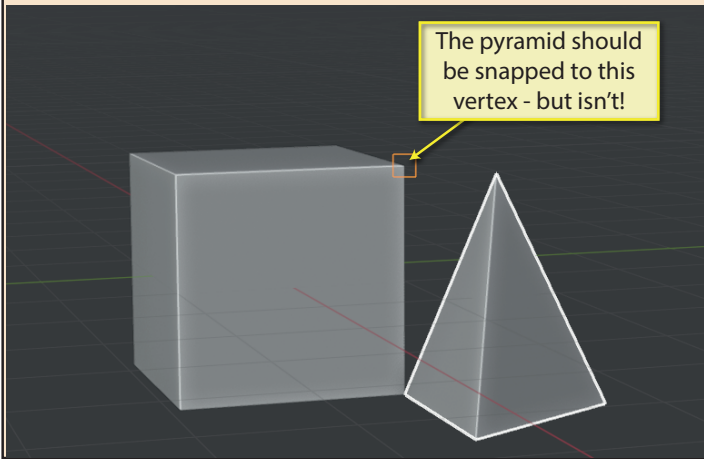After selecting the pyramid, and pressing **G**, as we move over the target object only the vertices of the Cube will be selectable. When the object being moved isn't box shaped, the result we get after pressing the left mouse button may be unexpected.

The pyramid should be snapped to this vertex - but isn't!

To understand what has happened, we need to know about bounding boxes. A **bounding box** is the smallest box shape that can enclose an object. If we make the pyramid's bounding box visible, we can see what has happened during snapping.

A vertex on the bounding box has snapped to the Cube
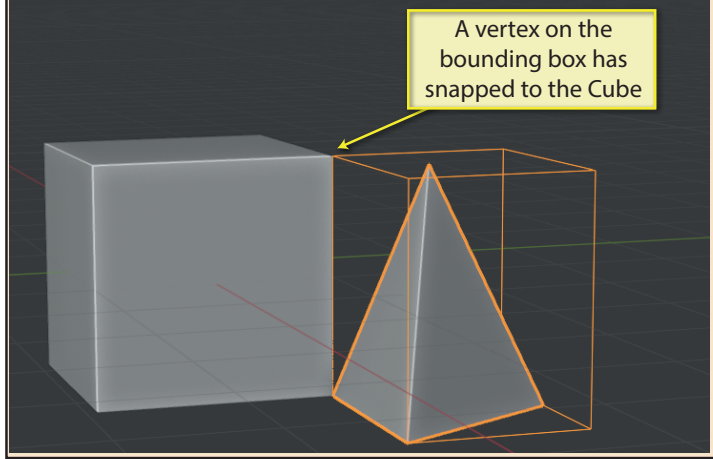
NOTE

If we try to use the **B** key with *Snap To* set to anything other than *Increment*, only the type specified in *Snap To* can be selected in the moving and target objects.

For the moment, we'll turn our attention to the **Snap With** option. **Center** snaps the moving object's origin to the selected target.

Snap With
Center
Snap To
Vertex

Pyramid's origin on Cube's vertex
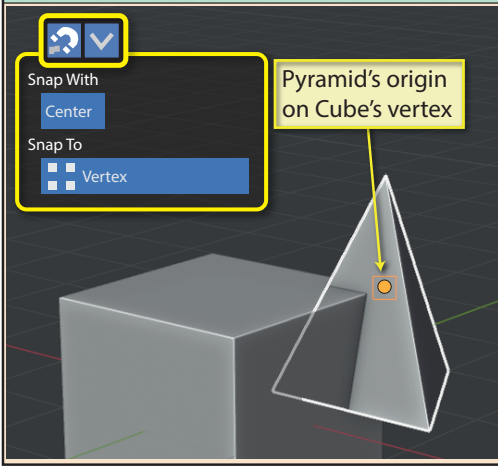
Snap With: Median is only useful when moving more than one object. This option snaps the midpoint between the origins of the moving objects to the destintion. The objects retain their relative distances from each other.

Snap With
Median
Snap To
Vertex

Midpoint of pyramid and UVSphere snapped to Cube's vertex
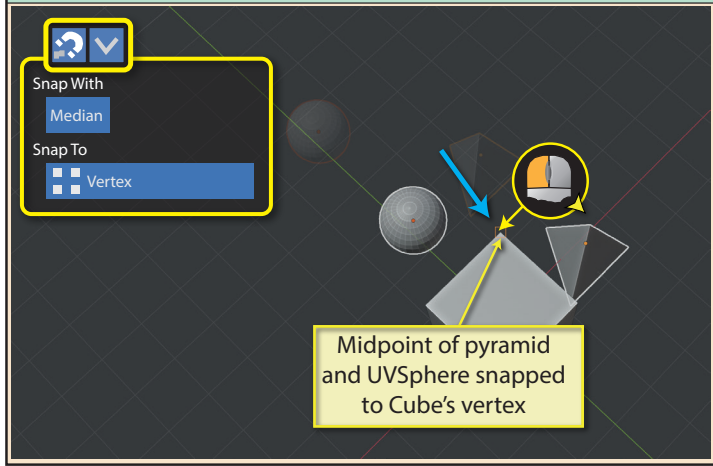
Snap With: Active snaps the origin of the active object to the target. Again, the objects retain their relative distances from each other.

