5.2.5 Modeling - Meshes - Selecting

Selecting

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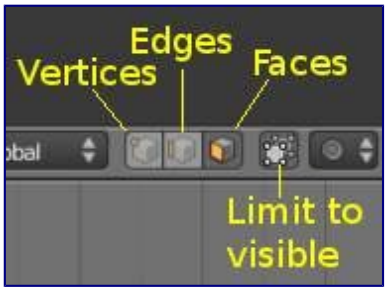
Selecting Mesh Components

There are many ways to select elements, and it depends on what *Mesh Select Mode* you are in as to what selection tools are available. First we will go through these modes and after that a look is taken at basic selection tools.

Selection Mode

Select Mode Header Widgets



Edit mode selection buttons

In *Edit mode* there are three different selection modes. You can enter the different modes by selecting one of the three buttons in the toolbar.

Vertices

In this mode vertices are drawn as points.

Selected vertices are drawn in orange, unselected vertices in black, and the active or last selected vertex in white.

Edges

In this mode the vertices are not drawn.

Instead the selected edges are drawn in orange, unselected edges black, and the active or last selected edge in white.

Faces

In this mode the faces are drawn with a selection point in the middle which is used for selecting a face.

Selected faces and their selection point are drawn in orange, unselected faces are drawn in black, and the

active or last selected face is highlighted in white.

When using these button, you can make use of modifier keys, see: Switching Select Mode.

Almost all tools are available in all three mesh selection modes. So you can *Rotate*, *Scale*, *Extrude*, etc. in all modes. Of course rotating and scaling a *single* vertex will not do anything useful *(without setting the pivot point to another location)*, so some tools are more or less applicable in some modes.

Select Mode Pop-up

Reference
Mode: *Edit* mode Hotkey: `Ctrl-Tab`

Mesh Select Mode menu

You can choose a selection mode with the pop-up menu:

Select Mode ‣ Vertices
Press `Ctrl-Tab` and select *Vertices* from the pop-up menu, or press `Ctrl-Tab1`.
Select Mode ‣ Edges
Press `Ctrl-Tab` and select *Edges* from the pop-up menu, or press `Ctrl-Tab2`.
Select Mode ‣ Faces
Press `Ctrl-Tab` and select *Faces* from the pop-up menu, or press `Ctrl-Tab3`.

When using this menu, you can make use of modifier keys, see: Switching Select Mode.

Switching Select Mode

When switching modes in an “ascendant” way (i.e. from simpler to more complex), from *Vertices* to *Edges* and from *Edges* to *Faces*, the selected parts will still be selected if they form a complete element in the new mode.

For example, if all four edges in a face are selected, switching from *Edges* mode to *Faces* mode will keep the face selected. All selected parts that do not form a complete set in the new mode will be unselected.

Hence, switching in a “descendant” way (i.e. from more complex to simpler), all elements defining the “high-level” element (like a face) will be selected (the four vertices or edges of a quadrangle, for example).

Multiple Selection Modes

By holding `Shift-LMB` when selecting a selection mode, you can enable multiple *Selection Modes* at once.

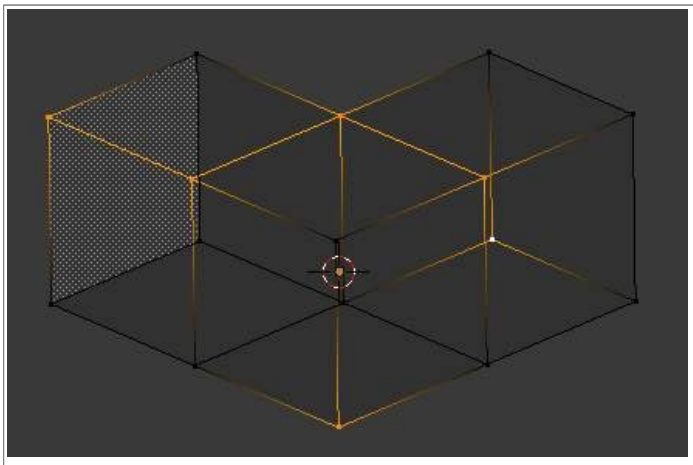
This allows you to quickly select Vertices/Edges/Faces, without first having to switch modes.

Expanding Selection Modes

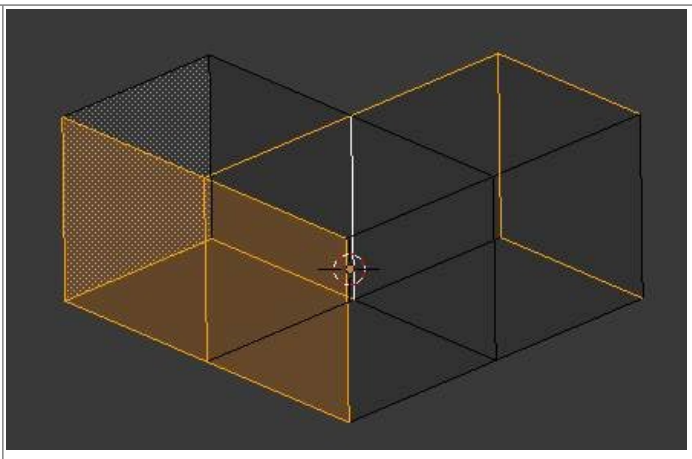
By holding `Ctrl` when selecting a higher selection mode, all elements touching the current selection will be

added, even if the selection does not form a complete higher element.

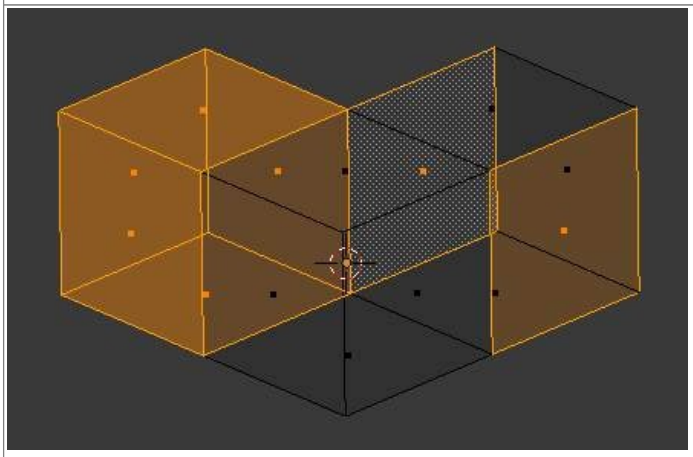
See (*Vertices mode example*), (*Edges mode example*), (*Faces mode example*) and (*Mixed mode example*) for examples of the different modes.



