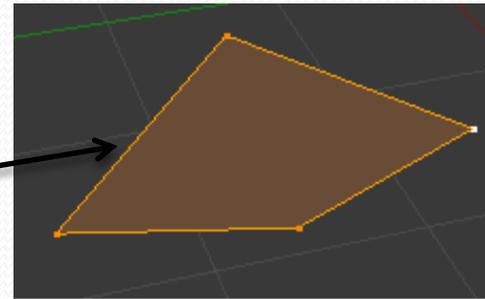
Separating vertices with rip fill using Alt V Key
Making copies of selected vertices/edges **without making a hole**



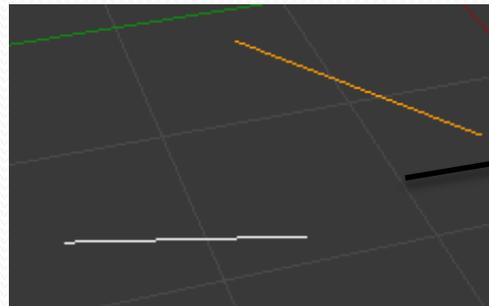
Solution



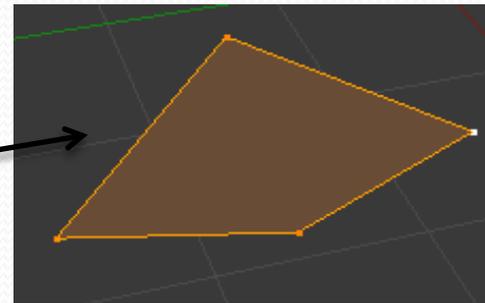
Before



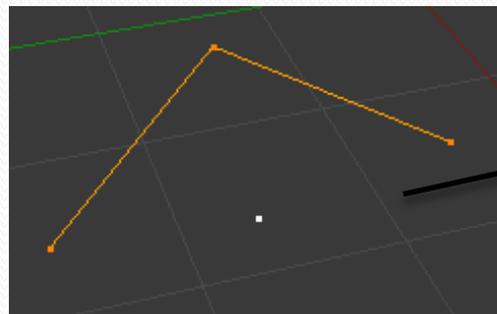
After



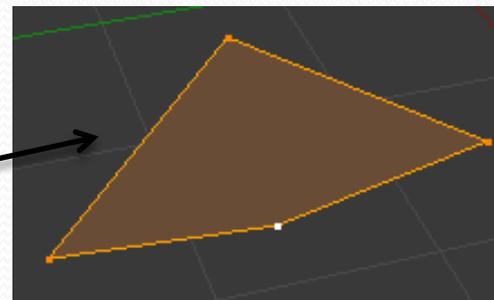
Before



After



Before



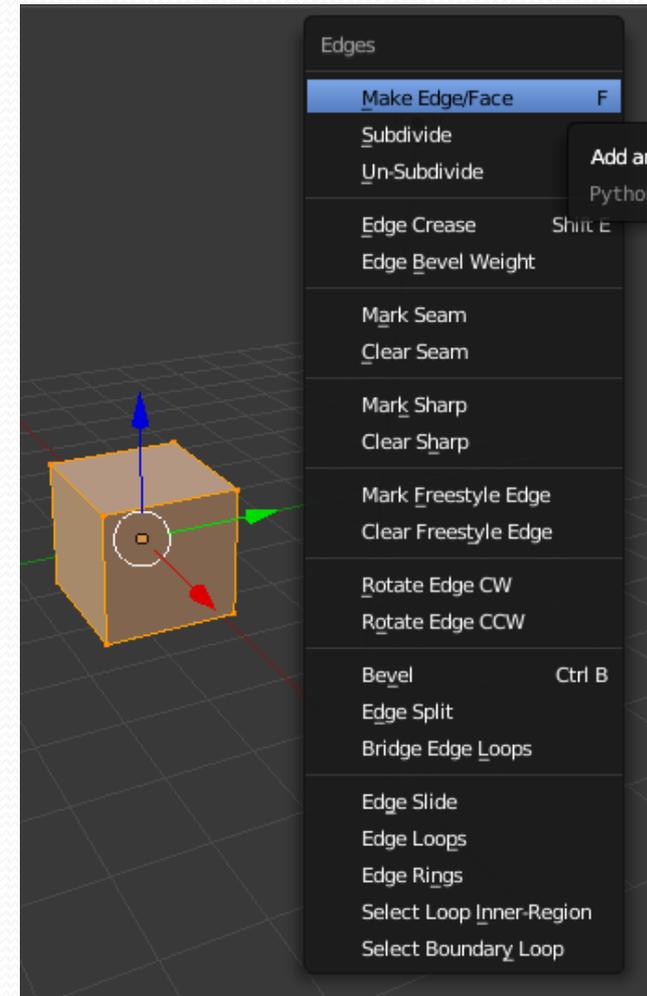
After

II. Edit mode

➤ Edges menu:

Contains numerous edge options and is obtained by pressing **Ctrl+E** Key. The most useful options are :

- **Edge Slide**: This allows the selected edgeloop to be moved from side to side.
- **Edge Loop**: If one edge is selected, this option will continue the line to select the rest of the edgeloop.
- **Edge Ring**: If one edge is selected, this option allows selecting a **parallel ring running perpendicular to the selected edge**.

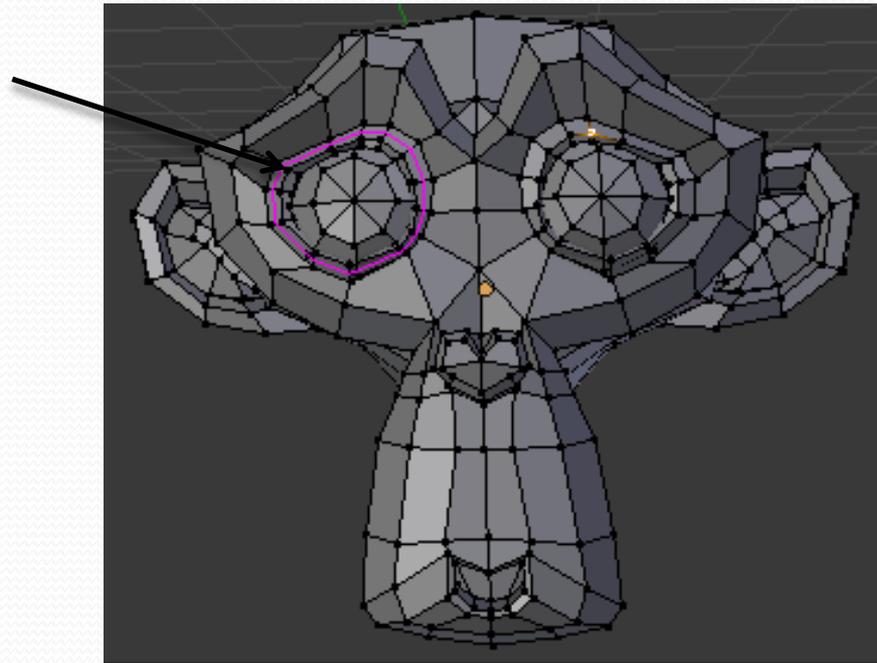


Activity

➤ Activity 2.7: Manipulate vertices (15 min)