Snap With
Active
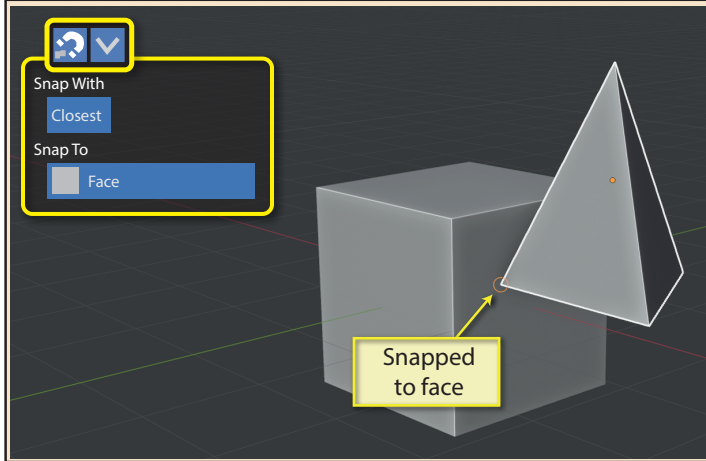Snap To
Vertex

Pyramid is the active object
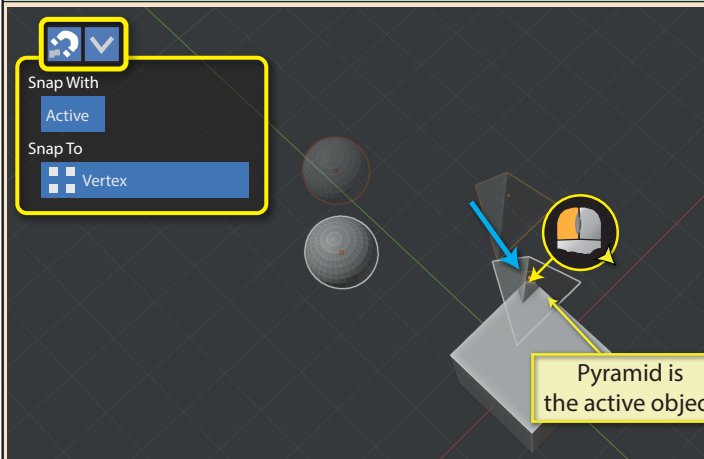
Now, we'll return **Snap With** to *Closest* and examine the rest of the **Snap To** options.
Snap To: Edge allows snapping only to edges on the target object.

Snap With
Closest
Snap To
Edge

Snapped to Cube's edge
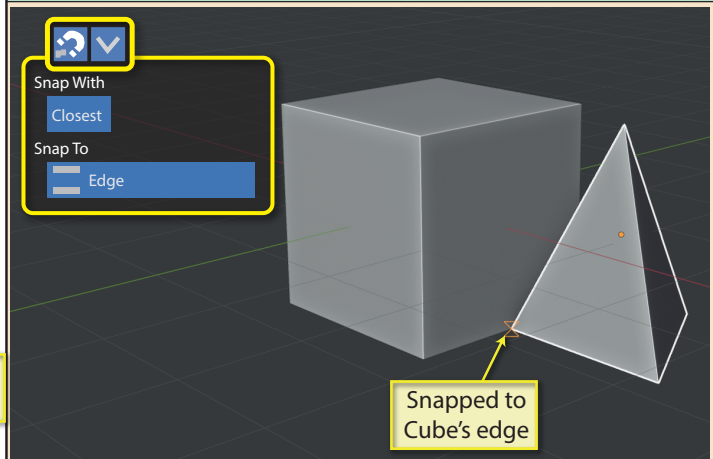
Snap To : Face allows us to snap the moving object anywhere on the face of the target.

Snap To: Volume snaps to anwhere within the volume of the target.