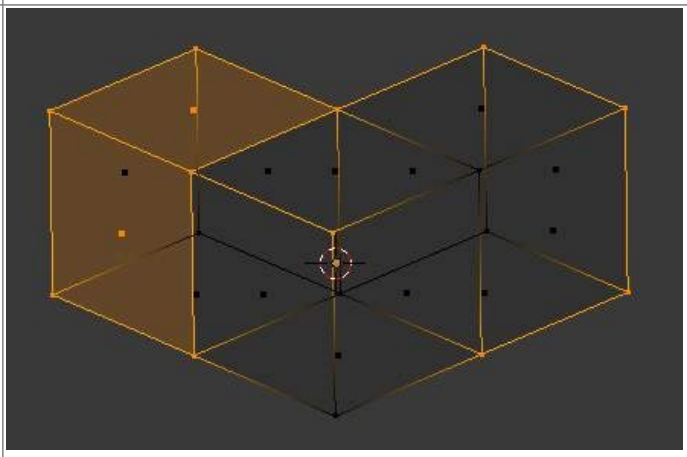
Vertices mode example.



Edges mode example.



Faces mode example.



Mixed mode example.

Selection Tools

The select menu in edit mode contains tools for selecting components. These are described in more detail in the following pages.

Border Select (`B`)
: Enables a rectangular region for selection

Circle Select (`C`)
: Enables a circular shaped region for selection

(De)select All `A`
: Select all or none of the mesh components.

Invert Selection (`Ctrl-I`)
: Selects all geometry that are not selected, and deselect currently selected components.

Select Random
: Selects a random group of vertices, edges, or faces, based on a percentage value.

Checker Deselect
: Deselect alternating faces, to create a checker like pattern.

Select Sharp Edges

This option will select all edges that are between two faces forming an angle less than a given value, which is asked you *via* a small pop-up dialog. The lower is this angle limit, the sharper will be the selected edges. At `180`, **all** manifold edges will be selected.

Linked Flat Faces (`Ctrl-Shift-Alt-F`)
Select connected faces based on a threshold of the angle between them. This is useful for selecting faces that are planar.

Interior Faces
Select faces where all edges have more than 2 faces.

Side of Active
Selects all data on the mesh in a single axis

Select Faces by Sides
Selects all faces that have a specified number of edges.

Non Manifold (`Ctrl-Shift-Alt-M`)
Selects non-manifold geometry. See *Mesh Advanced Selection*.

Loose
Select all vertices or edges that do not form part of a face.

Similar (`Shift-G`)

Select geometry based on how similar certain properties are to it.

Note

The items shown in the menu depend on the Selection Mode.

More `Ctrl-NumpadPlus`
Propagates selection by adding geometry that are adjacent to selected elements.

Less `Ctrl-NumpadMinus`
Deselects geometry that form the bounds of the current selection

Mirror
Select mesh items at the mirrored location.

Pick Linked (`L`)
Selects all geometry connected to the geometry under the cursor.

Linked (`Ctrl-L`)
Selects all geometry that are connected to the current selection.

Vertex Path
Selects a vertex path between two selected vertices

Edge Loop
Selects a loop of edges from a selected edge

Edge Ring
Selects edges parallel to a selected edge in the same ring of faces

Loop Inner-Region
Converts a closed selection of edges to the region of faces it encloses

Boundary Loop
Converts a selection of faces to the ring of edges enclosing it

Basic Selection

Reference
Mode: *Edit* mode

Hotkey: RMB and Shift-RMB

The most common way to select an element is to RMB on that item; this will replace the existing selection with the new item.

Adding to a Selection

To add to the existing selection, hold down Shift while right clicking. Clicking again on a selected item will deselect it.

As in *Object* mode, there is a unique *active* element, displayed in a lighter shade (in general, the last element selected). Depending on the tools used, this element might be very important!

Note that there is no option to choose what element to select between overlapping ones (like the Alt-RMB click in *Object* mode). However, if you are in solid, shaded, or textured viewport shading mode (not bounding box or wireframe), you will have a fourth button in the header that looks like a cube, just right of the select mode ones.

When enabled, this limits your ability to select based on visible elements (as if the object was solid), and prevents you from accidentally selecting, moving, deleting or otherwise working on backside or hidden items.

Selecting Elements in a Region

Reference

Mode: *Edit* mode
Hotkey: B, C, and Ctrl-LMB click and drag

Region selection allows you to select groups of elements within a 2D region in your 3D view. The region can be either a circle or rectangle. The circular region is only available in *Edit mode*. The rectangular region, or *Border Select, is available in both *Edit mode* and *Object* mode.

Note

What is selected using both these tools is affected by the *Limit Selection to visible* feature (available under the 3D viewport) in *Solid Viewport Shading Mode*.

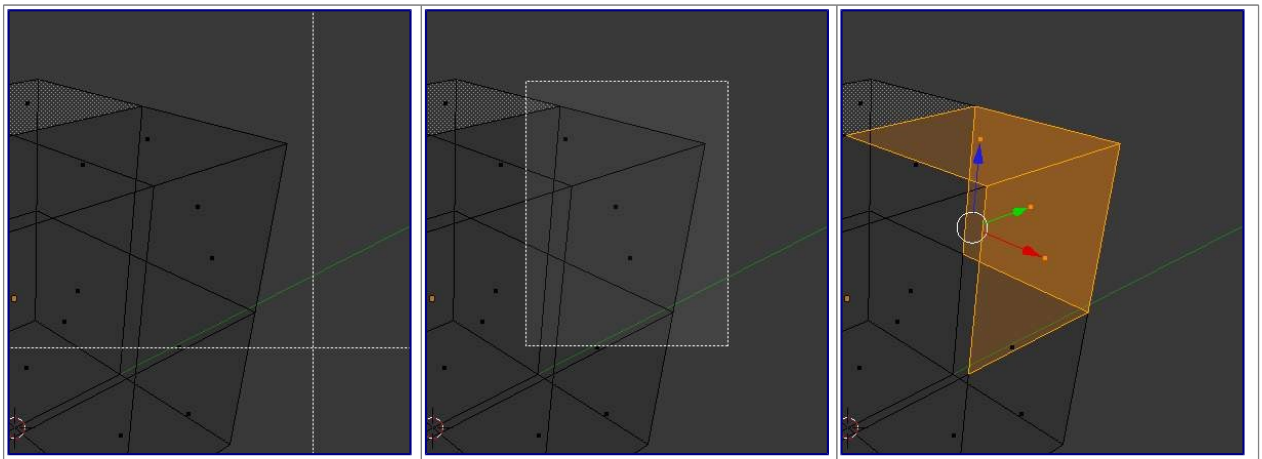
For example,

- in solid shading mode and face selection mode, all faces *within* the selection area will be selected;
- whilst in the wireframe shading mode and face selection mode, only faces whose handle are within the selection area will be selected.