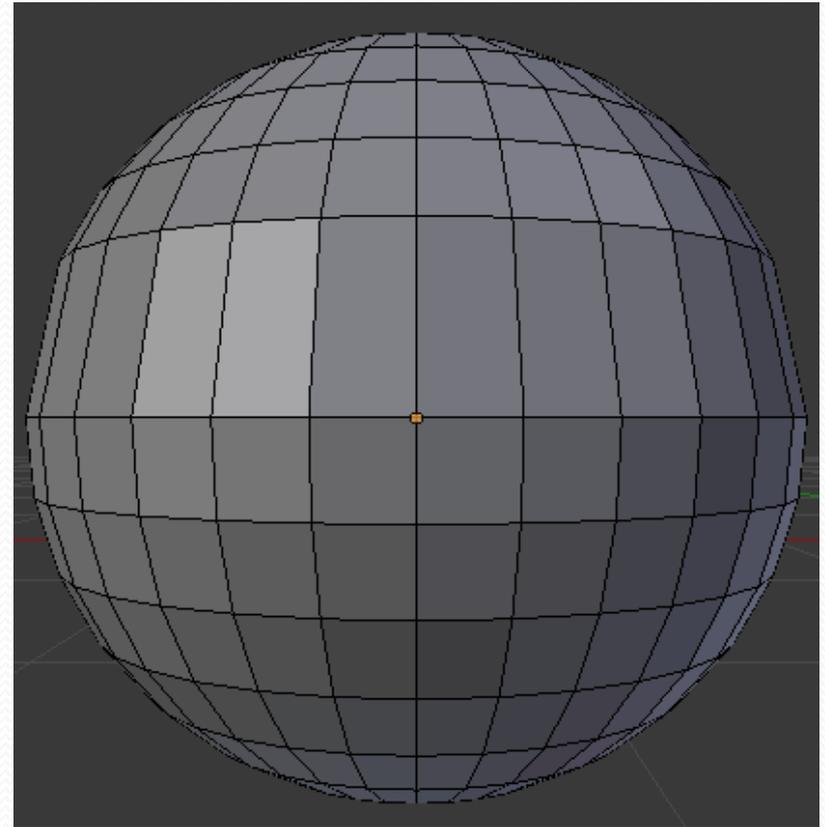
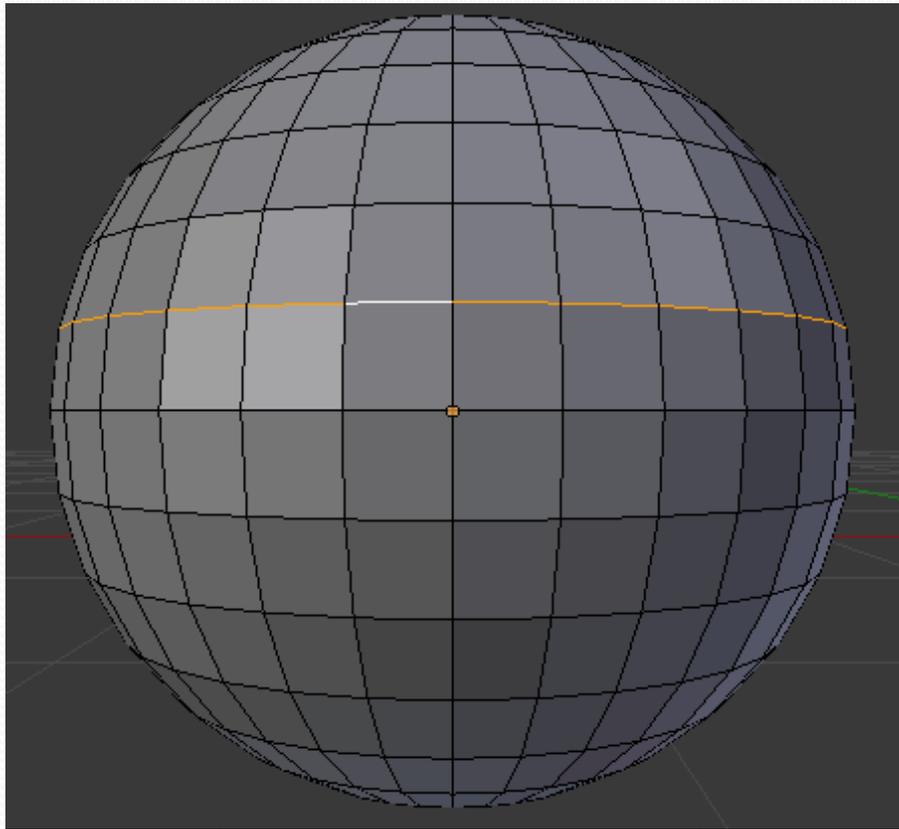
- Using primitive meshes, give some example of use of the following operations:
 - Add edge loop
 - Delete edge loop
 - Bridge edge loop
 - Split edges

Solution



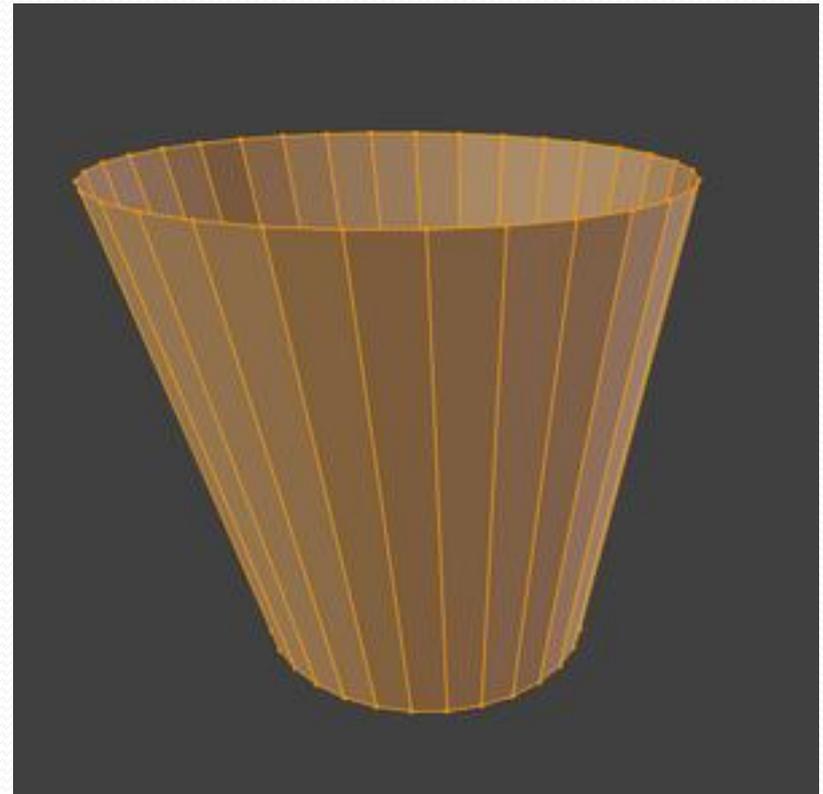
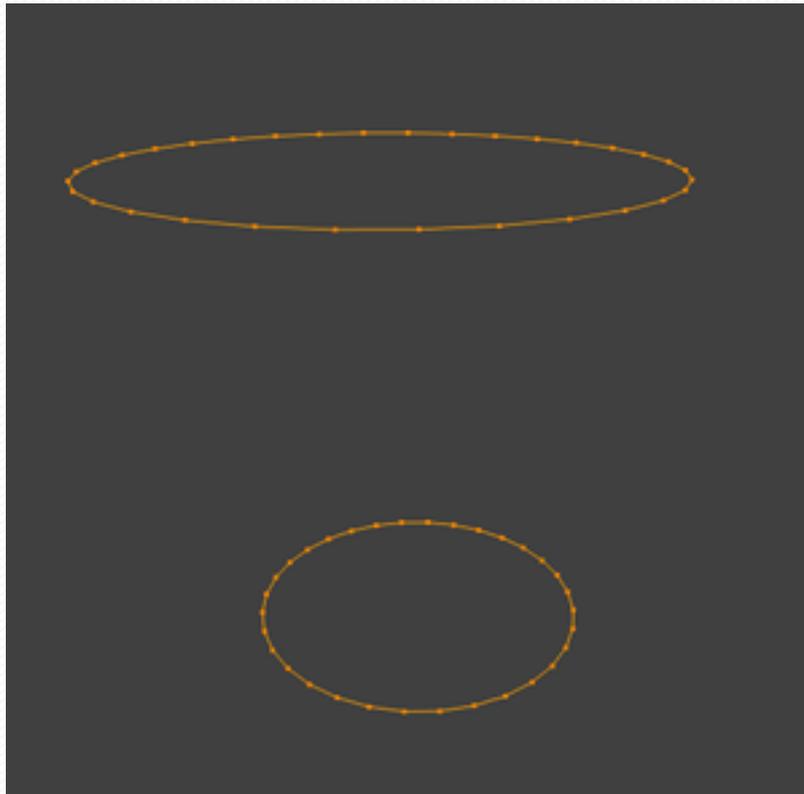
Solution