Snap With
Closest
Snap To
Face

Snapped to face

Snap With
Closest
Snap To
Volume

Snapped inside Cube
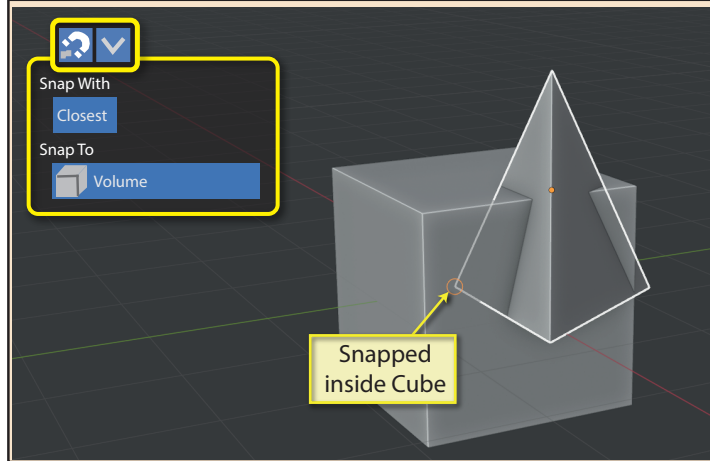
Blender calculates where within the volume of the target object the element of the moving object is to be placed by creating an imaginary line through the volume aligned to our viewpoint. It determines the coordinates of the line's entry point and exit point and places the moving element at that position.

To demonstrate, we'll change **Snap With** to *Center* and place a small sphere within the Cube.

Snap With
Center
Snap To
Volume

Sphere's centre snapped to Cube's volume
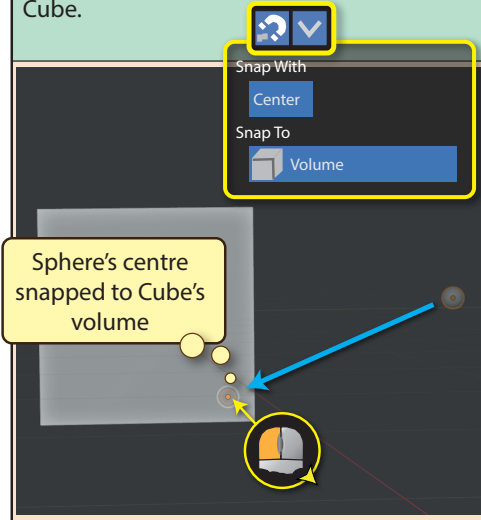
If we now change our viewpoint a draw in our own version of the imaginary line, we can see that the sphere is placed at its centre.

Sphere

Entry point

Mid point

Exit point
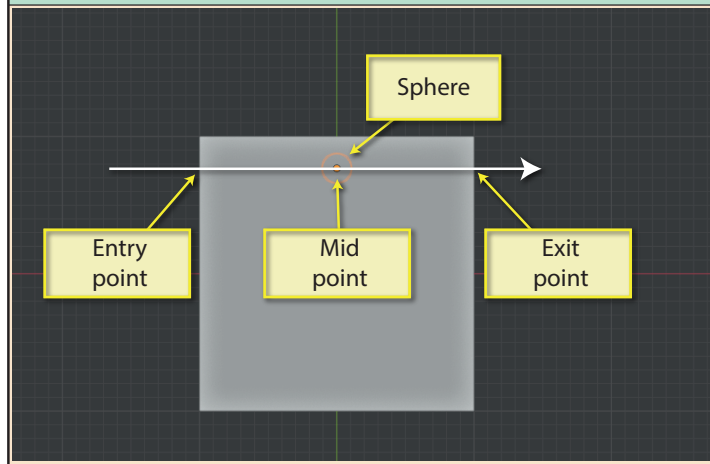
But if we try the same thing with a Torus rather than a Cube, we get an unexpected. result. The sphere ends up inside the first part of the Torus and not in the centre as we might expect. The reason for this is that Blender calculates the snap position by using the imaginary line's coordinates of the FIRST entry point and FIRST exit point.