Rectangular region (Border select)

Border Select is available in either *Edit mode* or *Object* mode. To activate the tool use the B. Use *Border Select*

to select a group of objects by drawing a rectangle while holding down LMB. In doing this you will select all objects that lie within or touch this rectangle. If any object that was last active appears in the group it will become selected *and* active.



Start | Selecting | Complete

In (*Start*), *Border Select* has been activated and is indicated by showing a dotted cross-hair cursor. In (*Selecting*), the *selection region* is being chosen by drawing a rectangle with the LMB. The selection area is only covering the selection handles of three faces. Finally, by releasing LMB the selection is complete; see (*Complete*).

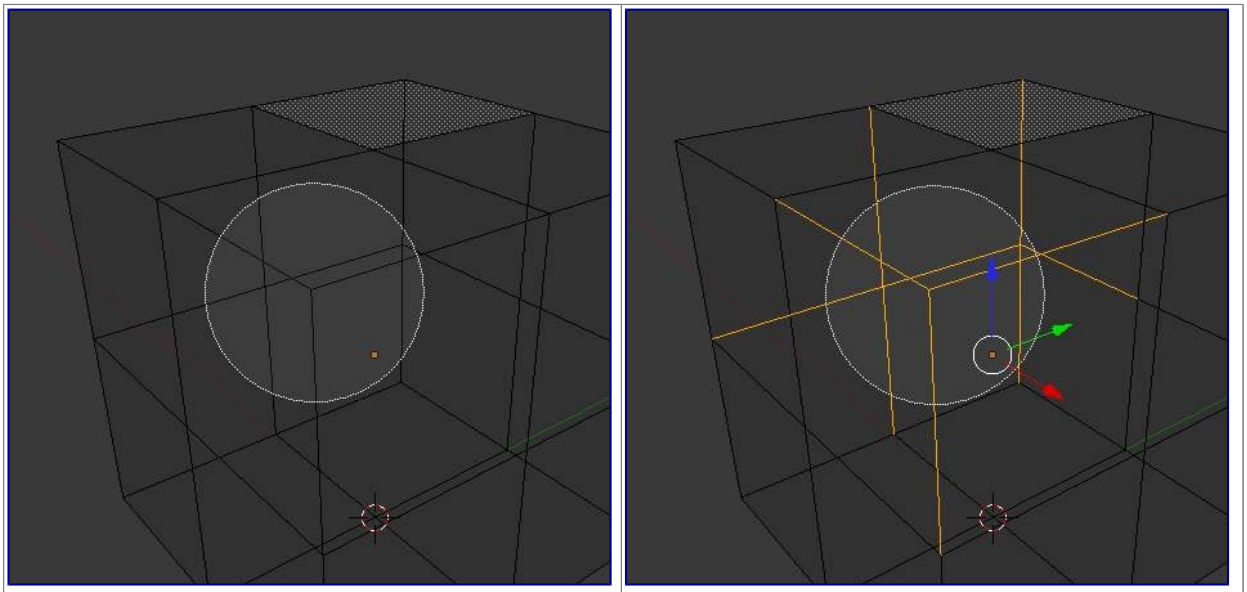
Reference
Border select adds to the previous selection, so in order to select only the contents of the rectangle, deselect all with A first. In addition, you can use MMB while you draw the border to deselect all objects within the rectangle.

Circular region

This selection tool is only available in *Edit mode* and can be activated with C. Once in this mode the cursor changes to a dashed cross-hair with a 2D circle surrounding it. The tool will operate on whatever the current select mode is. Clicking or dragging with the LMB, causing elements to be inside the circle will cause those elements to be selected.

You can enlarge or shrink the circle region using NumpadPlus and NumpadMinus, or the Wheel.

Circle Region Select



Before | After

(*Circle Region Select*) is an example of selecting edges while in *Edge Select Mode*. As soon as an edge intersects the circle the edge becomes selected. The tool is interactive such that edges are selected while the circle region is being dragged with the `LMB`.

If you want to deselect elements, hold `MMB` and begin clicking or dragging again.

For *Faces* select mode, the circle must intersect the face indicators usually represented by small pixel squares; one at the center of each face.

To exit from this tool, click `RMB`, or press the `Esc` key.

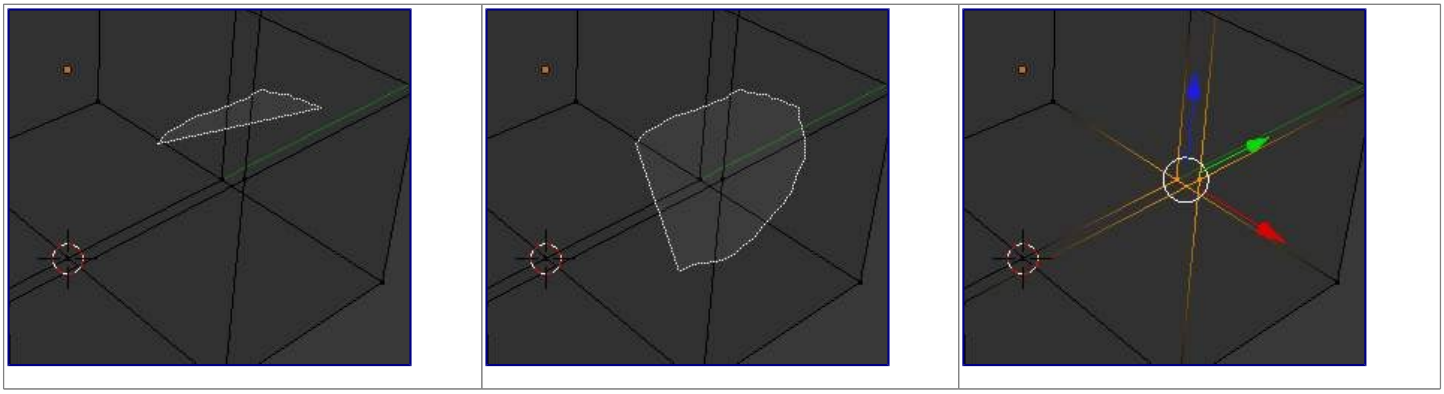
Lasso region

Lasso select is similar to *Border* select in that you select objects based on a region, except *Lasso* is a hand-drawn region that generally forms a circular/round-shaped form; kind of like a lasso.

Lasso is available in either *Edit Mode* or *Object Mode*. To activate the tool use the `Ctrl-LMB` while dragging. The one difference between *Lasso* and *Border* select is that in *Object mode*, *Lasso* only selects objects where the lasso region intersects the objects' center.