Delete Edge Loop



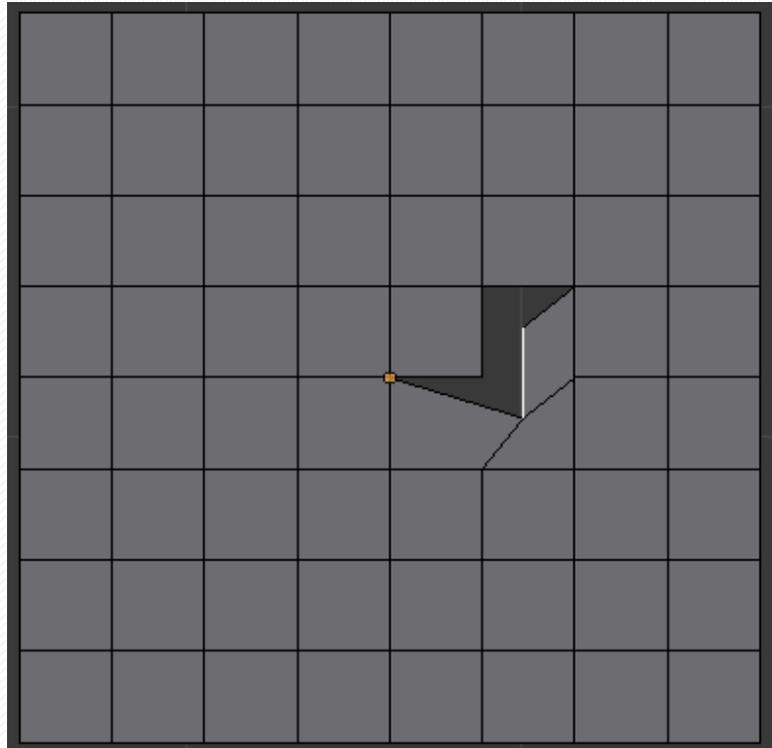
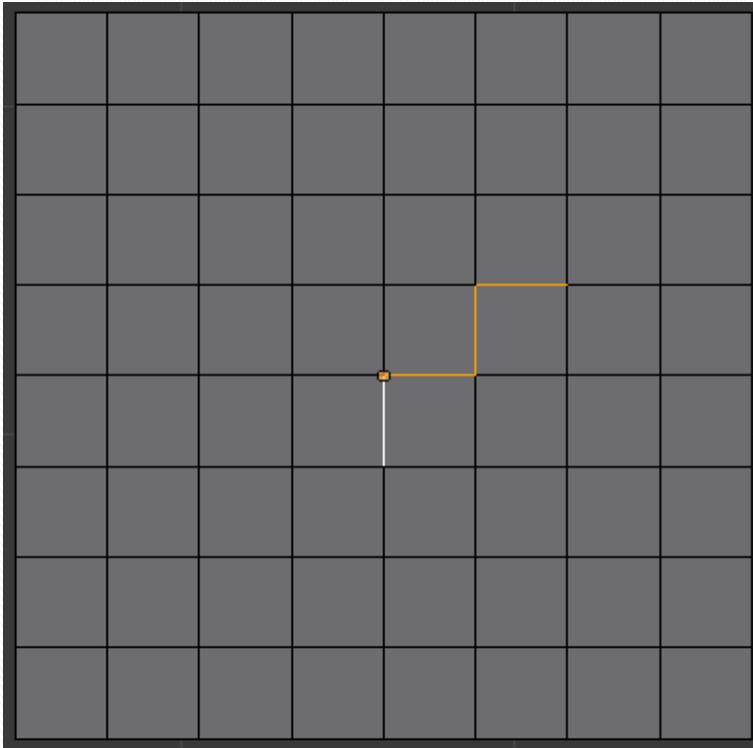
Solution

Bridge Edge Loops



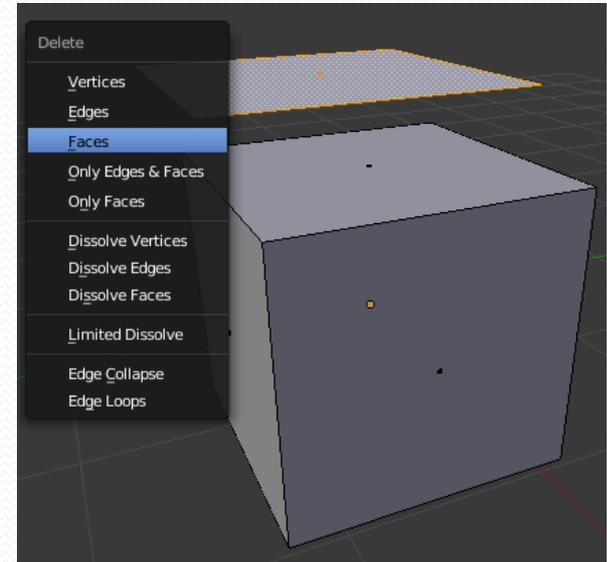
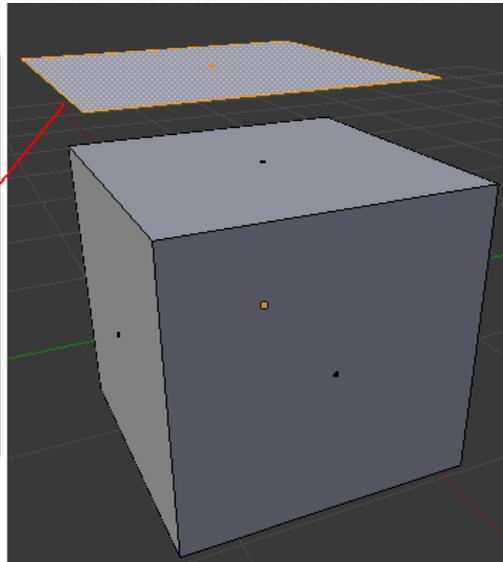
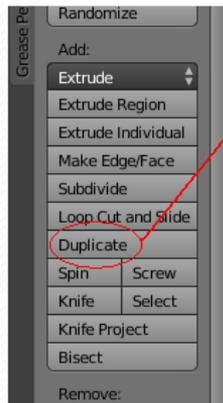
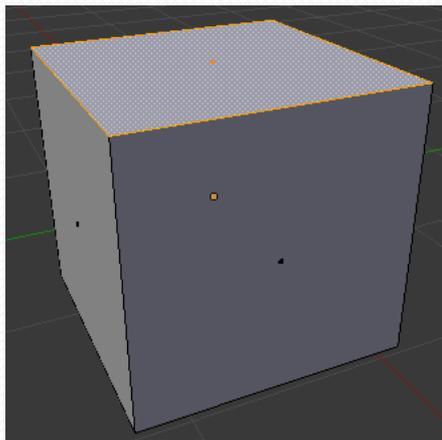
Solution

Edge split Y



II. Edit mode

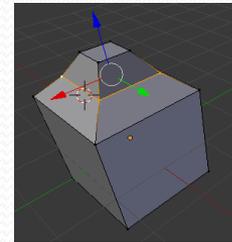
- Duplicating and Deleting operations:
 - **Duplicate**: To duplicate a vertex, edge, or face, click Duplicate from the Object Tools panel or press **Shift+D** key.
 - **Delete**: to delete a vertex, edge or face, click Delete from the Object Tools panel or press **X** key.