Sphere's location

First exit point

First entry point

Blender Basics: Meshes in Object Mode
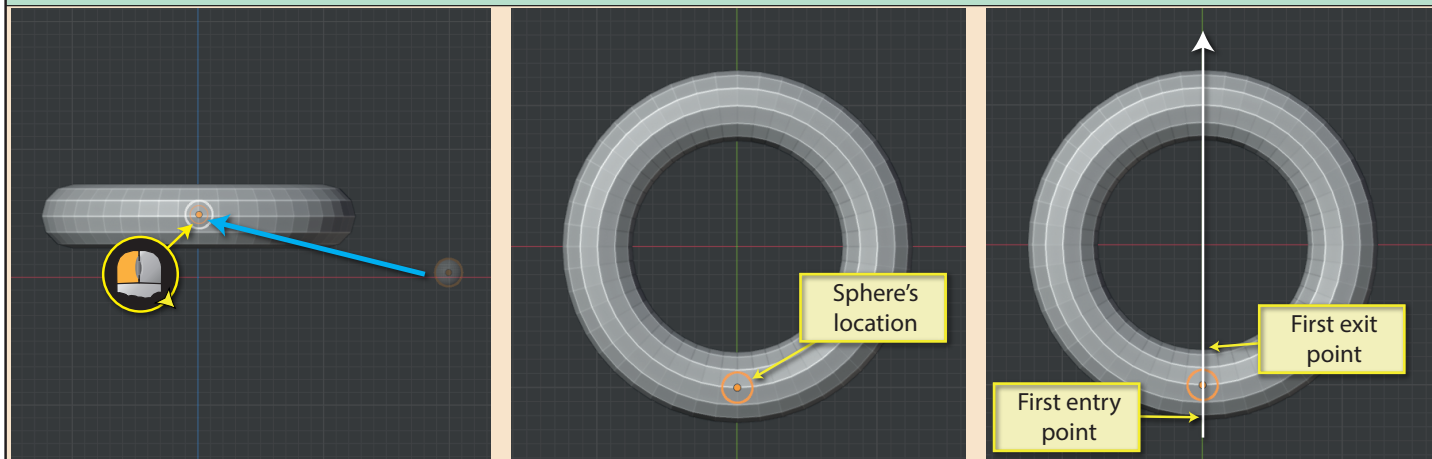
If we look back at the snapping parameter's panel, we see that when **Snap To: Volume** is selected, a new checkbox appears labelled as **Snap Peel Object**.

When this option is checked, Blender uses the first entry point and LAST exit point when calculating the position of the moving object.
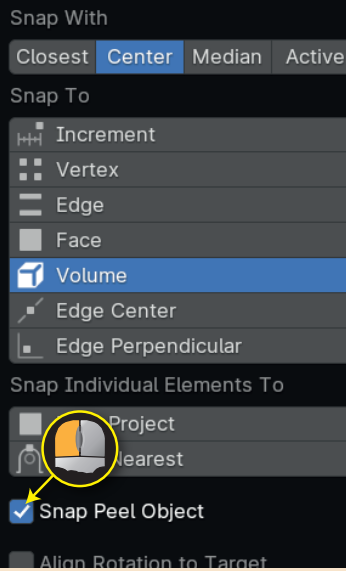

When we repeat the previous operation with **Snap Peel Object** checked, our sphere now ends up at the centre of the Torus.


Last exit point

Sphere's location

First entry point
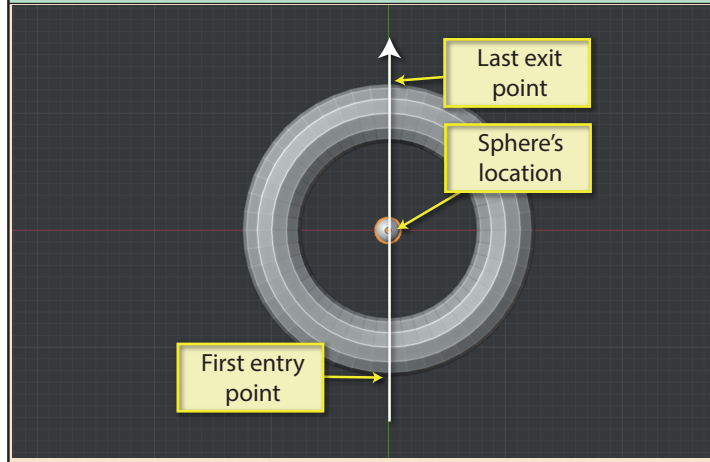
Snap To: Edge Center snaps the moving element to the exact centre of an edge.


Sphere's centre at centre of an edge on the Cube
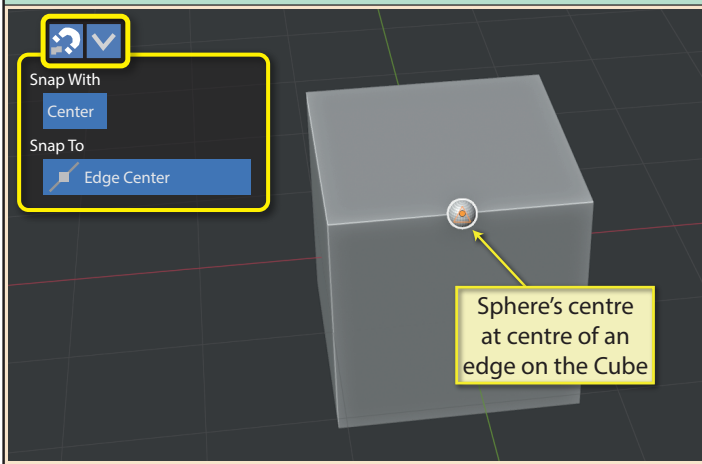
Snap To: Edge Perpendicular snaps the moving object in such away as to create a 90° angle between te selected edge on the Cube and the original position of the element being moved. Below we see the result from Top view.