To deselect, use `Ctrl-Shift-LMB` while dragging.

Lasso selection



Start	Selecting	Complete

(*Lasso selection*) is an example of using the *Lasso* select tool in *Vertex Select Mode*.

Additional Selection Tools

The select menu in edit mode contains additional tool for selecting components:

(De)select All `A`
: Select all or none of the mesh components.

Invert Selection `Ctrl-I`
: Selects all components that are not selected, and deselect currently selected components.

More `Ctrl-NumpadPlus`
: Propagates selection by adding components that are adjacent to selected elements.

Less `Ctrl-NumpadMinus`
: Deselects components that form the bounds of the current selection

Advanced Selection

The select menu in edit mode contains additional tool for selecting components:

Mirror
: Select mesh items at the mirrored location.

Linked
: Selects all components that are connected to the current selection. (see Select Linked)

Random
: Selects a random group of vertices, edges, or faces, based on a percentage value.

Checker Deselect
: Deselect alternating faces, to create a checker like pattern.

Select Every N Number of Vertices
: Selects vertices that are multiples of N.

Sharp Edges
: This tool selects all edges between two faces forming an angle greater than the angle option, Where an increasing angle selects sharper edges.

Linked Flat Faces (`Ctrl-Shift-Alt-F`**)**
: Select connected faces based on a threshold of the angle between them. This is useful for selecting faces that are planar.

Non Manifold (`Ctrl-Shift-Alt-M`**)**

Selects the non-manifold geometry of a mesh. This entry is available when editing a mesh, in Vertex and Edge selection modes only. The *redo* panel provides several selection options:

Extend
: Lets you extend the current selection.

Wire
: Selects all the edges that don’t belong to any face.

Boundaries
: Selects edges in boundaries and holes.

Multiple Faces
: Selects edges that belong to 3 or more faces.

Non Contiguous
Selects edges that belong to exactly 2 faces with opposite normals.
Vertices
Selects vertices that belong to *wire* and *multiple face* edges, isolated vertices, and vertices that belong to non adjoining faces.

Interior Faces
Select faces where all edges have more than 2 faces.

Side of Active
Selects all data on the mesh in a single axis

Select Faces by Sides
Selects all faces that have a specified number of edges.

Loose Geometry
Select all vertices or edges that do not form part of a face.

Select Linked

Reference
Mode: *Edit* mode Menu: Select ‣ Linked Hotkey: `Ctrl-L`

Select parts of a mesh connected to already selected elements. This is often useful when a mesh has disconnected, overlapping parts, where isolating it any other way would be tedious.

To give more control, you can also enable delimiters so the selection is constrained by seans, sharp-edges, materials or UV islands.

Hint
You can also select linked data directly under the cursor, using the `L` shortcut to select or `Shift-L` to deselect linked. This works differently in that it uses the geometry under the cursor instead of the existing selection.

Select Similar

Reference
Mode: *Edit* mode Menu: Select ‣ Similar... Hotkey: `Shift-G`

Select components that have similar attributes to the ones selected, based on a threshold that can be set in tool properties after activating the tool. Tool options change depending on the selection mode:

Vertex Selection Mode:
Normal

Selects all vertices that have normals pointing in similar directions to those currently selected.

Amount of Adjacent Faces
Selects all vertices that have the same number of faces connected to them.

Vertex Groups
Selects all vertices in the same *vertex group*.

Amount of connecting edges
Selects all vertices that have the same number of edges connected to them.

Edge Selection Mode:

Length
Selects all edges that have a similar length as those already selected.

Direction
Selects all edges that have a similar direction (angle) as those already selected.

Amount of Faces Around an Edge
Selects all edges that belong to the same number of faces.

Face Angles
Selects all edges that are between two faces forming a similar angle, as with those already selected.

Crease
Selects all edges that have a similar *Crease* value as those already selected. The *Crease* value is a setting used by the *Subsurf Modifier.*

Bevel
Selects all edges that have the same *Bevel Weight* as those already selected.

Seam
Selects all edges that have the same *Seam* state as those already selected. *Seam* is a true/false setting used in UV-texturing.

Sharpness
Selects all edges that have the same *Sharp* state as those already selected. *Sharp* is a true/false setting (a flag) used by the *EdgeSplit Modifier.*

Face Selection Mode:

Material
Selects all faces that use the same material as those already selected.

Image
Selects all faces that use the same UV-texture as those already selected (see UV-texturing pages).

Area
Selects all faces that have a similar area as those already selected.

Polygon Sides
Selects all faces that have the same number of edges.

Perimeter
Selects all faces that have a similar perimeter as those already selected.

Normal
Selects all faces that have a similar normal as those selected. This is a way to select faces that have the same orientation (angle).

Co-planar
Selects all faces that are (nearly) in the same plane as those selected.

Selecting Loops

You can easily select loops of components:

Edge Loops and Vertex Loops

Reference

Mode: *Edit* mode –> *Vertex* or *Edge* select mode
Menu: Select ‣ Edge Loop or Mesh ‣ Edges ‣ Edge Loop
Hotkey: `Alt-RMB` or `Ctrl-E` –> Edge Loop

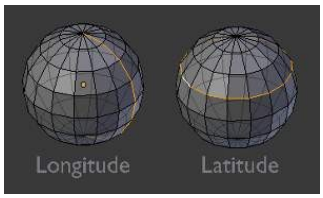
Holding `Alt` while selecting an edge selects a loop of edges that are connected in a line end to end, passing through the edge under the mouse pointer. Holding `Alt-Shift` while clicking adds to the current selection.

Edge loops can also be selected based on an existing edge selection, using either Select ‣ Edge Loop, or the *Edge Loop Select* option of the *Edge Specials* menu (`Ctrl-E`).

Note

Vertex mode

In *Vertex* select mode, you can also select edge loops, by using the same hotkeys, *and clicking on the edges* (not on the vertices).



Longitudinal and latitudinal edge loops.

The left sphere shows an edge that was selected longitudinally. Notice how the loop is open. This is because the algorithm hit the vertices at the poles and terminated because the vertices at the pole connect to more than four edges. However, the right sphere shows an edge that was selected latitudinally and has formed a closed loop. This is because the algorithm hit the first edge that it started with.