II. Edit mode

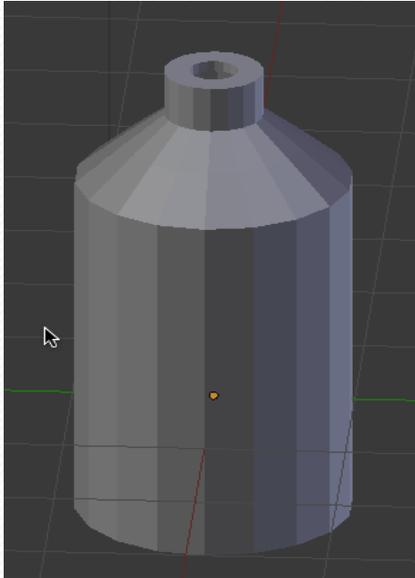
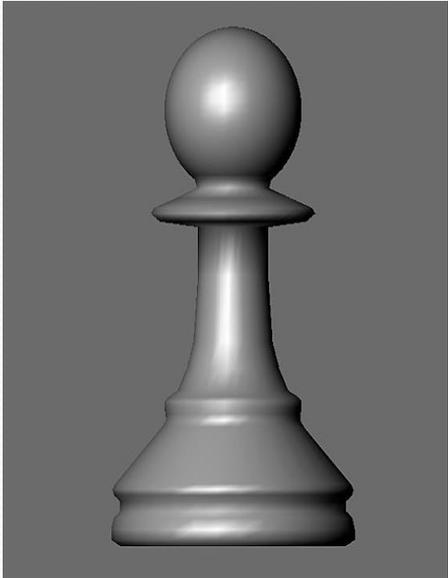
- Other Duplicating tools:

- **Inset**: takes the currently selected faces and **creates an inset of them**, with adjustable thickness and depth.



- **Spin**: does a sort of **circular extrusion of your selected elements, centered on the 3D cursor**, and around the axis perpendicular to the working view. (draw profile- top view- spin)
- **Screw**: combines a repetitive Spin with a translation, to generate a screw-like, or spiral-shaped, object.

Activity

Activity 2.8	Title: Model a Bottle / chess piece
Type:	Individual activity- Lab exercise
Goal:	Use the spin tool to model meshes ILO P1 + using background Image
Outline:	Model a bottle that looks something like the attached image using the Spin tool:  
Timeline	15 min
Assessment	Assess the student's solution

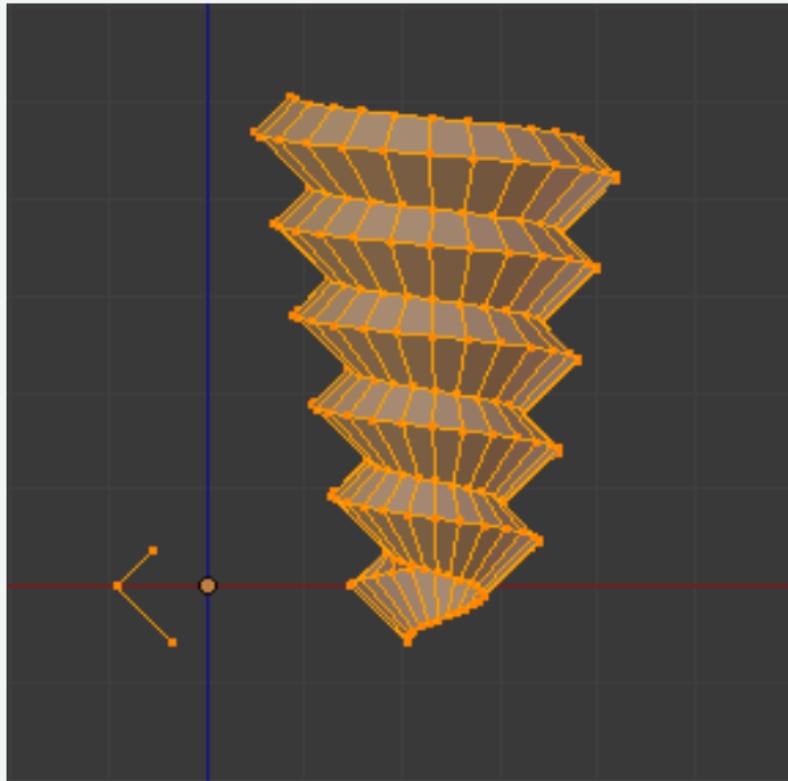
II. Edit mode

Screw

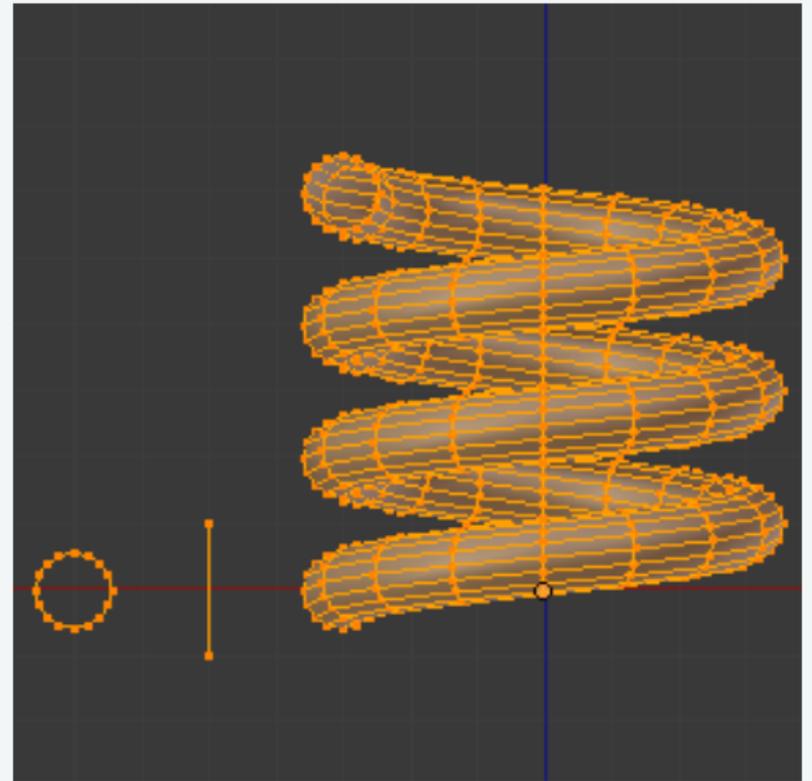


II. Edit mode

Screw



Wood Screw tip done with the Screw tool.