Starting position
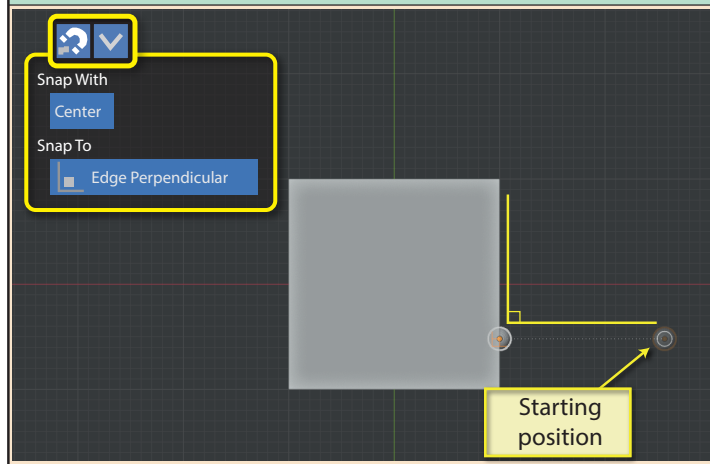
We can select more than one option in the **Snap To** list by holding down the **Shift** key as we click on the second and subsequent choices. We can then select any of the corresponding elements on the target object.
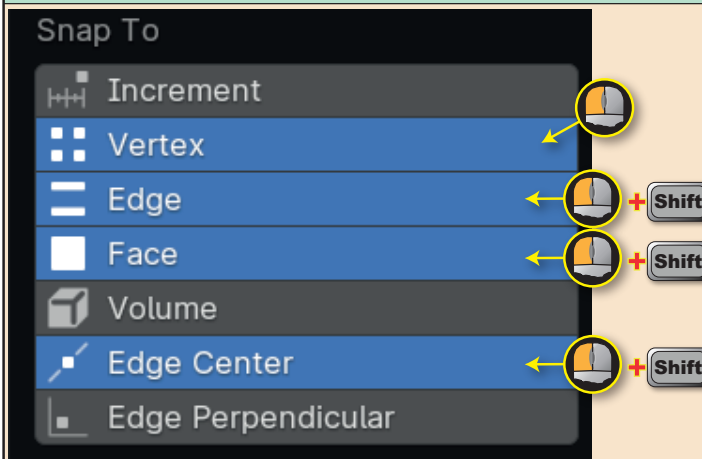
Below the *Snap To* options is the heading **Snap Individual Elements To**. The options under this heading are most useful when working in *Edit mode* but also operate in *Object mode*. To demostrate, we'll start with a UVSphere and a set of small Cubes.
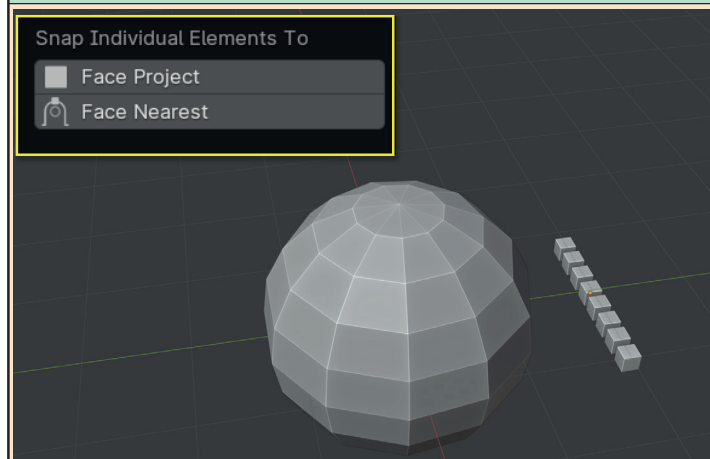
**Snap Individual Elements To: Face Project**, projects each element onto the nearest face visible from the current viewpoint. With all the Cubes selected, when we drag them to the sphere, each Cube snaps to the face closest to it giving the result we see below.
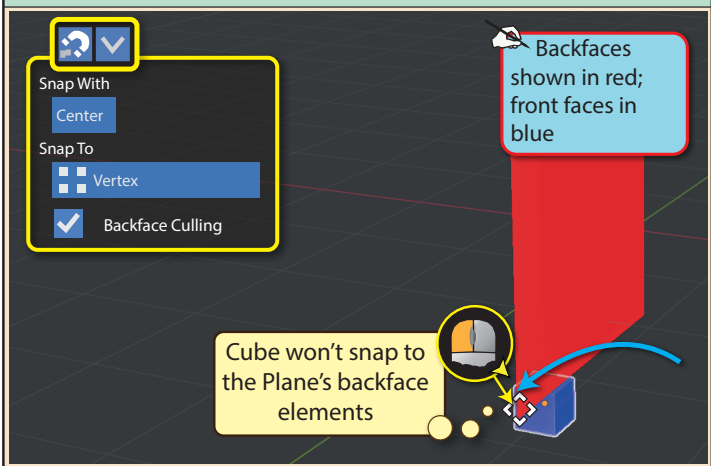
Snap With
Center