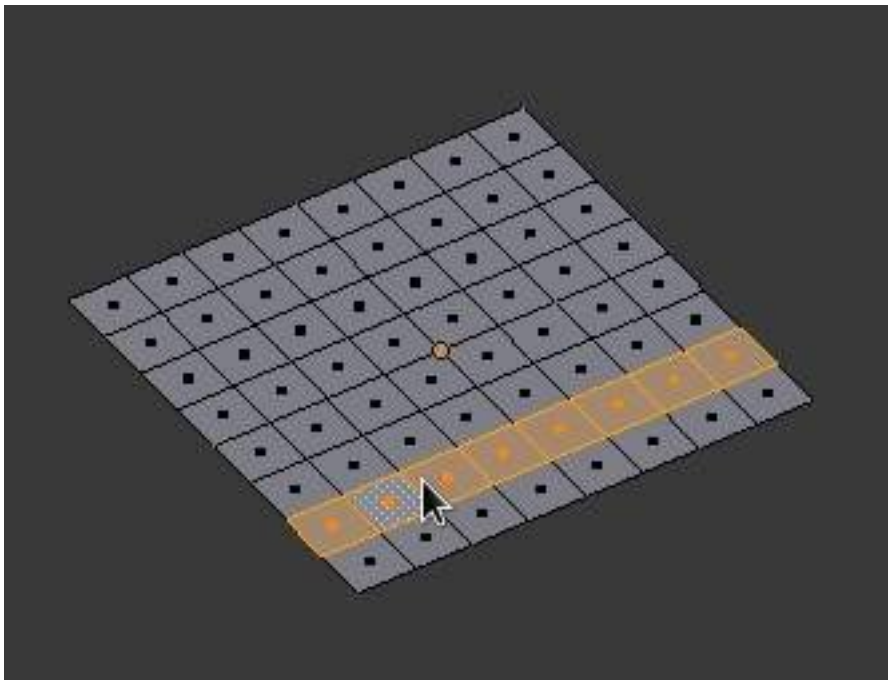
Face Loops

Reference

Mode: *Edit* mode –> *Face* or *Vertex* select modes
Hotkey: `Alt-RMB`

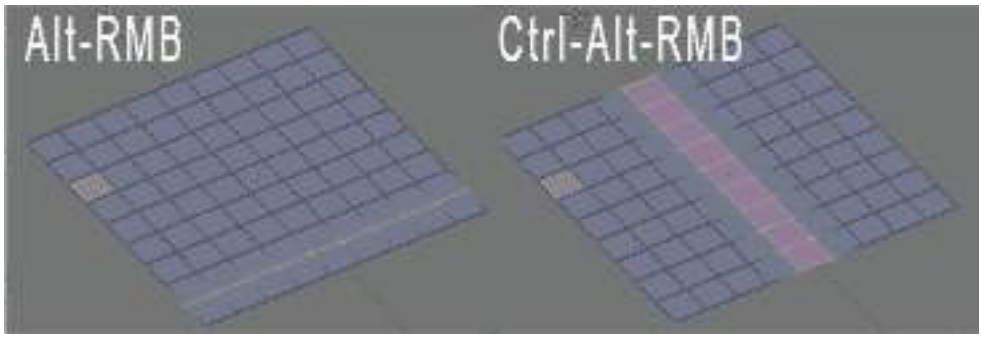
In face select mode, holding `Alt` while selecting an **edge** selects a loop of faces that are connected in a line end to end, along their opposite edges.

In vertex select mode, the same can be accomplished by using `Ctrl-Alt` to select an edge, which selects the face loop implicitly.



Face loop selection.

This face loop was selected by clicking with `Alt-RMB` on an edge, in *face* select mode. The loop extends perpendicular from the edge that was selected.



Alt versus Ctrl-Alt in vertex select mode.

A face loop can also be selected in *Vertex* select mode. Technically `Ctrl-Alt-RMB` will select an *Edge Ring*, however in *Vertex* select mode, selecting an *Edge Ring* implicitly selects a *Face Loop* since selecting opposite edges of a face implicitly selects the entire face.

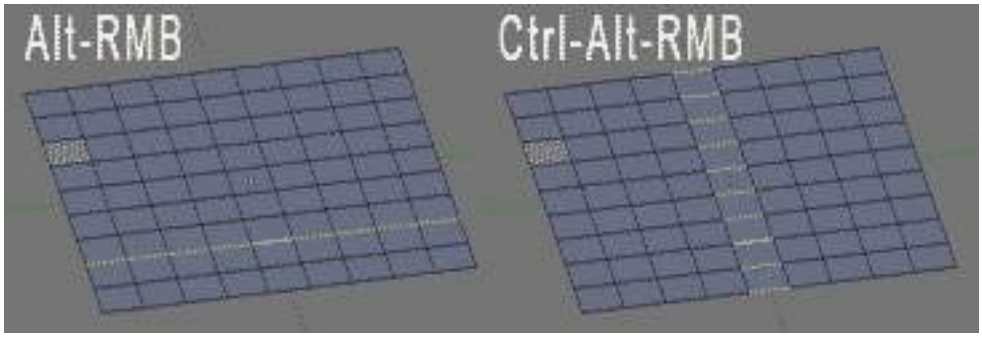
Edge Ring

Reference
Mode: *Edit* mode –> *Edge* select mode Menu: Select ‣ Edge Ring or Mesh ‣ Edges ‣ Edge Ring Hotkey: `Ctrl-Alt-RMB` or `Ctrl-E` –> Select ‣ Edge Ring

In *Edge* select mode, holding `Ctrl-Alt` while selecting an edge selects a sequence of edges that are not connected, but on opposite sides to each other continuing along a *face loop*.

As with edge loops, you can also select edge rings based on current selection, using either Select ‣ Edge Ring, or the *Edge Ring Select* option of the *Edge Specials* menu (`Ctrl-E`).

Note
Vertex mode In *Vertex* select mode, you can use the same hotkeys when *clicking on the edges* (not on the vertices), but this will directly select the corresponding face loop...

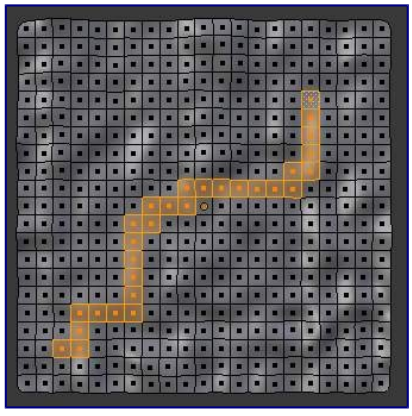


A selected edge loop, and a selected edge ring.

In (*A selected edge loop, and a selected edge ring*), the same edge was clicked on but two different “groups of edges” were selected, based on the different commands. One is based on edges during computation and the other is based on faces.