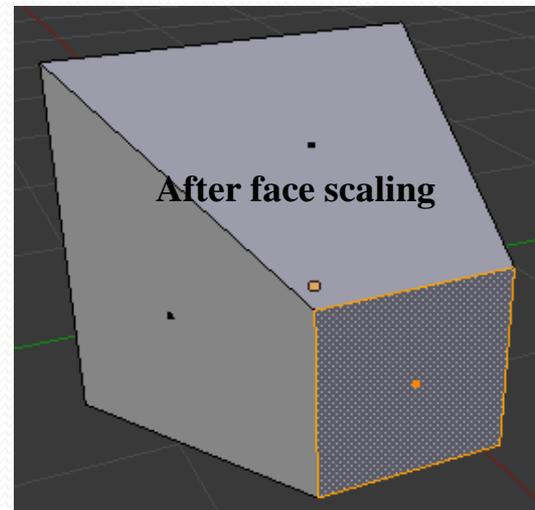
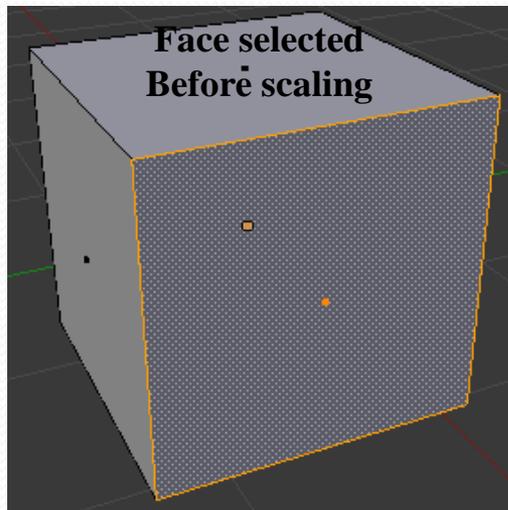


Spring done with the Screw tool.

II. Edit mode

➤ Translating, Rotating, and Scaling operations

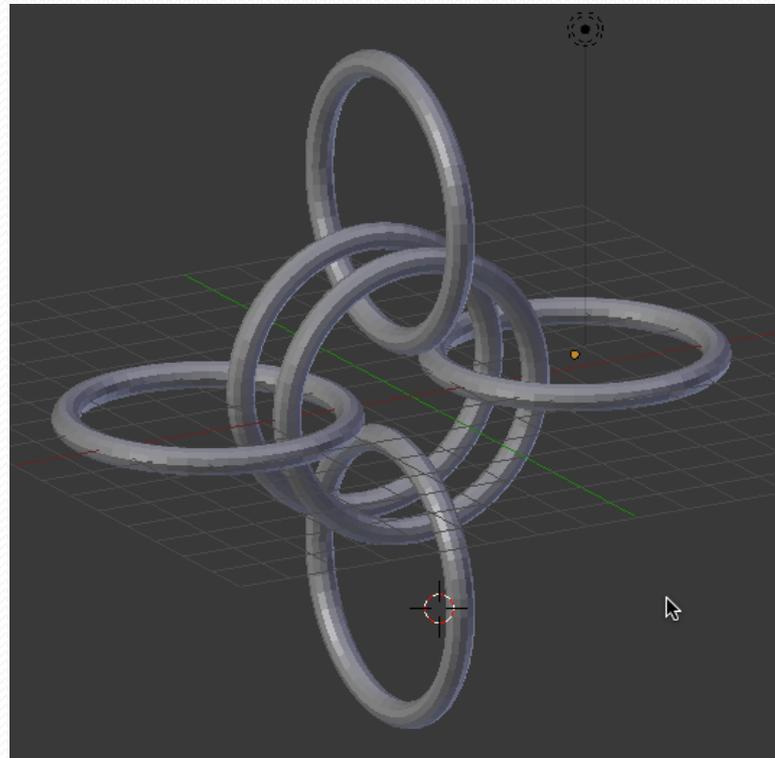
- **Translate:** To translate (move) a vertex, edge, or face, click Translate from the Object Tools panel or press G key.
- **Rotate:** To rotate a vertex, edge, or face click Rotate from the Object Tools panel or press R key.
- **Scale:** To scale a vertex, edge, or face, click Scale from the Object Tools panel or press S key.



Activity

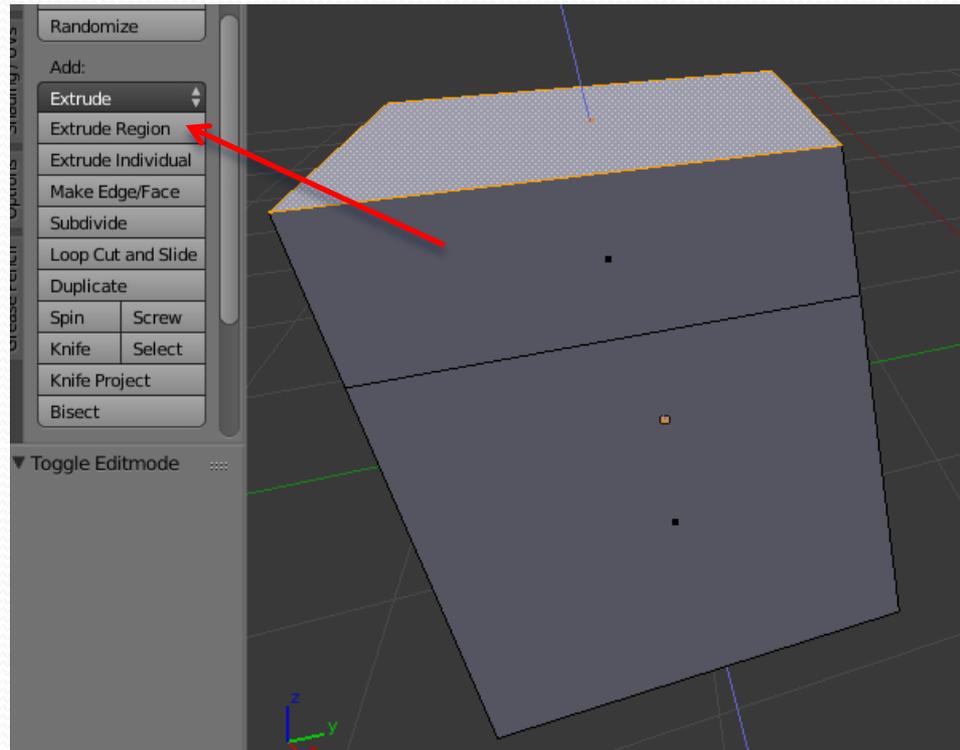
➤ Activity 2.9 (20 min):