Snap Individual Elements To
Face Project
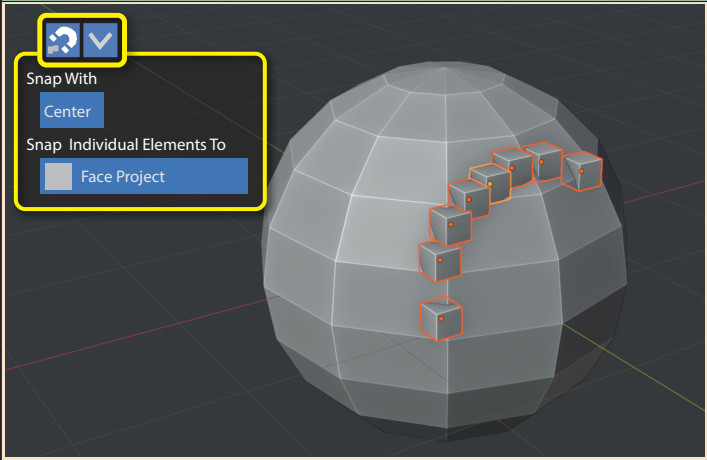
Snap Individual Elements To: Face Nearest snaps the moving objects to the nearest face irrespective of its visibility from the current viewpoint. In other words, it may project the objects onto hidden faces.

View during operation

Adjusted view

Snap With
Center

Snap Individual Elements To
Face Nearest

Some Cubes on hidden faces
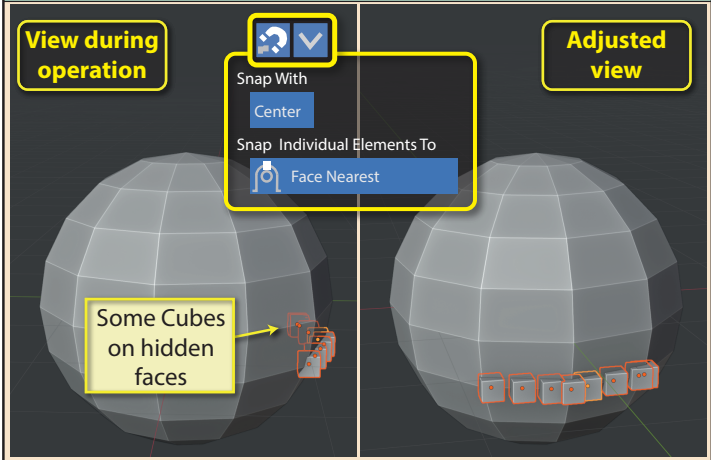
The checkbox, **Align Rotation to Target**, when selected, adjusts the orientation of the moving object so that its z-axis aligns with the normal in the area where it is snapped to. Below the pyramid has adjusted itself to sit on the face of a sphere.

Snap With
Closest

Snap To
Face

☑ Align Rotation to Target
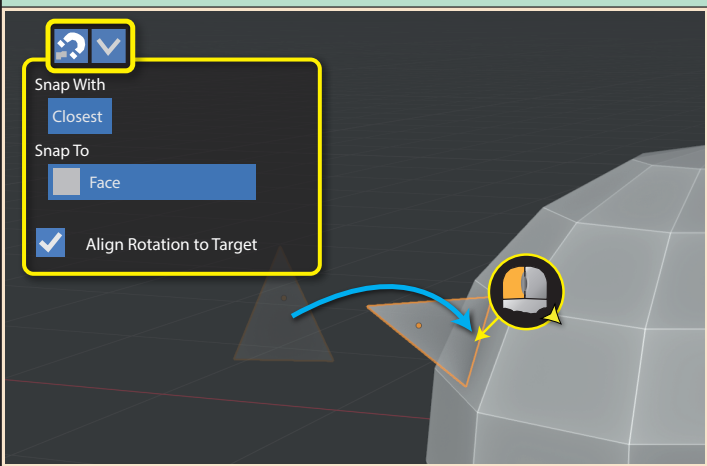
Backface Culling is the next checkbox in the Snapping panel. If we check this box, snapping cannot occur when the target is a vertex, edge or face of a backface.