Path Selection

Reference
Mode: *Edit* mode Hotkey: `Ctrl-RMB` and the menu item Select –> *Shortest Path*



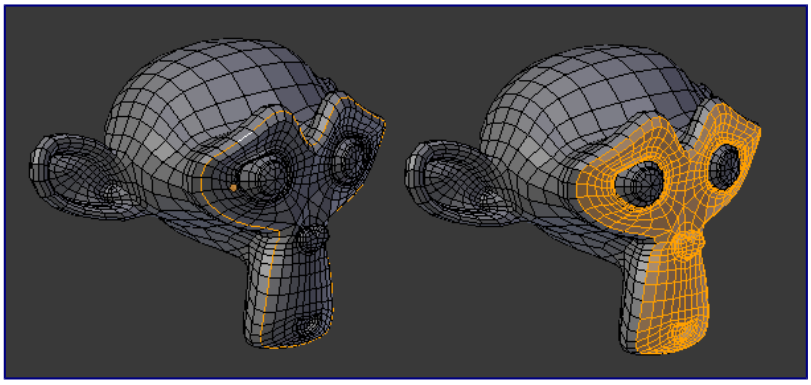
Select a face or vertex path with Ctrl-RMB

Selects all geometry along the shortest path from the active vertex/edge/face to the one which was selected.

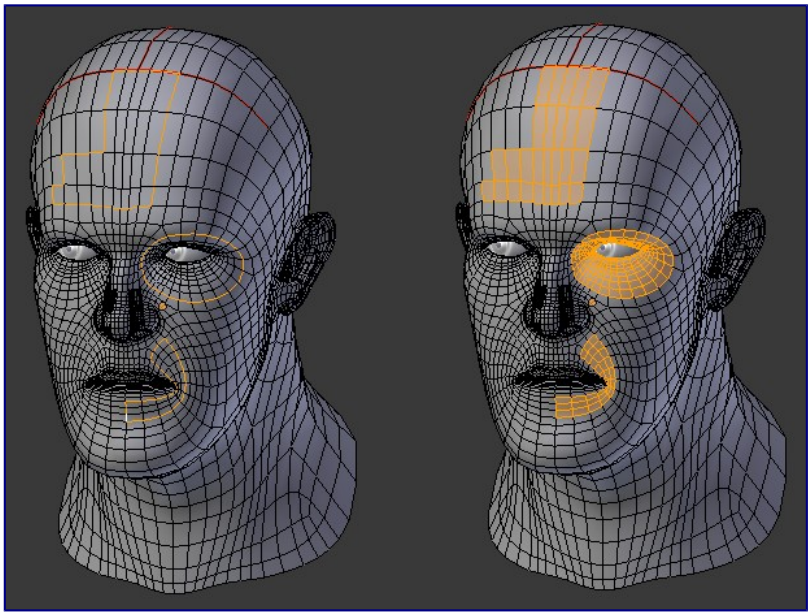
Loop Inner-Region

Reference
Mode: *Edit* mode –> *Edge* select mode Menu: Select ‣ Select Loop Inner-Region or Mesh ‣ Edges ‣ Select Loop Inner-Region Hotkey: `Ctrl-E` –> Select Loop Inner-Region

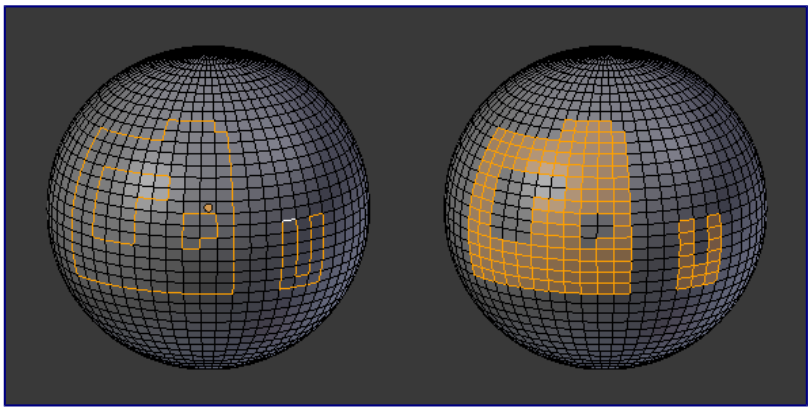
Select Loop Inner-Region selects all edges that are inside a closed loop of edges. While it is possible to use this operator in *Vertex* and *Face* selection modes, results may be unexpected. Note that if the selected loop of edges is not closed, then all connected edges on the mesh will be considered inside the loop.



Loop to Region.



This tool handles multiple loops fine, as you can see.



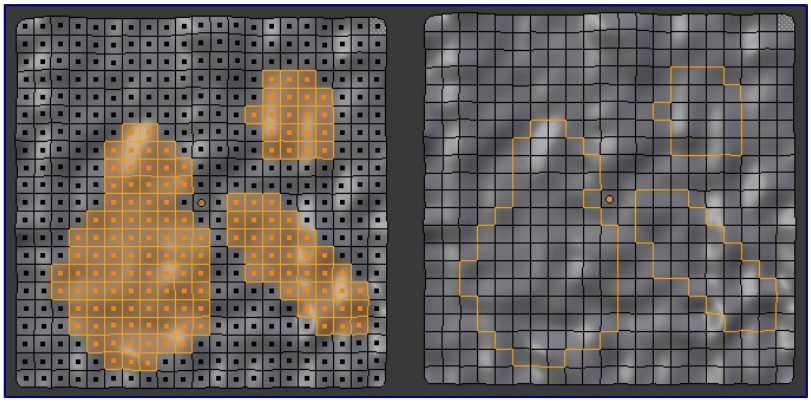
This tool handles “holes” just fine as well.

Boundary Loop

Reference
Mode: *Edit* mode –> *Edge* select mode Menu: Select ‣ Select Boundary Loop or Mesh ‣ Edges ‣ Select Boundary Loop Hotkey: `Ctrl-E` –> Select Boundary Loop

Select Boundary Loop does the opposite of *Select Loop Inner-Region*, based on all regions currently selected, it selects only the edges at the border of these regions. It can operate in any select mode, but will always switch to *Edge* select mode when run.