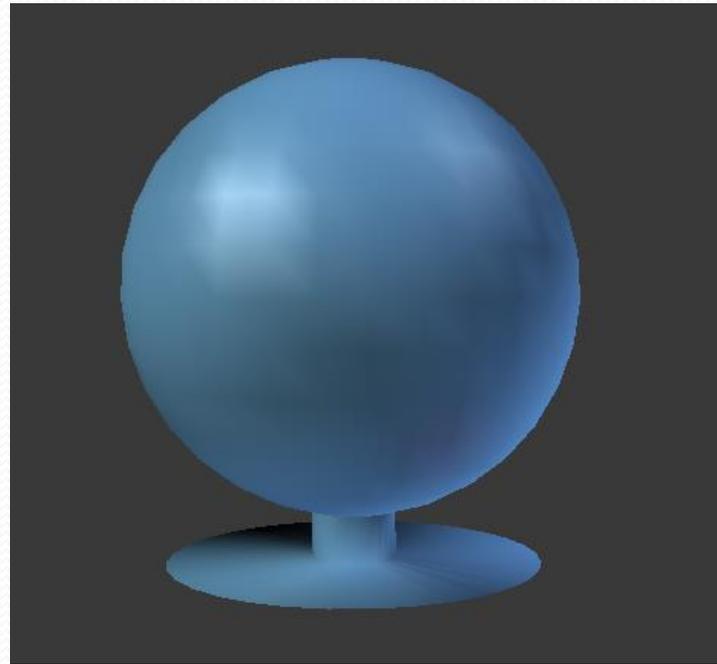
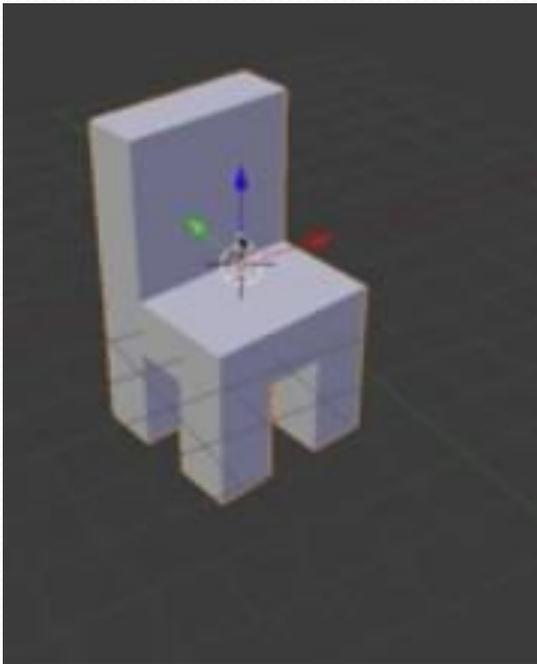
- Arrange a number of scaled/modified torus objects in a configuration that looks something like this image.
- Variation - Add and angle to each of the torus objects.



II. Edit mode

- **Extrude:** It allows creating parallelepipeds from rectangles and cylinders from circles, as well as easily create such things as tree limbs.





Activity

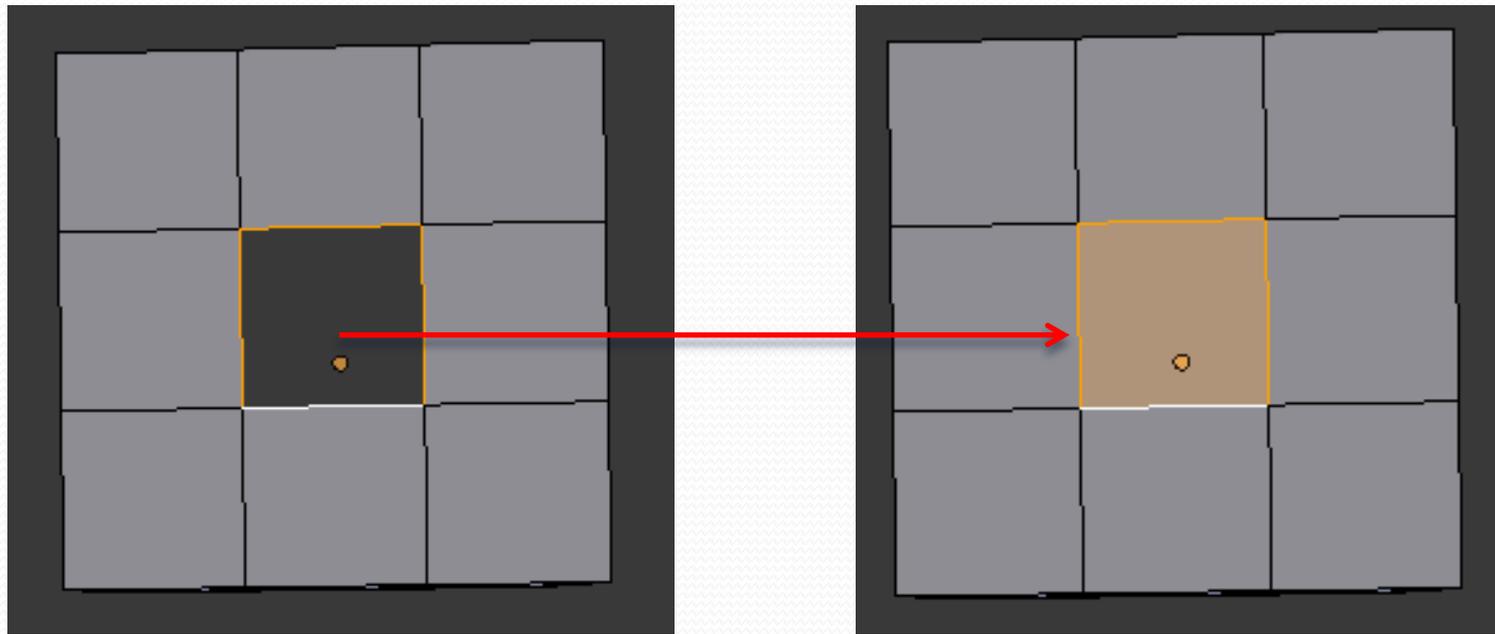
➤ Activity 2.10: Model a goblet (15 min)

- Using only extrude and scale options, model a goblet which looks like the following figure