Snap With
Center

Snap To
Vertex

☑ Backface Culling

Backfaces shown in red; front faces in blue

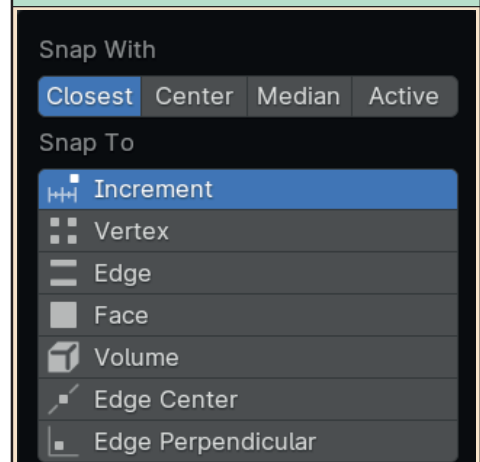Cube won't snap to the Plane's backface elements

Moving down the *Snapping panel*, we come to **Target Selection** with its one option, **Exclude Non-Selectables**. When selected (it will show in blue) the moving object cannot be snapped to an unselectable object.

Snap With
Center

Snap To
Vertex

Target Selection
▼ Exclude Non-Selectable

Non-selectable

Selectable

Sphere won't snap to Cube
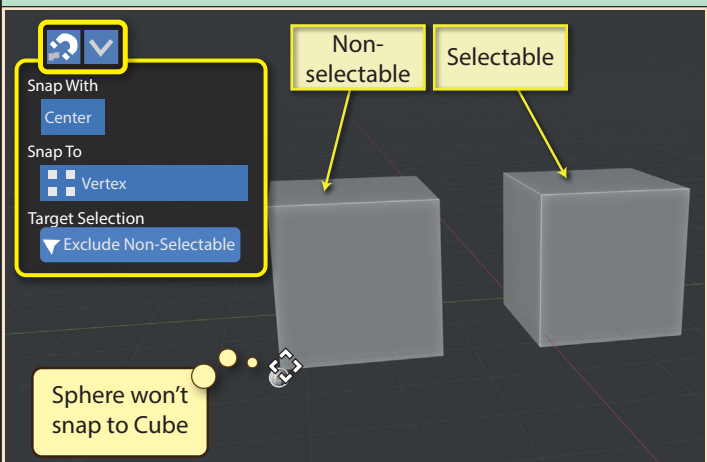
Snapping has one more powerful feature which allows us to select multiple points and have Blender use the average of those locations as either the *Snap With* or the *Snap To* points.

To start, we'll return the **Snap With** and **Snap To** settings to their default values.

Snap With

Closest	Center	Median	Active

Snap To

Increment
Vertex
Edge
Face
Volume
Edge Center
Edge Perpendicular

After pressing **G** to start a move and **B** to select a snapping point, we move the mouse pointer to the first *Snap With* point and press the **A** key - not the left mouse button.

| G | Grab | 1 |

| B | Begin selection | 2 |

Move to first snapping point | 3

| A | Mark location | 4
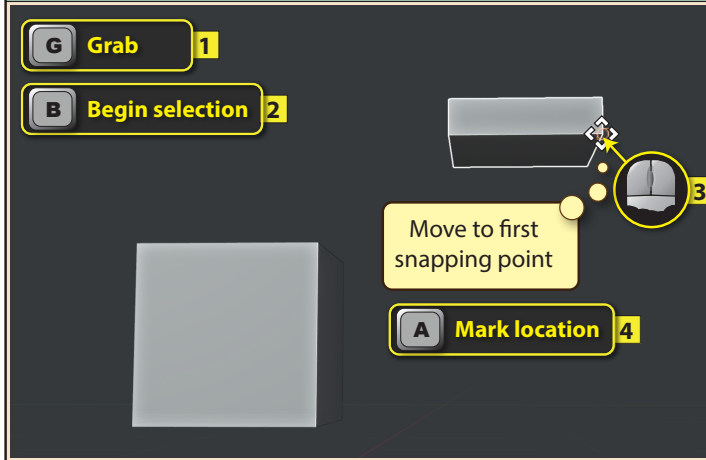
We can move to multiple locations, pressing **A** each time. For the final location we press the left mouse button. In this example, only two locations are used. By marking the diagonally opposite corner, Blender will calculate the *Snap With* mark as the centre of the face.

Midpoint calculated | 2

| 1
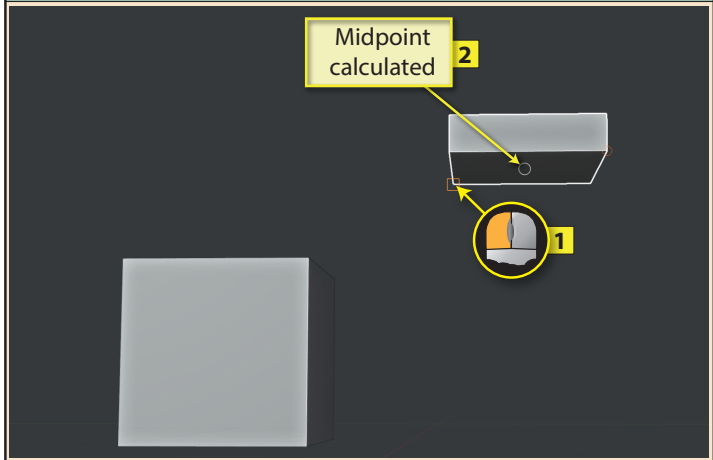
We want to place the smaller box on top of the Cube, so we will change viewpoint by holding down the **Alt** key while we drag using the middle mouse button.