All this is much more simple to illustrates with examples:



Select Boundary Loop does the opposite and forces into Edge Select Mode

Selecting Edges

Buttons for the selection modes

Edges can be selected in much the same way as vertices and faces - by right-clicking them while Edge Select

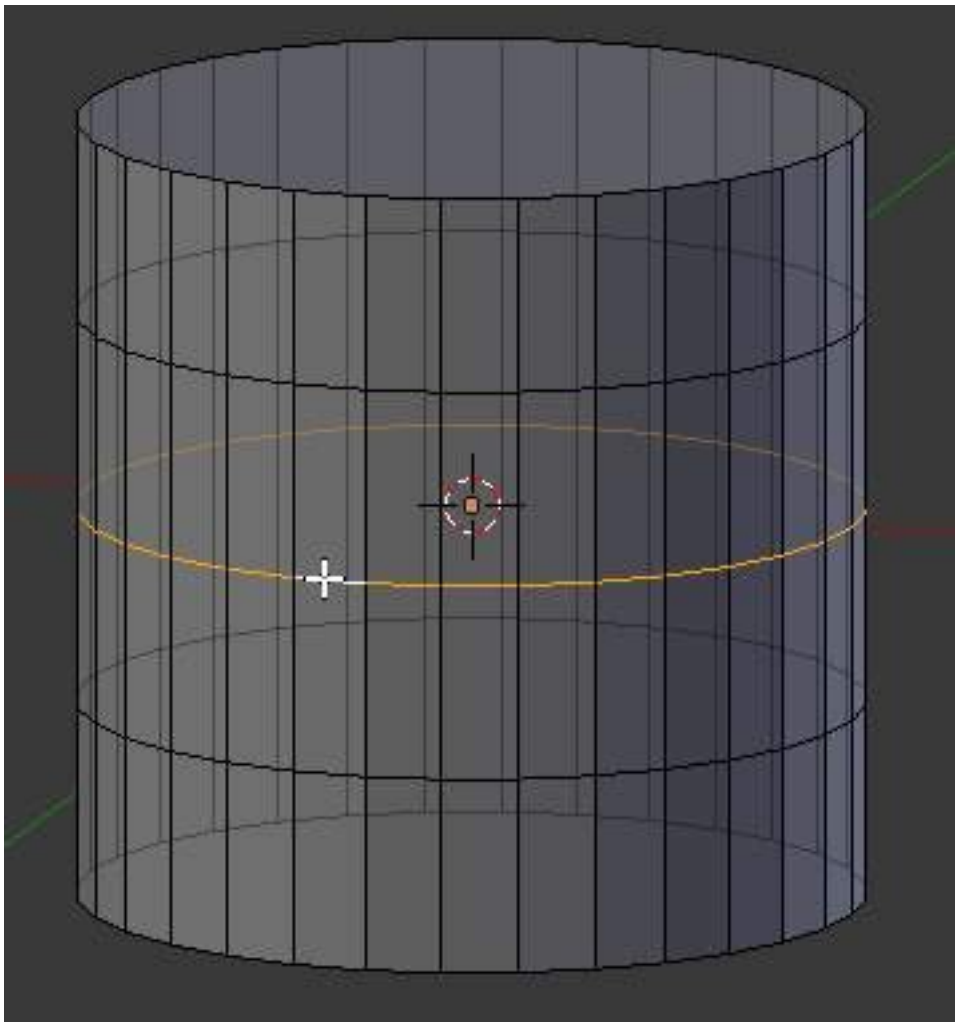
Mode is activated. Pressing `Shift` while clicking will add/subtract to the existing selection.

Edge Loops

Reference
Mode: Edit Mode (Mesh) Menu: Select ‣ Edge Loop Hotkey: `Alt-RMB` - or `Shift-Alt-RMB` for modifying existing selection

Edge loops can be selected by first selecting an edge (vertex or edge selection mode), and then going to Select ‣ Edge Loop. The shortcut `Alt-RMB` on an edge (either vertex or edge select mode) is a quicker and more powerful way of doing so. More powerful, because you can add/remove loops from an existing selection if you press `Shift` too.

Note, that if you want to select a loop while being in vertex select mode, you still have to perform the shortcut on an edge - while you, for just selecting vertices, would rightclick on a vertex.



An edge loop

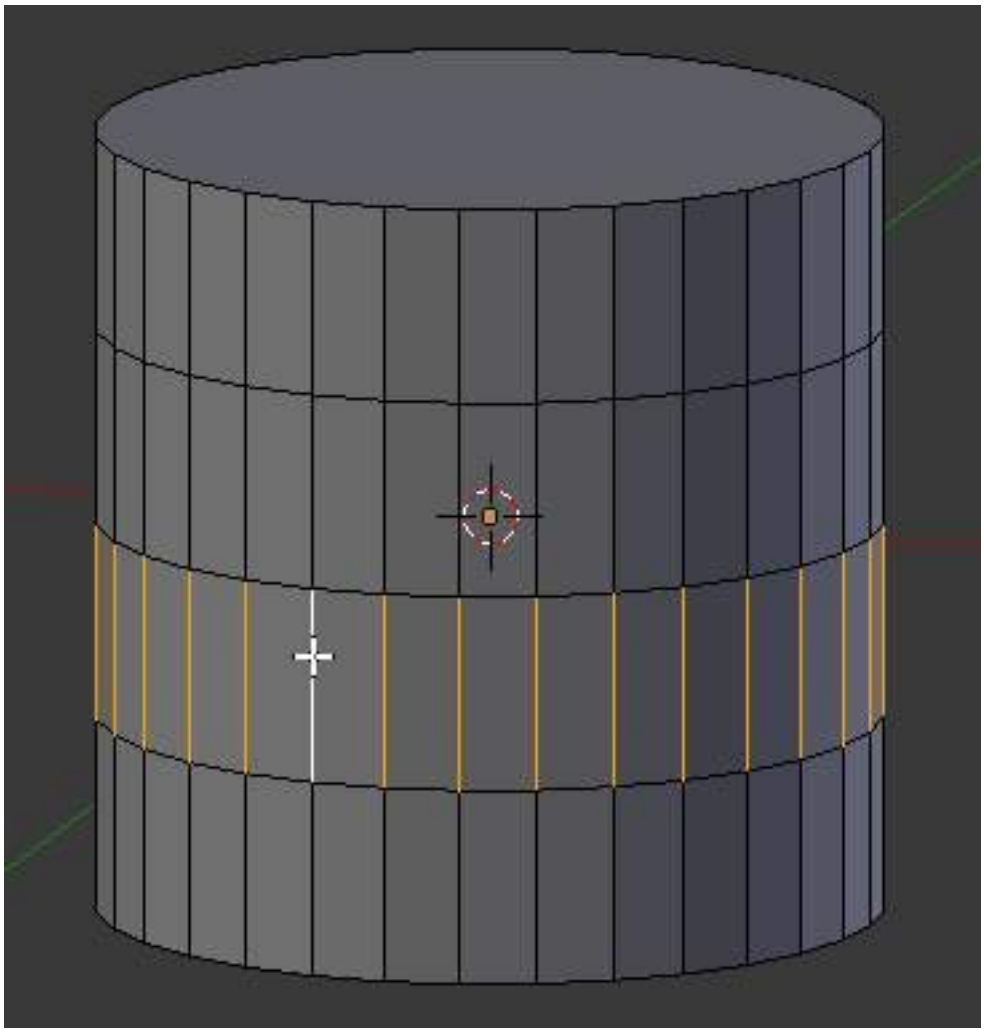
Note
`Alt` on Linux

`Alt` is on some Linux distros caught by the windows manager. If you see the above shortcut not working, make sure that blender can properly recognize the usage of `Alt`.