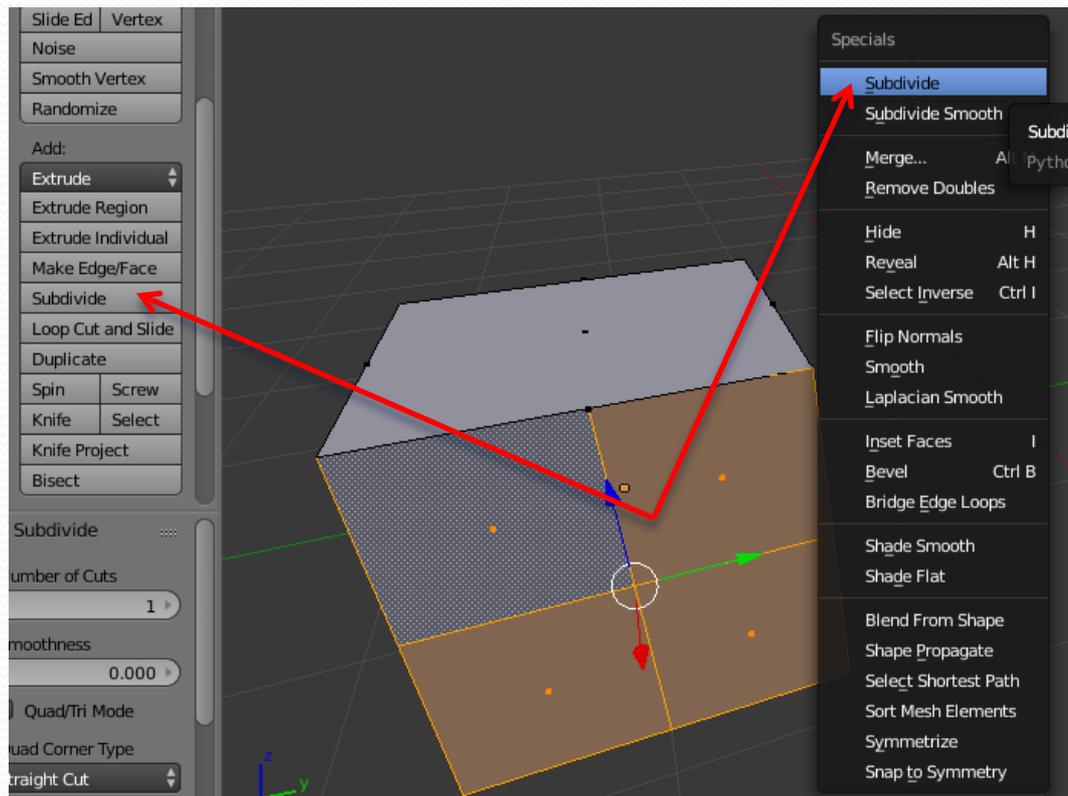
II. Edit mode

- **Fill** operation: creates a new face from selected vertices, using **F** key



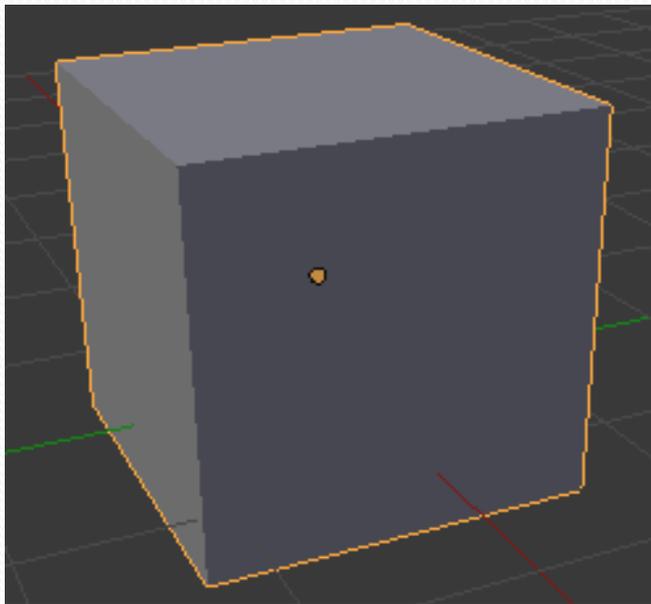
II. Edit mode

- Subdivision Tools:
 - **Subdivide**: allows **increasing the total number of polygons** in the mesh, it is available via the toolbar or by choosing **W key** > subdivide

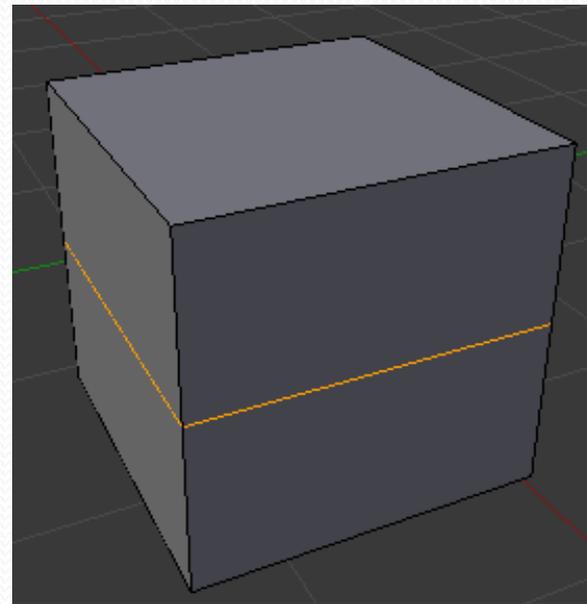


II. Edit mode

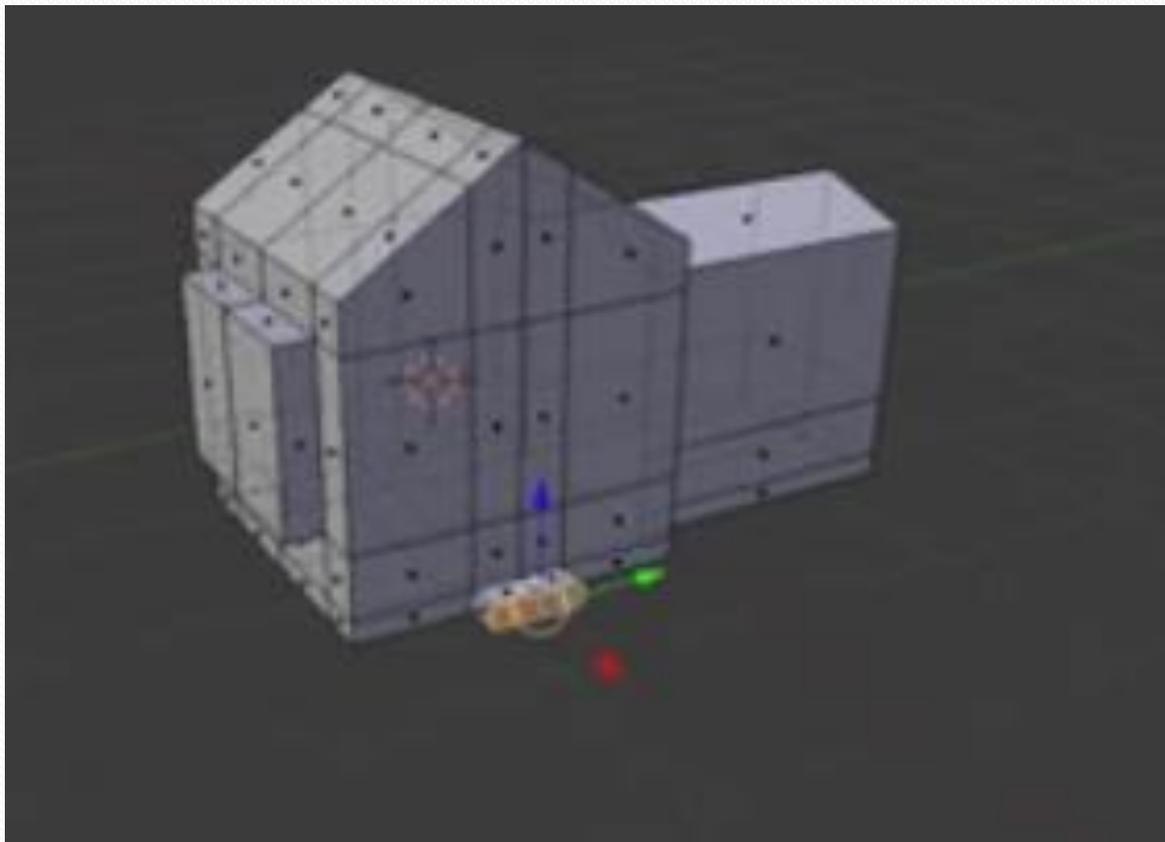
- Subdivision Tools:
 - **Loop subdivide**: splits a loop of faces by inserting a new edge loop intersecting the chosen edge (**Ctrl+R** key).