Alt ➕
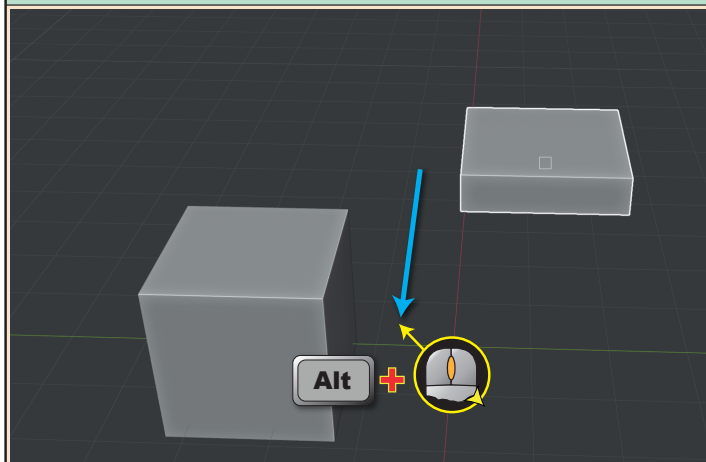
After changing viewpoint, and releasing the **Alt** and middle mouse button, the smaller box will move in response to the mouse. When over the first corner of the Cube we press **A** again and the left mouse button on the diagonally opposite point.

Snap To point is centre of Cube's top face | 4

| 1

| A | Mark location | 2

| 3
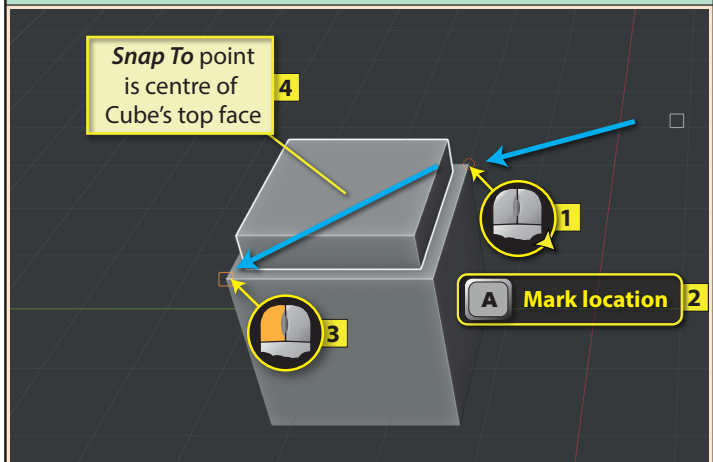
The **A** key can be used without the **B** key - and the marked points don't have to be on a single target object. In this example, we'll place a small sphere at the centre of a gap between two Cubes. We'll set the **Snap With** to *Center* and the **Snap To** to *Vertex*.

Snap With
Center
Snap To
Vertex
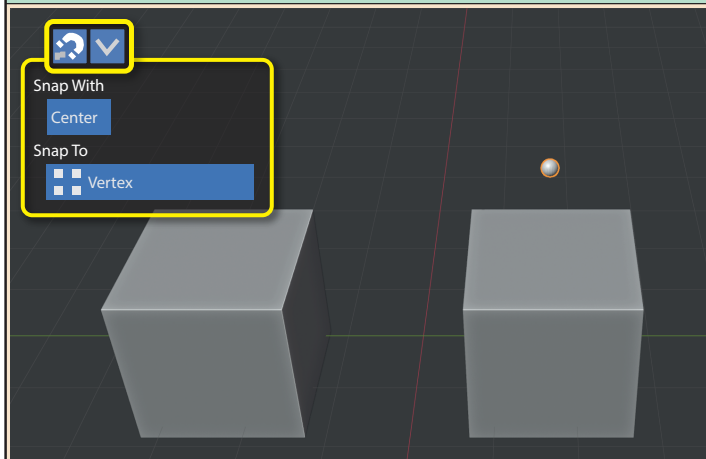
After selecting the sphere, we press **G** to start the move then mark one corner of the first Cube by pressing **A** and the opposite corner of the second Cube by pressing the left mouse button. The sphere is then cetred in the gap between the Cubes.

| G | Grab | 1

| 2

| A | Mark location | 3

| 4

Sphere centred in gap | 5