Edge Rings

Reference
Mode: Edit Mode (Mesh) Menu: Select ‣ Edge Ring Hotkey: `Alt-Ctrl-RMB` - or `Shift-Alt-Ctrl-RMB` for modifying existing selection

Edge Rings are selected similarly. Based on the selection of an edge go to Select ‣ Edge Ring. Or use `Alt-Ctrl-RMB` on an edge.



An Edge Ring

Note

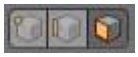
Convert selection to whole faces

If the edge ring selection happened in Edge Select Mode, switching to Face Select Mode will erase the selection.

This is because none of those faces had all its (four) edges selected, just two of them.

Instead of selecting the missing edges manually or by using `Shift-Alt-RMB` twice, it is easier to first switch to Vertex Select Mode, which will kind of “flood” the selection. A subsequent switch to Face Select Mode will then properly select the faces.

Selecting Faces



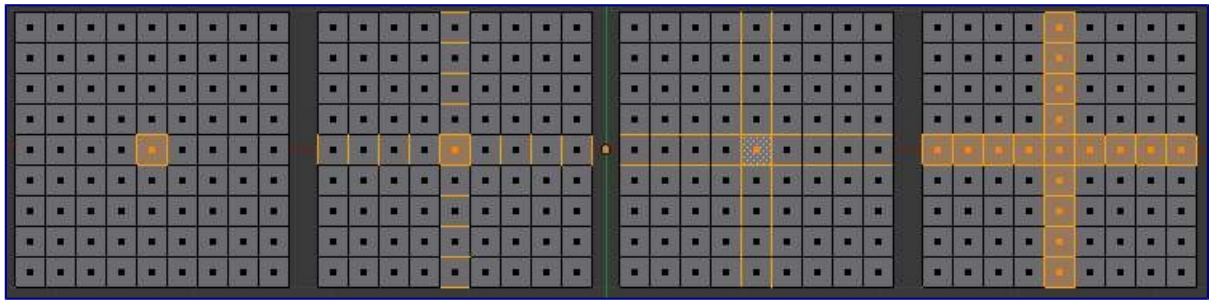
Activated the Face Select Mode

To select parts of a mesh face-wise, you have to switch to Face Select Mode. Do this by clicking the button shown above, or press `Ctrl-Tab` to spawn a menu. The selection works as usual with `RMB` ; to add/remove to an existing selection, additionally press `Shift`

Face Loops

Reference
Mode: Edit Mode (Mesh) Hotkey: `Alt-RMB` - or `Shift-Alt-RMB` for modifying existing selection

Face Loops are pretty much the same as Edge Rings. If you want to select a Face Loop, there is no menu entry that works based on a selected face. Using Select ‣ Edge Ring would select a “cross” with the prior selected face as the middle. If you want to avoid switching to Edge Select Mode to select a Face Loop, use the `Alt-RMB` shortcut.

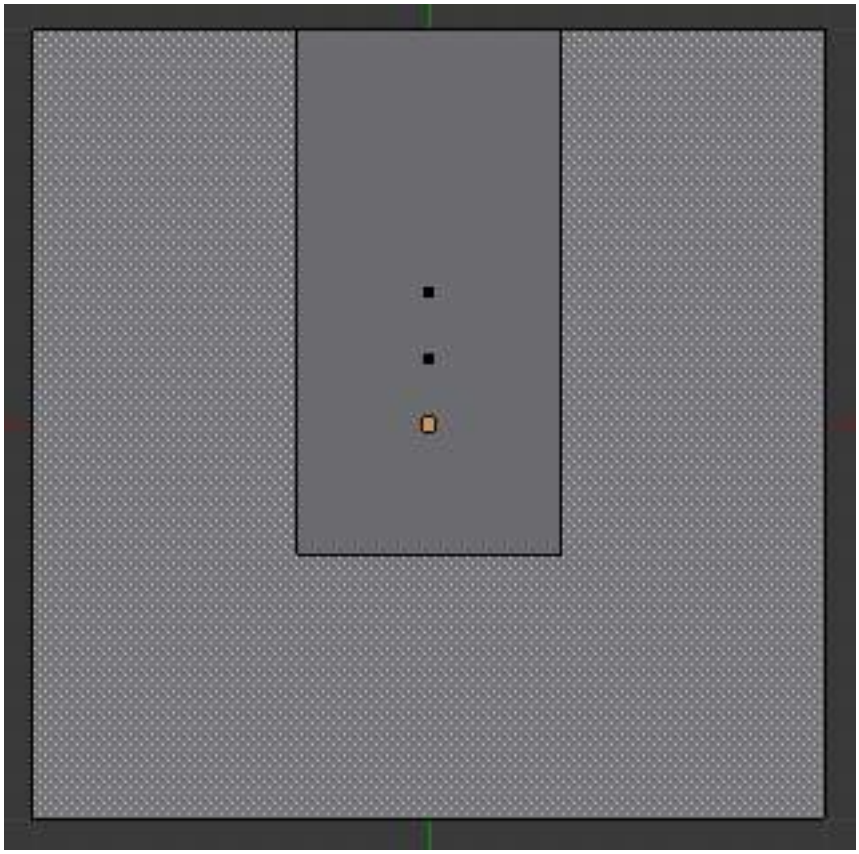


Different Loopselect Operations on a grid in Face Select Mode

- Just the selected face.
- Select the face, then Select ‣ Edge Ring. See, how Blender selects edges, even if being in Face Select Mode. If these edges are desired and you want to work on them, switch in Edge Select Mode. Switching to Vertex Select Mode would flood the selection and leave you with the 4th image as result, after going back to Face Select Mode.
- Select the face, the Select ‣ Edge Loop. As in the example above, Blender pretends to be in Edge Select Mode and takes the four edges of the selected face as base for the selection operation.

- This selection was created by `Alt-RMB` on the left edge of the center face, followed by twice `Shift-Alt-RMB` on the top edge of the center face. Two times, because the first click will remove the selected face loop (in this case, just the original selected face), while the second click will add the whole vertical running loop to the selection, creating the cross.

Ngons in Face Select Mode



Ngon-Face having its center dot inside another face

As already known, faces are marked with a little square dot in the middle of the face. With ngons that can lead in certain cases to a confusing display. The example shows the center dot of the U-shaped ngon being inside of the oblong face inside the “U”. It is not easy to say which dot belongs to which face (the orange dot in the image is the object center). Luckily, you don’t need to care much - because to select a face, you don’t have to click the center dot, but the face itself.

Tip
Face selection *To select a face:* Click the face, not the dot!