Mech before inserting edge loop

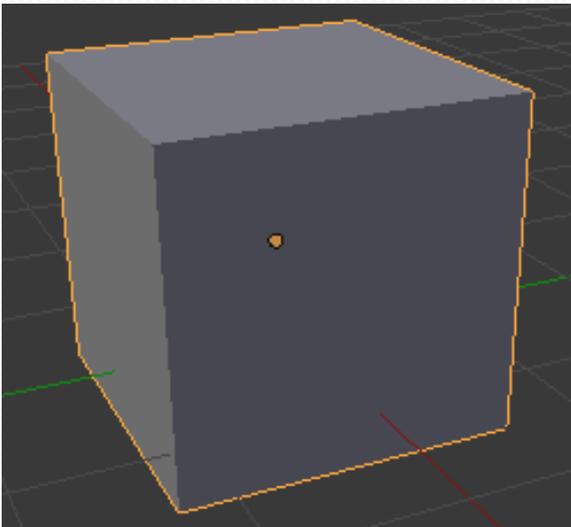


Interactive placement of edge loop between adjacent loops

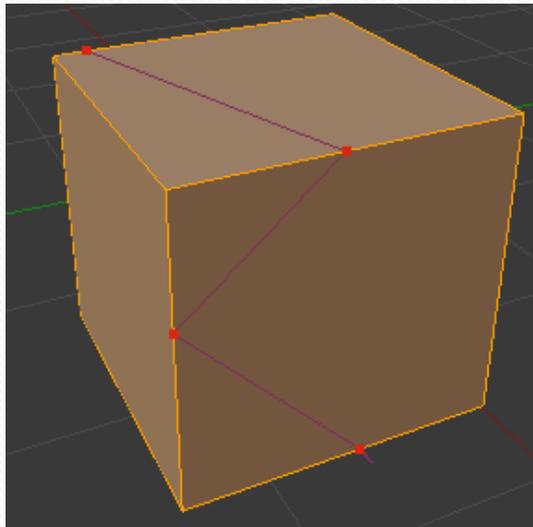


II. Edit mode

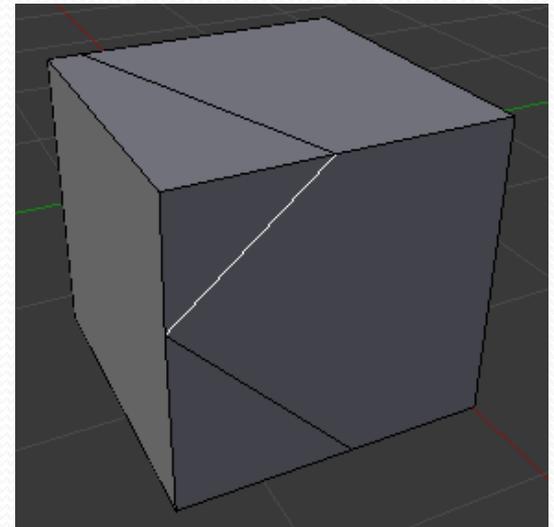
- Subdivision Tools:
 - **Knife tool**: allows to **split edges differently** than the subdivide command. It subdivides interactively edges and faces intersected by a user-drawn "knife" line. (**K key**).



Mech before knife cut



Knife cut active

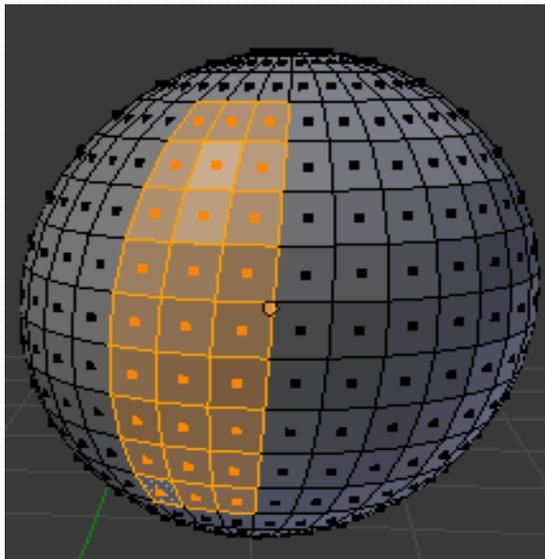


After confirming knife cut

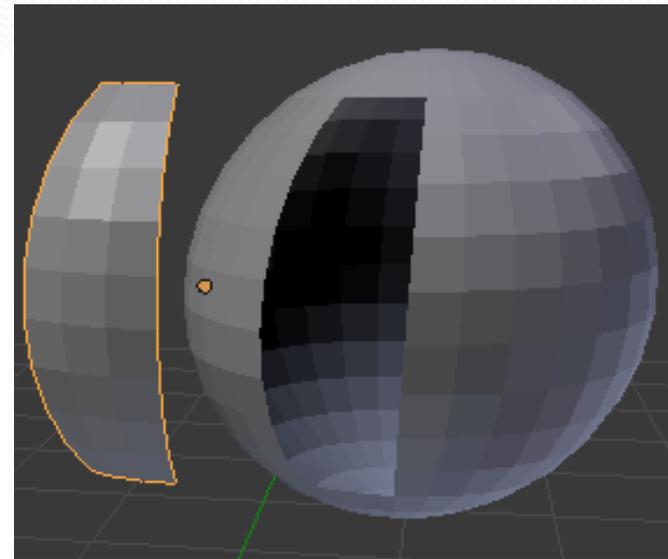
II. Edit mode

➤ Separating Meshes:

- you need to be in Edit mode
- **select the vertices** you wish to separate from the rest of the mesh
- type the **P key** and select your option



Selected Vertices

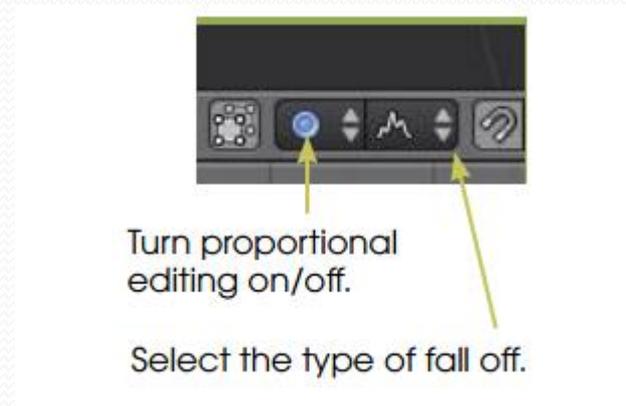
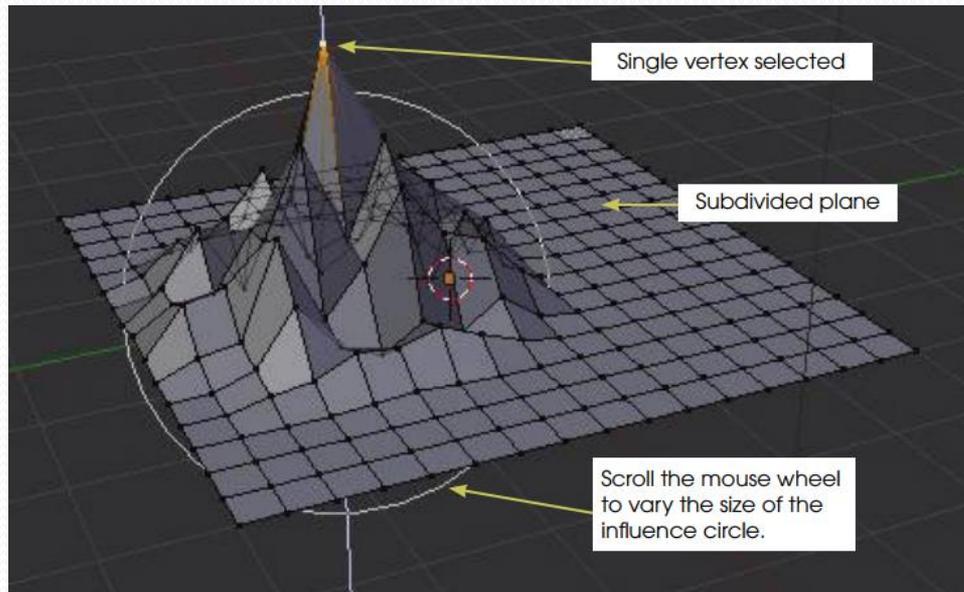


Separation : P key + By selection

II. Edit mode

➤ Proportional Vertex Editing:

- Create a flow in the shape when editing vertices
- Creating **Ground**
- Random, Linear, sharp, Constant, Smooth, etc.



Thank you for your attention!